NORTH BAY WATER REUSE PROGRAM PHASE 2

Draft Environmental Impact Report/ Draft Environmental Impact Statement SCH No. 2017072051

Prepared for

U.S. Bureau of Reclamation

North Bay Water Reuse Authority

April 2018

Member and Contributing Agencies

DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT for the North Bay Water Recycling Program Phase 2

This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been prepared by Member Agencies of the North Bay Water Reuse Authority (NBWRA)[1] and the Bureau of Reclamation in accordance with the requirements of the California Environmental Quality Act (CEQA)[2] and the National Environmental Policy Act (NEPA)[3] for Phase 2 of the North San Pablo Bay Restoration and Reuse Project or the North Bay Water Recycling Program (Phase 2 Project). Napa County and North Marin Water District are additional agencies supporting the NBWRA through contribution of funds and staff time.

NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." This Draft EIR/EIS describes and evaluates the potential environmental, social and economic effects of the North Bay Water Recycling Program (or North San Pablo Bay Restoration and Reuse Project). The NBWRP Phase 2 would provide increased recycled water supply to urban, agricultural and environmental uses in the North San Pablo Bay region.

In addition to the NBWRP Phase 2, the Draft EIR/EIS considers a No Project Alternative, a No Action Alternative, and a Storage Alternative, an actionable alternative to the Phase 2 Project, intended to meet the purpose, objectives, and need identified by the NBWRA.

1. **No Project Alternative,** assumes that the proposed NBWRP Phase 2 is not implemented and reviews two scenarios: 1) consideration of existing conditions without the program, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the program. This second scenario is identical to the No Action Alternative, identified below.

2. **No Action Alternative,** provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives. It would be anticipated to construct 10.82 miles of pipeline to provide an increment of 1,187 AFY of potable water offset over a longer implementation timeframe between 2015 and 2035.

3. **Proposed Action** would provide 4,885 acre-feet per year (AFY) of recycled water supply through construction of 19.8 miles of pipeline, additional pump stations, 10.1 acre-feet (AF) of storage, and 4.87 million gallons per day (mgd) of wastewater tertiary treatment capacity.

4. **Storage Alternative** would build upon the projects comprising the Proposed Action with additional storage of 1,099 AF, 0.85 mgd of treatment capacity, and 11.2 miles of distribution facilities (pipelines) to provide additional operational flexibility within individual NBWRA Member Agency service areas. Implementation of the Storage Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6,819 AFY of recycled water supply.

This Draft EIR/EIS analyzes the direct, indirect, and cumulative environmental effects of the project on the following resources: hydrology and drainage, water quality, terrestrial and aquatic resources, geological, paleontological, and mineral resources, biological resources, land use, agriculture, transportation and circulation, air quality, noise, utilities and public service systems, hazardous materials and public health, visual/aesthetic resources, recreation, cultural and tribal cultural resources, energy conservation, socioeconomic effects, environmental justice, Indian Trust Assets, growth-inducing effects, and climate change.

Please submit any comments before **5 p.m.** on **May 18, 2018**to ***Anne Crealock, Sonoma County Water Agency***, 404 Aviation Boulevard, Santa Rosa, CA 95403, Phone: (707) 547-1948, Email: Phase2EIR@nbwra.org

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1 The NBWRA was established under a Memorandum of Understanding (MOU) in August 2005, and amended in 2013. Its Member Agencies include eleven wastewater utilities and potable water utilities: Las Gallinas Valley Sanitary District (LGVSD), Novato Sanitary District (Novato SD), Sonoma Valley County Sanitation District (SVCSD), Napa Sanitation District (Napa SD), the City of Petaluma, the City of American Canyon, and Sonoma County Water Agency (SCWA). Additional agencies supporting the NBWRA through contribution of funds and staff time (Cooperating Agencies) include North Marin Water District (NMWD), Marin, and Napa Counties.

2 Pub. Res. Code §21000 et seq.; 14 Cal. Code Regs. §15000 et seq. (the "CEQA Guidelines").

3 42 U.S.C. §4321 et seq.); 40 C.F.R. Part 1500, et seq.

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EXECUTIVE SUMMARY

ES.1 Introduction

The North Bay Water Reuse Authority's (NBWRA) Member Agencies and the U.S. Department of Interior, Bureau of Reclamation (Reclamation), have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the North Bay Water Reuse Program – Phase 2. This program has been developed in conformance with the requirements of the Reclamation's Public Law 102-575, Title XVI, including preparation of a Feasibility Study, and passage of Senate Bill 1475. For the purposes of this EIR/EIS, this project or action will be referred to as the **North Bay Water Reuse Program – Phase 2 (NBWRP Phase 2**).

This EIR/EIS has been developed to provide the public and responsible and trustee agencies reviewing NBWRP Phase 2 an analysis of the potential effects, both beneficial and adverse, on the local and regional environment associated with construction and operation of the elements of NBWRP Phase 2. The basic purpose of NBWRP Phase 2 is to provide recycled water for agricultural, urban, and environmental uses and to expand the recycled water region-wide. Implementation of NBWRP Phase 2 would include upgrades of treatment processes and construction of pipelines, pump stations, and storage to distribute recycled water for use in compliance with Article 4 in Title 22 of the California Code of Regulations, which sets water quality standards and treatment reliability criteria for recycled water.

This EIR/EIS considers a No Project, No Action and two Action Alternatives. The Action Alternatives consist of treatment, distribution, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2020. Each Action Alternative considers varying levels of recycled water use and storage. The Alternatives considered are as follows:

1. **No Project Alternative,** assumes that the proposed NBWRP Phase 2 is not implemented and reviews two scenarios: 1) consideration of existing conditions without the program, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the program. This second scenario is identical to the No Action Alternative, identified below.

2. **No Action Alternative,** provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives. The No Action Alternative would be anticipated to construct 10.82 miles of pipeline to provide an increment of 1,187 AFY of potable water offset over a longer implementation timeframe between 2015 and 2035.
3. **Proposed Action** would provide 4,885 acre-feet per year (AFY) of recycled water supply through construction of 19.8 miles of pipeline, additional pump stations, 10.1 acre-feet (AF) of storage, and 4.87 million gallons per day (mgd) of wastewater tertiary treatment capacity; and,
4. **Storage Alternative** would build upon the projects comprising the Proposed Action with additional storage of 1,099 AF, 0.85 mgd of treatment capacity, and 11.2 miles of distribution facilities (pipelines) to provide additional operational flexibility within individual NBWRA Member Agency service areas. Implementation of the Storage Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6,819 AFY of recycled water supply.

The NBWRA's Member Agencies have collectively prioritized the projects within their individual service areas to participate in the NBWRP Phase 2. These are projects that each Member Agency has defined to a level of detail that allows for project-level environmental review and will be collectively referred to as the NBWRP Phase 2. This EIR/EIS will be relied upon by the individual Member Agencies for approval of each project under the Program.

ES.1.1 Purpose and Need of the Proposed Action

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau of Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575). Also known as Title XVI, the act directs the Secretary of the Interior to undertake a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater.

The NBWRA is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water and integrated water management. The purpose of NBWRP Phase 2, or the Proposed Action, is to expand the provision of recycled water for agricultural, urban, and environmental uses, thereby reducing reliance on local and imported surface and groundwater, while also reducing the amount of treated effluent releases to San Pablo Bay and its tributaries, as well as to promote other integrated use strategies to improve water supply reliability.

ES.1.2 Project Objectives

In addition to the purpose and need for the proposed Federal Action, the following objectives have been developed by the NBWRA for the NBWRP Phase 2. It is proposed to promote the expanded beneficial use of recycled water in the North Bay region to achieve the following objectives:

1. Improve local, regional, and State water supply reliability;
2. Offset demands on potable water supplies;
3. Support the sustainable management of groundwater basins;
4. Enhance local and regional ecosystems;
5. Maintain and protect public health and safety;
6. Promote sustainable practices; and,
7. Implement recycled water facilities in an economically viable manner.

All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action will be made available for use to new and existing water customers on reasonable terms and conditions. As appropriate, fee structures for recycled water have been or will be developed by Member Agencies within the context of each agency's rules, regulations and financial planning.

ES.1.3 Proposed Federal Action

As implementation of the Proposed Action would likely require external funding assistance, the investigation and development of the action is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects. The proposed Federal Action is the provision of federal funds by the Bureau of Reclamation under the Title XVI Program to NBWRA Member Agencies for the implementation of water recycling projects examined in this EIR/EIS. The Bureau of Reclamation is the NEPA Lead Agency for this Proposed Action.

Reclamation intends to use this EIR/EIS to consider provision of Federal funding under Title XVI for implementation of NBWRP Phase 2. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives, including the Proposed Action and No Action.

ES.1.4 Proposed CEQA Project

The NBWRA Member Agencies and cooperating agencies may use this EIR/EIS to approve the NBWRP Phase 2, as a whole or its components, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. The Sonoma County Water Agency (SCWA) will act as CEQA Lead Agency. Individual NBWRA Member Agencies and cooperating agencies are Responsible Agencies as provided for under CEQA §15096 and may use this EIR/EIS for the approving the proposed components (i.e., Phase 1) in their respective service areas.

ES.1.5 Project Background

The North Bay Water Reuse Authority (NBWRA), originally established under a Memorandum of Understanding (MOU) in August 2005 and most recently amended November 2017, is comprised of 11 wastewater and potable water utilities as Member. A roster of the Member Agencies and their participation in NBWRP Phase 1 and/or Phase 2 is shown in **Table ES-1**.

Under the MOU, the NBWRA continues to explore opportunities to coordinate "interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." Under Phase 2, the NBWRP would provide opportunities to deliver recycled water and integrated water management systems in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

Under the MOU, the NBWRA continues to explore "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." NBWRP Phase 2 would continue to redirect recycled water in the North Bay Region for beneficial reuse by providing increased recycled water supply to urban, agricultural and environmental uses.

TABLE ES-1: NBWRA MEMBER AGENCIES: PHASE 1 AND PHASE 2 PARTICIPATION

Member Agency	Phase 1 Participant	Phase 2 Participant
City of American Canyon		✓
City of Petaluma		✓
Las Gallinas Valley Sanitary District	✓	
Marin Municipal Water District		✓
Napa County	✓	
Napa Sanitation District	✓	✓
North Marin Water District	✓	
Novato Sanitary District	✓	✓
Sonoma County Water Agency	✓	✓
Sonoma Valley County Sanitation District	✓	✓

ES.1.6 Project Location

The action area, illustrated in **Figure ES-1**, extends approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa counties encompassing approximately 320 square miles of land area. The action area extends as far south as Point San Pedro in Marin County and as far north as Milliken Canyon located 28 miles to the northeast in eastern Napa County. Urban centers in the action area are San Rafael (county seat) and Novato in Marin County, Petaluma and Sonoma in Sonoma County, and Napa (county seat) and American Canyon in Napa County. All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action would be made available for use to new and existing water customers on reasonable terms and conditions.

ES.2 Description of Project Alternatives

ES.2.1 Overview of Alternatives

This EIR/EIS considers a No Project Alternative, No Action Alternative, and two Action Alternatives. The Action Alternatives consist of treatment, distribution, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area. **Table ES-2** summarizes the key distinctions among the NBWRP Phase 2 alternatives. The action alternatives could be constructed and in operation by 2025 if required approvals, authorizations, appropriations, and permits are obtained.

TABLE ES-2: ALTERNATIVES SUMMARY

Project Components	No Project	No Action	Proposed Action	Storage Alternative
Distribution Pipeline	0.0	11.67	19.8	31.0
Pump Stations (Horsepower)	0	0	1 (50 hp)	3 (2,650 hp)
New Recycled Storage (acre-feet)	0.0	0.0	10.0	1,109.2
WWTP Tertiary Treatment Capacity Upgrades (million gallons per day)	0.0	0.0	4.87	5.72
Project Yield/Potable Offset (acre-feet per year)	0.0	1,187	4,885	6,819

SOURCES: Brown and Caldwell, 2017.

The development of alternatives for NBWRP Phase 2 was completed as part of the iterative Feasibility Study process required under Reclamation's Title XVI Program. NBWRP Phase 2 builds upon NBWRP Phase 1 technology and infrastructure investments to further develop recycled water as part of the North San Pablo Bay region's water supply portfolio.

As explained in the *North Bay Water Reuse Program Phase 2 Feasibility Study* prepared for NBWRA (Brown and Caldwell, 2017), a stakeholder-driven process was applied to select the suite of projects which would comprise the NBWRP Phase 2. NBWRP objectives and sub-objectives were used to screen and score the projects initially identified and to demonstrate the qualitative and quantitative value each project would contribute to meeting these objectives. Using that refined list of projects, the process was re-applied to include screening and valuation to formulate NBWRP Phase 2 alternatives.

This EIR/EIS may be relied upon by individual member agencies for approval of these individual Phase 2 Projects (see **Figure ES-2**). The Member Agencies would implement the Phase 2 elements described below.

ES.2.1.1 No Project Alternative

No NBWRP Phase 2 elements would be implemented under this alternative. For a discussion of the No Project under future conditions, see No Action Alternative below.

ES.2.1.2 No Action Alternative

Consideration of the No Action Alternative is required under NEPA. The No Action Alternative represents a "future-without-project" scenario: a continuation of existing conditions for an estimation of the most reasonable future conditions that could occur without implementation of the Proposed Action or Storage Alternative. The No Action Alternative assumes that there is no joint action among the Member Agencies. It represents the "current status" in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, and the potential need to develop additional potable water supplies continues to be a regional challenge. In general, each Member Agency would continue to implement individual water recycling projects, subject to the availability of funding and completion of the environmental review process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 acre-feet-per-year [AFY] yield), Turnout to Wetlands (Novato SD; 0.02 mile of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

ES.2.1.3 Proposed Action

NBWRP Phase 2, or Proposed Action, builds upon the NBWRA's Phase 1 infrastructure investments, which included $104 million in treatment, distribution, and storage projects to develop recycled water as part of the region's water supply portfolio. Building on Phase 1 technology and infrastructure investments, NBWRP Phase 2 would deliver increased yield through expanded treatment, new pipelines, and additional storage projects, while building resiliency into the region's long-term water supply through the use of recycled water. The Proposed Action would provide 4,885 AFY of recycled water supply through construction of 19.8 miles of pipeline, additional pump stations, 10 acre-feet (AF) of storage and 4.87 million gallons per day (mgd) of WWTP tertiary treatment capacity.

ES.2.1.4 Storage Alternative

The Storage Alternative would include the Proposed Action, as well as additional storage, treatment and distribution facilities to provide additional operational flexibility within individual Member Agency service areas. This alternative would include additional storage of 1,099 acre-feet (AF), treatment (0.85 mgd) and distribution facilities (11.0 miles) beyond the NBWRP Phase 2 to provide additional operational flexibility within individual Member Agency service areas. Implementation of this Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6,819 AFY of recycled water supply.

Table ES-3 summarizes the components proposed under the action alternatives.

ES.3 Summary of Potential Environmental Impacts and Mitigation Measures

The impacts are analyzed for construction and operation of NBRWP Phase 2 for the individual Member Agencies in compliance with both CEQA and NEPA. While the project alternatives are designed to provide recycled water to offset potable water supplies and achieve the project objectives discussed above, these alternatives also would result in some short-term and long-term impacts to the environment. **Table ES-5**, included in Appendix ES, summarizes the environmental impacts associated with each of the project alternatives. For impacts determined to be significant, mitigation measures are presented and the impact significance after mitigation is shown. The environmental impacts associated with the project alternatives can be generally categorized as follows: project construction; project operation; climate change; and growth-inducement.

ES.3.1 Construction

Most environmental impacts identified for the project alternatives would be associated with project construction; these impacts would occur as individual projects are implemented by Member Agencies and would cease once project construction is completed. Construction impacts include effects associated with transport of construction materials and equipment and carrying out construction activities, such as excavation, grading, foundation development, paving, and building of structures. Construction activities generate

TABLE ES-3: SUMMARY OF PROJECT COMPONENTS PER ALTERNATIVE

Project Components	No Project	No Action	Proposed Action	Storage Alternative
Distribution Pipelines (in miles)				
Novato SD	--	1.12	1.12	2.92
SVCSD	--	--	2.2	2.2
MMWD	--	--	1.1	1.1
Napa SD	--	--	0.1	9.3
Petaluma	--	8.0	11.4	11.6
American Canyon	--	1.7	3.9	3.9
Total Pipeline	**0.0**	**10.8**	**19.8**	**31.0**
Pump Station (in horsepower)				
Novato SD	--	--	--	5
SVCSD	--	--	--	50
MMWD	--	--	50	50
Napa SD	--	--	--	300
Petaluma	--	--	--	--
American Canyon	--	--	--	--
Total Pump Stations	**0**	**0**	**50**	**405**
New Recycled Storage (acre-feet)				
Novato SD	--	--	--	150
SVCSD	--	--	--	49
MMWD	--	--	0.1	0.1
Napa SD	--	--	10.0	610
Petaluma	--	--	--	300
American Canyon	--	--	--	--
Total New and Existing Storage	**0.0**	**0.0**	**10.1**	**1,109.2**
WWTP Treatment Upgrades (million gallons per day)				
Novato SD	--	--	0.85	1.7
SVCSD	--	--	--	--
MMWD	--	--	0.2	0.2
Napa SD	--	--	1.7	1.7
Petaluma	--	--	2.12	2.12
American Canyon	--	--	--	--
Total Tertiary Treatment Capacity Increase	**0.0**	**0.0**	**4.87**	**5.72**
Project Yield (acre-feet per year)				
Novato SD	--	880	1,166	1,602
SVCSD	--	--	200	298
MMWD	--	--	153	153
Napa SD	--	--	811	1,911
Petaluma	--	223	2,278	2,578
American Canyon	--	84	277	277
Total Potable Offset	**0.0**	**1,187**	**4,885**	**6,819**

NOTE: The No Project Alternative would be equivalent to existing conditions and no project elements would be implemented, therefore not included in the table.

SOURCE: Brown and Caldwell, 2017.

impacts such as noise, dust, impacts to sensitive species or wetland habitats, temporary effects on agricultural activities, construction traffic and access disruption, increased erosion, or increased potential for spill of hazardous materials used in construction (such as fuel or paint) and related water quality issues. In some cases, construction effects were found to be less than significant and in other cases they were determined to be significant. In all cases, feasible mitigation measures have been identified to reduce construction impacts to less than significant levels. There would be no significant and unavoidable construction impacts, with the exception of air quality. The Storage Alternative was found to have significant, unavoidable impacts with regard to construction emissions and compliance with the Bay Area Air Quality Management District's 2017 Clean Air Plan.

ES.3.2 Project Operations

Project operational effects relate primarily to the distribution and use of recycled water. These impacts are generally less than significant or mitigable to a less-than-significant level, and include: reduction of the amount of treated effluent discharged to tributaries of North San Pablo Bay; exposure of facilities to 100-year flood events; beneficial effects to groundwater, water supply, and habitat enhancement; potential impacts to groundwater quality; increased use of electricity to pump recycled water to end users; increased greenhouse gas emissions; localized noise increases; localized use of treatment chemicals; beneficial potable water offset; disproportionate effects to minority communities (i.e., increased fees); beneficial socioeconomic effects, and cumulative effects. Conversely, significant and unavoidable growth inducement impacts have been identified in all NBWRA services areas. All of these potential impacts were reduced to a less than significant level of incorporation of the mitigation measures identified in Table ES-5.

ES.3.3 Climate Change

This Draft EIR/EIS examines the potential for the project alternatives to increase greenhouse gas emissions, which in turn would contribute to global climate change effects. As a global concern, increases in greenhouse gases contribute to cumulative impacts, rather than constituting a direct impact associated with a single project. This Draft EIR/EIS also reviews sea level rise and the potential for increased flooding caused by climate change to assess how the project might affect or be affected by these environmental changes.

Project construction and operation would result in increased greenhouse gas emissions. Construction emissions would be short-term. Greenhouse gas emissions associated with project operation would result primarily from recycled water distribution. The project alternatives would not conflict with any measures adopted by the state or other agencies to implement the California Global Warming Solutions Act of 2006 (AB 32), the state law that requires the Air Resources Board to design and implement measures to reduce greenhouse gas emissions to 1990 levels by 2020 or subsequent California Executive Orders S-3-05 and B-30-15 carrying this forth to 2050.

With respect to the potential effects of climate change, the project increases the flexibility of local and regional water supply systems to adapt to changes in water supply availability. The NBWRA Member Agencies have initiated programs to promote sustainability and implement energy efficiency and water conservation programs including local recycled water projects as means of adaptive strategies to the effects of climate change. As part of the proposed project, the NBWRA would expand the recycled water use in the North San Pablo Bay region. As discussed in Section 3.13, Public Services and Utilities, the proposed project would treat and reuse the wastewater that is otherwise discharged to the San Pablo Bay. The project would, therefore, offset the potable water supply, making an equivalent amount of potable water available for other uses. Given the increased variability in the precipitation and thus, the water supplies, the proposed project would have a beneficial effect on the water supplies in the region. The proposed project would provide several opportunities for management flexibility and implementation of adaptive management strategies to improve water supply reliability.

ES.3.4 Growth-Inducement and Secondary Effects of Growth

None of the project alternatives would be directly growth inducing. However, the provision of recycled water, like potable water supplies, would assist in meeting the water supply needs identified for buildout of approved General Plans within the region. As such, provision of recycled water supply would have the potential to contribute to secondary effects associated with development under the approved General Plans. The potential environmental effects of this future planned growth have been evaluated and fully disclosed previously in the CEQA environmental documents prepared the General Plans for Sonoma County, Marin County, and Napa County. Both the General Plans and the water supply planning documents for these areas include policies encouraging the use of recycled water.

ES.3.5 Significant and Unavoidable Impacts

There are no significant and unavoidable impacts identified for the NBWRP Phase 2 (Proposed Action and Storage Alternative), with the exception of the NBWRP's contribution to potential secondary effects of growth associated with development under the approved General Plans within the region, and cultural resource impacts at one of the Napa SD Covered Storage project sites (Option A). A summary of impacts and corresponding mitigation measures by Member Agency is provided in Appendix ES.

ES.4 Issues of Known of Controversy and Issues to be Resolved

ES.4.1 Issues of Known Controversy

Based on public and agency comments received throughout the project planning process, Reclamation and NBWRA have identified no areas of controversy related to the proposed NBWRP. **Appendix 1**, Scoping Report, summarizes all of the issues raised by agencies and the public during the public CEQA and NEPA scoping processes in July-August 2017 and November-December 2017, respectively. Although no areas of controversy were identified, public agencies provided written comments regarding project permitting, project definition, biological resources, cultural resources, noise and construction issues, transportation, and cumulative impacts.

ES.4.2 Issues to be Resolved

Reclamation and NBWRA will need to identify a preferred alternative. The decision will be based on project benefits, potential environmental effects, and numerous factors including the type of financing available, permitting requirements, and implementation schedule. Other issues to be resolved include:

1. Project design and operations will also be refined by Member Agencies through the environmental permitting process, in particular compliance with the federal and state Endangered Species Acts, which will also affect the overall project benefits. The selection of an alternative also determines the level and type of environmental impacts, as described in this Draft EIR/EIS.
2. Regardless of which alternative is selected for implementation, detailed design of project features and planning of construction will need to be coordinated with mitigation requirements so that sensitive resources in the project areas are avoided where practicable. The methods for achieving required mitigation would be determined during detailed project design through consultation and coordination with the permitting agencies.
3. Completion and conclusions of the Federal Feasibility Report, described below in Section ES.6, including related engineering design, economic (costs and benefits), and financial analyses as a basis for determining the type and extent of federal interest in project implementation.
4. Completion and conclusions of public review of this Draft EIR/EIS and the subsequent Final EIR/EIS as a basis for determining mitigation commitments, the Environmentally Superior Alternative per CEQA.

ES.5 Relationship to Environmental Protection Statutes, Plans, and Other Requirements

This Draft EIR/EIS has been prepared in consideration of NEPA, CEQA, and other pertinent federal, state, and local environmental regulations. NEPA requires that environmental consequences of a Proposed Action and project alternatives be considered before the decision making for implementation of a federal project. CEQA requires that environmental consequences of a Proposed Project and project alternatives be considered before approval, financing, or participation by the lead agency pursuant to CEQA. Chapter 7 of this Draft EIR/EIS presents the applicable environmental laws, regulations, and alternative plans being considered and the intended uses and users of the document. This Draft EIR/EIS is not a decision document and is not serving as public notice for any permit actions.

Table ES-4 summarizes the status of consultation for the requirements that must be met by Reclamation and NBWRA before the NBWRP can be implemented.

ES.6 Public Involvement and Next Steps

In accordance with 40 CFR 1508.22, a Notice of Intent (NOI) was published in the Federal Register by Reclamation on November 6, 2017. In accordance with Sections 15063 and 15082 of *CEQA Guidelines*, the NBWRA circulated a Notice of Preparation (NOP) to local, state, and federal agencies, and to other interested parties on July 21, 2017. During the 30-day NOP public review period, NBWRA held four local public scoping meetings on August 2, 3, 9, and 10 at the locations identified below.

August 2, 2017	August 3, 2017	August 9, 2017	August 10, 2017
6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.
San Rafael Community Center 618 B Street, San Rafael	American Canyon City Hall 4381 Broadway, Suite 201, American Canyon	Petaluma Community Center 320 North McDowell Blvd, Petaluma	Sonoma Community Center 276 East Napa Street, Sonoma

TABLE ES-4: SUMMARY OF ENVIRONMENTAL COMPLIANCE FOR THE PROPOSED PROJECT

Requirements	Status of Compliance/Expected Completion
National Environmental Policy Act	Ongoing until this EIR/EIS Record of Decision is published
California Environmental Quality Act	Ongoing until this EIR/EIS document is certified and mitigation met
Federal Endangered Species Act and California Endangered Species Act	Ongoing until project Biological Opinion issued (see Section 3.6, Biological Resources)
Magnuson-Stevens Fishery Conservation and Management Act	Ongoing until project Biological Opinion or ASIP issued (see Section, 3.6 Biological Resources)
Clean Water Act Section 401	Member Agencies will apply for Water Quality Certification after EIR/EIS is approved and project design underway (see Sections 3.6, Biological Resources, and Section 3.5, Water Quality)
Clean Water Act Section 404	Member Agencies will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.6, Biological Resources)
Clean Air Act	In compliance. Conformity analysis is not required. (see Section 3.9, Air Quality)
National Historic Preservation Act and Native American Consultation	Tribal consultation is ongoing. Once Section 106 consultation process is completed with the State Historic Preservation Officer (SHPO), the project will proceed in accordance with conditions stipulated in the agreement with the SHPO and appropriate agencies (see Section 3.14, Cultural Resources and Tribal Cultural Resources).
Assembly Bill 52 Native Americans - California Environmental Quality Act	Ongoing. Establishes a consultation process with all California Native American Tribes on the Native American Heritage Commission list and requires review of Tribal Cultural Resources.
Executive Order 11988 - Floodplain Management	Ongoing. The project complies by using this EIR/EIS to identify and assess project effects (see Section 3.3, Surface Hydrology)
Executive Order 11990 - Protection of Wetlands	Member Agencies will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.6, Biological Resources)
Executive Order 12898 - Environmental Justice	In compliance based on EIR/EIS Section 3.18, Environmental Justice.
Executive Order 13807 – Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects	Ongoing. Establishes page limits and time limits for the review of infrastructure projects under the National Environmental Policy Act.
Migratory Bird Treaty Act	Member Agencies will comply with provisions of the Migratory Bird Treaty Act (see Section 3.6, Biological Resources)
California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement Program)	Ongoing. The project complies with Section 1600 by using this EIR/EIS to identify and address expected project effects (Section 3.6, Biological Resources)
Caltrans Encroachment Permit	Member Agencies will apply for a Caltrans Encroachment Permit to construct within Caltrans right-of-way prior to construction (see Section 3.8, Transportation and Circulation)
Disabilities Regulations - Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act	Project adheres to the construction guidelines of the Uniform Federal Accessibility Standards and complies with regulations proposed for incorporation into the Americans With Disabilities Act Accessibility Guidelines as a part of design for individual facilities.
Farmland Protection Policy Act	Ongoing. (see Section 3.7, Land Use and Agricultural Resources)
Section 10 of the Rivers and Harbors Act of 1899	Ongoing. This regulation is addressed in coordination with other wetlands regulations (see Clean Water Act, Section 404, above)
NPDES Construction Stormwater Permit	Member Agencies will comply by preparing and using a Storm Water Pollution Prevention Plan at the time of construction (see Section 3.3, Surface Hydrology)
General Order for Dewatering and Other Low Threat Discharge to Surface Waters	Member Agencies will comply by preparing and using a permit at the time of construction (see Section 3.3, Surface Hydrology)

Public notices were placed in local newspapers informing the general public of the availability of the NOP and the time and place of scheduled scoping meetings. The purpose of the scoping meetings was to present the Proposed Action to the public through use of display maps, route alignments and handouts describing project components and potential environmental impacts. Attendees were provided an opportunity to voice comments or concerns regarding potential effects of the Proposed Action.

In accordance with CEQA and NEPA review requirements, this Draft EIR/EIS will be circulated for public and agency review and comment for a 45-day period following the date when the U.S. Environmental Protection Agency publishes the Notice of Availability

of Weekly Receipt of Environmental Impact Statements in the Federal Register, and the filing of the Notice of Completion with the California State Clearinghouse. Four public hearings have been scheduled in San Rafael, Petaluma, Sonoma, and American Canyon to receive public input on the Draft EIR/EIS. These hearings will be held during the public review and comment period so that any comments received at the hearings can be addressed in the Final EIR/EIS. In addition, written comments from the public, reviewing agencies, and stakeholders will be accepted during the public comment period.

A Final EIR/EIS that will include responses to all comments will be prepared and circulated in accordance with NEPA and CEQA requirements. The Final EIR/EIS will be circulated for 30 days prior to taking action on the project and issuance of a Record of Decision (ROD).

ES.6.1 NBWRA Decision Making Process

The NBWRA Member Agencies may use this EIR/EIS to approve NBWRP Phase 2, or components of NBWRP Phase 2, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. SCWA will act as CEQA Lead Agency. Individual NBWRA Member Agencies are Responsible Agencies as provided for under CEQA §15096 and may use this EIR/EIS for the approving the proposed components (i.e., Phase 2) in their respective service areas.

ES.6.2 Federal Decision Making Process

Reclamation intends to use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of NBWRP. As lead Federal agency, Reclamation would use this EIR/EIS to support a Record of Decision, which would document Reclamation's decision to choose one of the alternatives including the proposed action and no action.

Integral to the federal decision process are other legally-required processes and information, such as biological opinions from the Federal Endangered Species Act consultation process and permits required by federal, state and local laws. The federal decision process also includes consideration of input from other federal, state, and local agencies, concerned stakeholders, tribes, and the general public.

The final federal decision is documented in a ROD. The ROD will address the decision and the alternatives considered; the alternative(s) considered to be environmentally preferable; the factors that were considered; whether or not all practicable means to avoid or minimize environmental harm for the alternative selected have been adopted, and if not, why; any monitoring and enforcement program established to ensure identified mitigation measures are accomplished; and any significant comments received on the Final EIR/EIS.

Reclamation. Reclamation is the lead Federal agency, as delegated by the Secretary of the Interior, and therefore is responsible for the preparation and processing of the Federal Feasibility Report and EIS. For efficiency, the EIS has been combined with an EIR, prepared by NBWRA for compliance with the CEQA.

While the NEPA compliance process is a subset of the federal feasibility study process, there are important distinctions to make. The purpose of the NEPA process is to analyze and disclose the impacts of a range of alternatives, and to provide an opportunity for public review and comment prior to the final federal decision. The purpose of a Federal Feasibility Report is to address engineering, economic, environmental and financial aspects of alternatives, determine the potential benefits and costs, and determine if there is a federal interest in the implementation of a project.

Upon completion of the Final Federal Feasibility Report and the Final EIR/EIS, Reclamation's Mid-Pacific Regional Director will make a recommendation that will be submitted to the Commissioner of Reclamation for consideration. Then, the Commissioner will concur or modify the recommendation and forward the Final Federal Feasibility Report, Final EIR/EIS, and Draft ROD to the Secretary of the Interior.

Secretary of the Interior. The Secretary will review the Federal Feasibility Report and sign the ROD if he concurs with the recommendation and then send the Final Federal Feasibility Report, Final EIR/EIS, and signed ROD to Office of Management and Budget (OMB) for review.

OMB. In accordance with Executive Order 12322, OMB will review the Federal Feasibility Report for consistency with the policy and programs of the President, the federal Principles and Guidelines for Evaluating Federal Water Projects (P&Gs), and other applicable laws, regulations and requirements relevant to the federal planning process.

Congress. Congress will review the information provided by the Secretary and OMB, and then decide whether to authorize the recommended project. Congress is responsible for authorizing projects for construction and providing appropriations to construct projects.

ES.6.3 Other Uses and Users of the EIR/EIS

The NBWRA Member Agencies may use this EIR/EIS to approve NBWRP Phase 2, or components of NBWRP Phase 2, make Findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts. As the CEQA Lead Agency, SCWA's Board of Directors will consider certification of the EIR/EIS as complete under CEQA (CEQA Guidelines §15090). Once the EIR/EIS has been certified as complete, the Board, or NBWRA Member Agencies, as Responsible Agencies, will consider the certified EIR/EIS (CEQA Guidelines §15096(a)). Any project approvals (see below) would require the Board or NBWRA Member Agencies to make written findings with respect to each significant environmental effect relevant to their aspect of the project identified in the EIR/EIS in accordance with Section 15091 of CEQA Guidelines.

The analyses contained within this EIR/EIS would be used to support the acquisition of the following regulatory permits or approvals if needed:

1. Clean Water Act Section 404– Individual Permit (USACE);
2. Endangered Species Act – Section 7 Consultation (USFWS);
3. 1603 Streambed Alteration Agreement – (California Department of Fish and Wildlife);
4. Section 401 Water Quality Certification (San Francisco Bay Regional Water Quality Control Board);
5. Roadway Encroachment Permit (California Department of Transportation);
6. Roadway Encroachment Permits as applicable (Counties of Marin, Sonoma, and Napa, Cities of San Rafael, Novato, Petaluma, Sonoma, and American Canyon).

The majority of the proposed activities would lie within public rights-of-way. Acquisition of right-of-ways and temporary construction easements may be necessary for construction of some of the proposed facilities. Temporary construction easements would also be required for contractor staging areas and equipment and materials storage.

ES.6.4 Organization of this EIR

This section discusses the organization of this Draft EIR/EIS. This is a "combined document" which is intended to meet the requirements of both CEQA and NEPA. The required contents of an EIR are found in CEQA Guidelines Section 15120, et seq., and guidance for combined documents is found in Guidelines Section 15222. The required contents of an EIS put forward by Reclamation as the federal Lead Agency is found in Chapter 8 of *Reclamation's NEPA Handbook* (Reclamation, 2012).

The organization of this Draft EIR/EIS also responds to the requirements of Order No. 3355 issued by the Secretary of the U.S. Department of the Interior on August 31, 2017. Order No. 3355 promulgates Executive Order 13807, "Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects", issued by the Office of the President of the United States on August 15, 2017. These orders limit the number of pages of an EIS to 150 pages, with an allowance of up to 300 pages for "complex" projects, such as the NBWRP Phase 2. In order to meet this requirement, many elements typically included in the body of an EIR/EIS have been shifted to appendices, which do not figure into the page limit.

CHAPTER 1
Introduction and Project Background

1.1 Project Background, Purpose and Need

The U.S. Department of Interior, Bureau of Reclamation (Reclamation) and Member Agencies of the North Bay Water Reuse Authority (NBWRA) have prepared this Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for Phase 2 of the North Bay Water Reuse Program (NBWRP Phase 2). NBWRP Phase 2 has been developed in conformance with the requirements of: Reclamation's Public Law 102-575, Title XVI, including preparation of a Feasibility Study; the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016 – Title I Water Resources Development, Section 4009 (Public Law 114-322); and, passage of Senate Bill 1475. Consistent with Section 8.5 of Reclamation's NEPA Handbook (U.S. Department of the Interior, Bureau of Reclamation 2012), this section has been prepared in accordance with Title 40 Code of Federal Regulations (CFR) Section 1502.13 to present why the proposed action is being considered.

In 2009, NBWRP Phase 1 Project was approved and implemented by Reclamation and the NBWRA. The basic purpose of the NBWRP Phase 1 was to provide recycled water for agricultural, urban, and environmental uses, as well as to promote the expanded beneficial use of recycled water system in the North Bay region. The Implementation Plan analyzed in the Phase 1 EIR/EIS considered 46.3 miles of pipeline, 6.4 million gallons-per-day (mgd) increased treatment capacity, new pump stations, and 65 acre-feet (AF) of new storage facilities to provide over 3,700 acre-feet-per-year (AFY) of recycled water within the NBWRA service area through 2020.

The proposed NBWRP Phase 2 seeks to continue increasing the beneficial use of recycled water in the North San Pablo Bay Region by reusing water that would otherwise be discharged into San Pablo Bay and its tributaries, for agricultural, urban, and environmental uses. The NBWRP Phase 2 builds upon the NBWRA's Phase 1 infrastructure investments, which included $104 million in treatment, distribution, and storage projects to develop recycled water as part of the region's water supply portfolio. Building on NBWRP Phase 1's technology and infrastructure investments, the NBWRP Phase 2 would deliver increased yield through expanded treatment, new pipelines, and additional storage projects, while building resiliency into the region's long-term water supply through the use of recycled water. The basic purpose of the NBWRP Phase 2 is to continue to provide recycled water for agricultural, urban, and environmental uses and to expand the recycled water system region-wide. Implementation of the NBWRP Phase 2 would include upgrades of treatment processes and construction of storage, pipelines and pump station facilities to distribute recycled water for use in compliance with Article 4 in Title 22 of the California Code of Regulations, which sets water quality standards and treatment reliability criteria for recycled water. See Section 1.3 below and Chapter 2 for more detail on the components of NBWRP Phase2.

As implementation of the NBWRP Phase 2 would likely require external funding assistance, the investigation and development of the NBWRP Phase 2 is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in approved water reuse projects.

The North Bay Water Reuse Authority (NBWRA), originally established under a Memorandum of Understanding (MOU) in August 2005 and most recently amended November 2017, is comprised of 11 wastewater and potable water utilities as Member Agencies – the Las Gallinas Valley Sanitary District (LGVSD), the Novato Sanitary District (Novato SD), the Sonoma Valley County Sanitation District (SVCSD), the Napa Sanitation District (Napa SD), the North Marin Water District (NMWD), Napa County, Marin County (associate membership), the Marin Municipal Water District (MMWD), the City of American Canyon, the City of Petaluma, and the Sonoma County Water Agency (Water Agency). NBWRA Cooperating Agencies[1] include the Central Marin Sanitation Agency (CMSA). The Water Agency is also acting as the administrative agency. A listing of the Member Agencies and their participation in Phase 1 and/or Phase 2 is shown in **Table 1-1**.

Under the MOU, the NBWRA continues to explore opportunities to coordinate "interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." Under Phase 2, the NBWRP would provide opportunities to deliver recycled water and integrated water management systems in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

[1] NBWRA Cooperating Agencies are not contributing funds or staff time to the NBWRA, but may participate in projects.

TABLE 1-1: NBWRA MEMBER AGENCIES: PHASE 1 AND PHASE 2 PARTICIPATION

Member Agency	Phase 1 Participant	Phase 2 Participant
City of American Canyon		✓
City of Petaluma		✓
Las Gallinas Valley Sanitary District	✓	
Marin Municipal Water District		✓
Napa County	✓	
Napa Sanitation District	✓	✓
North Marin Water District	✓	
Novato Sanitary District	✓	✓
Sonoma County Water Agency	✓	✓
Sonoma Valley County Sanitation District	✓	✓

Under the MOU, the NBWRA is exploring "the feasibility of coordinating interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources." The NBWRP would alter the disposition of recycled water in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

1.1.1 Purpose and Need of the Proposed Action

Consistent with the mission of Reclamation "to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public" the NBWRP endeavors to implement sound management of water resources through beneficial reuse strategies. Reclamation's water reclamation and reuse program is authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575, as amended). Also known as Title XVI, the act directs the Secretary of the Interior to undertake a program to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters, and for design and construction of demonstration and permanent facilities to reclaim and reuse wastewater.

The NBWRA is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water and integrated water management. The purpose of NBWRP Phase 2 is to expand the provision of recycled water for agricultural, urban, and environmental uses, thereby reducing reliance on local and imported surface and groundwater, while also reducing the amount of treated effluent releases to San Pablo Bay and its tributaries, as well as to promote other integrated use strategies to improve water supply reliability.

NBWRP Phase 2 is needed as a proactive response to address existing demands on limited potable and groundwater supplies in the North Bay region. The purpose of the NBWRP Phase 2 is to promote the expanded beneficial use of recycled water and integrated water management in the region to:

1. Improve local, regional, and State water supply reliability;
2. Offset demands on potable water supplies;
3. Support the sustainable management of groundwater basins;
4. Enhance local and regional ecosystems;
5. Maintain and protect public health and safety;
6. Promote sustainable practices; and,
7. Implement recycled water facilities in an economically viable manner.

1.2 Compliance with CEQA and NEPA

This document is a joint EIR/EIS and satisfies the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The primary purpose of an EIR/EIS is to identify and publicly disclose any significant environmental impacts that may result from implementation of a project and to identify feasible alternatives, mitigation measures, or revisions to the project that would reduce those impacts, to the degree feasible. This EIR/EIS would be used by local, state, and federal agencies to identify, evaluate, and disclose significant environmental impacts of the proposed action and alternatives, as well as provide potential mitigation measures for impacts.

1.2.1 CEQA Lead, Responsible, and Trustee Agencies

Under CEQA, the lead agency is the public agency that has principal responsibility for carrying out or approving the project (14 Cal. Code Regs. §15367). As the administrative agency acting on behalf of the NBWRA, the Sonoma County Water Agency (Water Agency) is the Lead Agency under CEQA. As the Lead Agency, the Water Agency has primary responsibility for preparing the environmental documentation and the carrying out or approving of NBWRP Phase 2.

Public agencies other than the Lead Agency that have discretionary approval power over a project are "responsible agencies" (CEQA Guidelines §15381). For NBWRP Phase 2, Responsible Agencies include, but are not limited to, the NBWRA Member Agencies and Cooperating Agencies, each of which would rely on this EIR/EIS for project approvals within their service areas. Other responsible agencies may include, but are not limited to: United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries, State Water Resources Control Board (SWRCB), San Francisco Bay Regional Water Quality Control Board (RWQCB), State Lands Commission (SLC), California State Office of Historic Preservation (SHPO), SWRCB's Division of Drinking Water, Bay Area Air Quality Management District (BAAQMD), and Sonoma County, Marin County, and Napa County Public Works Departments.

State agencies that have jurisdiction by law over natural resources affected by a project that are held in trust for the people of the State of California are "trustee agencies" under CEQA (CEQA Guidelines §15386). For NBWRP Phase 2, the California Department of Fish and Wildlife (CDFW) is a Trustee Agency with respect to its jurisdiction over the fish and wildlife of the state and designated rare or endangered native plants.

1.2.2 NEPA Lead Agency

Under NEPA, the lead agency is that entity that prepares or takes primary responsibility for preparing the NEPA document (40 C.F.R. §1508.16). The U.S. Department of Interior, Bureau of Reclamation is the Lead Agency under NEPA. As the NEPA Lead Agency, Reclamation has primary responsibility for analyzing environmental and other impacts on the human environment that would result from NBWRP Phase 2, which is a "major federal action" because it would be entirely or partly financed, assisted, conducted, regulated, or approved by a federal agency (40 C.F.R. §1508.18). Because implementation of NBWRP Phase 2 would likely require external funding assistance, the investigation and development of this program is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in water reuse projects. There is the potential that Congress would authorize and appropriate partial funding for the design and construction of the program under PL102-575, Title XVI and the WIIN Act, referenced above. Based on this authorization and appropriation, Reclamation could provide up to 25 percent of Project planning, design, and construction costs to a maximum federal cost share contribution of $20 million, unless authorized an alternate maximum federal cost share by Congress.

Because the provision of federal funding for implementation of NBWRP Phase 2 to meet regional recycled water needs is a major federal action, this EIR/EIS has been prepared in compliance with NEPA and implementing regulations promulgated by the Council on Environmental Quality (CEQ) (40 C.F.R. §1500 et seq.). The EIR/EIS also has been prepared consistent with Reclamation's NEPA Handbook (U.S. Department of the Interior, Bureau of Reclamation 2012). Other federal agencies, such as the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS) may rely on the EIS to satisfy NEPA for their individual approvals of project components.

1.3 Alternatives Under Consideration

Pursuant to Section 15126(d) of the CEQA Guidelines, an EIR/EIS must describe and evaluate a reasonable range of alternatives that would feasibly attain most of the basic project objectives, and avoid or substantially lessen any of the significant impacts of the project as proposed. The range of alternatives required to be evaluated in an EIR/EIS must be feasible and is governed by a "rule of reason." The EIR/EIS needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision-making and public participation.

Federal agencies must rigorously explore and objectively evaluate all reasonable alternatives to a proposed action. "Reasonable" alternatives are those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant (46 Fed. Reg. 18026, Question 2a). The purpose of analyzing reasonable alternatives is to allow their comparative merits to be considered by agency decision makers and the public (40 C.F.R. §1502.14). The range of potential reasonable alternatives may include alternative sites, project configurations, project sizes, and technologies. Reasonable alternatives do not include those that are remote or speculative or that do not achieve the project purpose and need. Factors considered in the reasonableness determination in this EIR/EIS include the following:

1. Whether a potential alternative is too remote, speculative, impractical, or ineffective; and
2. Whether it accomplishes the purpose of the proposed action.

Alternatives to NBWRP Phase 2 are analyzed in this EIR/EIS relative to the "No Project Alternative" for purposes of CEQA and relative to the "No Action Alternative" for purposes of NEPA. Each of the action alternatives (summarized below and described in Chapter 2) are intended to meet the requirements of CEQA and NEPA.

1. **No Project Alternative**, assumes that the proposed NBWRP Phase 2 is not implemented and reviews two scenarios: 1) consideration of existing conditions without the program, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the program. This second scenario is identical to the No Action Alternative, identified below.
2. **No Action Alternative**, under NEPA provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives. It would be anticipated to construct 10.82 miles of pipeline to provide an increment of 1,187 acre-feet-per-year (AFY) of potable water offset over a longer implementation timeframe between 2015 and 2035.
3. **Proposed Action.** The proposed action would provide 4,885 AFY of recycled water supply through construction of 19.8 miles of pipeline, additional pump stations, 10.1 acre-feet (AF) of storage and 4.87 million gallons per day (mgd) of WWTP tertiary treatment capacity.
4. **Storage Alternative.** This alternative would include additional storage of 1,099 AF, treatment (0.85 mgd) and distribution facilities (11.2 miles) to provide additional operational flexibility within individual Member Agency service areas. Implementation of this Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6, 819 AFY of recycled water supply.

1.4 Intended Use of the EIR/EIS

The Water Agency, as CEQA Lead Agency, and other NBWRA Member Agencies and Cooperating Agencies[2] may use this EIR/EIS to approve the NBWRA Phase 2 Projects, or components of the projects, make findings regarding identified impacts, and, if necessary, adopt a Statement of Overriding Considerations regarding these impacts. Reclamation, as NEPA Lead Agency, would use this EIR/EIS to consider provision of federal funding under Title XVI for implementation of the NBWRP Phase 2 and to support a Record of Decision documenting Reclamation's choice among the alternatives.

Permits, approvals, and other authorizations that may be required to implement NBWRP Phase 2 may include the following:

1. Clean Water Act Section 404– Individual Permit (USACE);
2. Endangered Species Act – Section 7 Consultation (USFWS);
3. 1603 Streambed Alteration Agreement – (CDFW);
4. Section 401 Water Quality Certification (San Francisco Bay RWQCB);
5. Roadway Encroachment Permit (California Department of Transportation [Caltrans]);
6. Roadway Encroachment Permits as applicable (Counties of Marin, Sonoma, and Napa; Cities of Petaluma, San Rafael, Novato, Sonoma, and Napa).

The majority of the proposed activities would lie within public rights-of-way. Acquisition of right-of-ways and temporary construction easements may be necessary for construction of some of the proposed facilities. Temporary construction easements also would be required for contractor staging areas and equipment and materials storage.

1.5 Organization of this EIR/EIS

This section discusses the organization of this Draft EIR/EIS. This is a "combined document" which is intended to meet the requirements of both CEQA and NEPA. The required contents of an EIR are found in CEQA Guidelines Section 15120, et seq., and guidance for combined documents is found in Guidelines Section 15222. The required contents of an EIS put forward by Reclamation as the federal Lead Agency is found in Chapter 8 of *Reclamation's NEPA Handbook* (Reclamation, 2012).

The organization of this Draft EIR/EIS also responds to the requirements of Order No. 3355 issued by the Secretary of the U.S. Department of the Interior on August 31, 2017. Order No. 3355 promulgates Executive Order 13807, "Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects", issued by the Office of the President of the United States on August 15, 2017. These orders limit the number of pages of an EIS to 150 pages, with an allowance of up to 300 pages for "complex" projects, such as the NBWRP Phase 2. In order to meet this requirement, many elements typically included in the body of an EIR/EIS have been shifted to appendices, which do not figure into the page limit.

[2] NBWRA Member Agencies are identified in Section 2. NBWRA Cooperating Agencies include Central Marin Sanitation Agency.

Therefore, the organization of the Draft EIR/EIS is as follows:

Executive Summary includes a brief description of the NBWRA Phase 2 and summarizes construction and operational impacts that the project would have on environmental resources. A summary table presenting each impact, impact determinations for each alternative, applicable and practicable mitigation measures, and impact determination after mitigation that would typically be found in an Executive Summary is found in **Appendix ES**.

Chapter 1, Introduction and Project Background, provides project background information, the purpose and need for the NBWRP Phase 2, a brief description of the environmental review process, a list of permits and approvals that may be needed for the NBWRA Phase 2, and the organization of the EIR/EIS.

Chapter 2, Project Description, describes the NBWRP Phase 2 (i.e., Proposed Action), including proposed elements, as well as the construction and operational phases. Alternatives to the Proposed Action are also presented in this chapter. Graphics showing each of the Proposed Action elements are found in **Appendix A**.

Chapter 3, Environmental Consequences, describes existing resources in the NBWRP Phase 2 area, identifies evaluation criteria, and identifies and analyzes the environmental effects that were found to be significant during the preparation of this Draft EIR/EIS. As applicable to each resource analysis, the discussion of environmental setting, regulations and policies applicable to the Proposed Action (i.e., Regulatory Framework), graphics, and impact summary tables are found in **Appendices 3.2** to **3.19**, numbered to correspond to each analysis section.

Chapter 4, Cumulative Impacts, describes the potential impacts of the Proposed Action when considered together with other related projects in the action area. A list of cumulative projects with the NBWRP Phase 2 area considered in this analysis is found in **Appendix 4**.

Chapter 5, Growth Inducement and the Secondary Effects of Growth, describes the potential for the Proposed Action to induce growth and discusses any indirect impacts. A summary of secondary effects of growth identified in each of the Member Agency General Plans is provided in **Appendix 5**.

Chapter 6, Alternatives Analysis, presents an overview of the alternatives development process and describes the alternatives to the Proposed Action that were considered. Supporting information is provided in **Appendix 6**.

Chapter 7, Agency Consultation/Coordination, summarizes public and agency involvement activities which satisfy CEQA and NEPA requirements for public scoping and agency consultation and coordination.

Chapter 8, Indian Trust Assets, discloses any Indian Trust Assets in the NBWRA Phase 2 area.

Chapter 9, Other NEPA Issues, discusses the irreversible and irretrievable commitments of resources which may occur should the Proposed Action be implemented and how the Proposed Action would affect the short-term use and the long-term productivity of the environment.

Appendices provide technical information in support of the above chapters. The alpha-numeric designations for these appendices are primarily intended to correspond to the companion section. The appendices are:

Appendix A includes the figures, maps, and graphics referenced throughout the document.

Appendix B includes a list of Acronyms and Abbreviations used in this document.

Appendix C includes a list of all the References cited in this document, organized by section.

Appendix D identifies authors and consultants involved in preparing this Draft EIR/EIS, including persons and organizations consulted.

Appendix ES includes a summary impact table to support the Executive Summary.

Appendix 1 provides the Notice of Preparation (CEQA), Notice of Intent (NEPA), and Scoping Report.

Appendices 3.2 to **3.19** contain figures, Impact Summary Tables, Regulatory Framework discussion, analytical data, etc., used to support each impact analysis.

Appendix 4 includes the table of area projects considered in the analysis of Cumulative Impacts.

Appendix 5 provides background information on Member Agency water demands and reviews this relative to the growth contemplated in each jurisdiction's General Plan and General Plan EIR.

Appendix 6 provides a comparison of impacts between alternatives considered for the NBWRP Phase 2.

Appendix 8 presents the Indian Trust Assets request form supporting the findings for the Proposed Action.

1.6 CEQA/NEPA Process and Public Engagement

1.6.1 Notice of Preparation

In accordance with CEQA Guidelines Sections 15063 and 15082, the NBWRA circulated a Notice of Preparation (NOP; State Clearinghouse #2017072051) to local, state, and federal agencies, and to other interested parties on July 21, 2017. The NOP was filed with the State Clearinghouse and was available online on the North Bay Water Reuse Program website [http://www.nbwra.org/]. The NOP was directly mailed to 238 parties, and a postcard notification of the NOP's availability was sent to 508 parties. The NOP was circulated for a 30-day public review period, which ended on August 21, 2017.

1.6.2 Notice of Intent

In accordance with 40 C.F.R. §1508.22, a Notice of Intent (NOI) was published in the Federal Register by Reclamation on November 6, 2017. During the 30-day public review period, written comments received Reclamation during the NOI public review period, which closed on December 6, 2017, are summarized in Section 1.6.3 below.

1.6.3 Public Scoping

NBWRA held four public scoping meetings on the dates of August 2, 3, 9, and 10, 2017 at the locations identified below.

August 2, 2017	August 3, 2017	August 9, 2017	August 10, 2017
6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.
San Rafael Community Center 618 B Street, San Rafael	American Canyon City Hall 4381 Broadway, Suite 201, American Canyon	Petaluma Community Center 320 North McDowell Blvd, Petaluma	Sonoma Community Center 276 East Napa Street, Sonoma

Public notices were placed in newspapers local to the NBWRP Phase 2 project area including: the Marin Independent Journal, the Napa Valley Register, the Petaluma Argus Courier, the Santa Rosa Press Democrat, the Sonoma Index Tribune, and the American Canyon Times Herald for the purposes of informing the general public of the availability of the NOP and NOI and the time and place of scheduled scoping meetings. The purposes of the scoping meetings were to present the Proposed Action to other agencies and members of the public through use of display maps, route alignments and handouts describing project components and potential environmental impacts and to seek input as to the appropriate scope and content of the EIR/EIS, including primary issues of concern and the range of alternatives to be considered. Attendees were provided an opportunity to voice comments or concerns regarding potential effects of the Proposed Action.

Written comments received during the Scoping Meeting and circulation of the NOP and NOI are included in **Appendix 1**. Written comments were received from the Native American Heritage Commission, the California Department of Fish and Wildlife, the California Department of Transportation, the State Water Resources Control Board Division of Financial Assistance, and one member of the public. The comments included questions regarding location of construction staging areas, noise and dust concerns, requests for clarification regarding the timing and duration of project construction phasing, location and proximity of proposed pipelines to the state transportation network, number of construction and operations staff, footprints of permanent project features, staging areas and access routes, as well as standard agency guidance regarding matters such as applicability of resource-specific state laws, specific consultation requests and suggested avoidance measures for special status species to support informed fisheries and other wildlife considerations. Caltrans suggested a transportation management plan for project areas adjacent to State Route 29 and provided guidance on how to apply for encroachment and other traffic permits.

1.6.4 Draft EIR/EIS

This document constitutes the Draft EIR/EIS. It describes the proposed NBWRP Phase 2 and potential alternatives to NBWRP Phase 2; describes the affected environment (sometimes referred to as the environmental setting) and applicable regulatory framework; identifies thresholds of significance; evaluates potential direct, indirect and cumulative impacts relative to those thresholds; and, where a potential significant adverse impact has been identified, recommends one or more mitigation measures that could, if implemented, avoid or reduce the impact below established thresholds. The analysis also identifies the level of significance following the implementation of recommended mitigation measures. Potential impacts are categorized as follows:

1. Significant and unavoidable;
2. Potentially significant, but can be mitigated to a less-than-significant level;
3. Less than significant (without mitigation);
4. No impact; or
5. Beneficial.

NEPA requires that an EIS be prepare when the proposed federal action as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based context and intensity. NEPA requires that the impacts of each alternative be quantified and analyzed at an equal level of detail. This impact analysis should include at least the following items:

1. The direct effects and their significance;
2. The indirect effects and their significance;
3. Quantification of the impact (when possible);
4. Mitigation for the impact; and
5. The resultant net, or residual, impact.

1.6.5 Public Review

This Draft EIR/EIS is being circulated to Tribes; local, state, and federal agencies; and to interested organizations and individuals who may wish to review and comment on it. Publication of this Draft EIR/EIS marks the beginning of a 45-day review period, during which written comments may be directed to the address below. This opportunity for public comment ends on May 18, 2018. During the 45-day review period, the NBWRA will hold public meetings on the Draft EIR/EIS. Meeting times and locations are noted below.

May 7, 2018	May 9, 2018	May 10, 2018	May 14, 2018
6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.
American Canyon City Hall	San Rafael Comm. Center Club Room	Petaluma Community Center Conference Room 2	Sonoma Community Center Room 110
4381 Broadway, Ste 201, American Canyon	618 B Street San Rafael	320 North McDowell Blvd., Petaluma	276 East Napa Street, Sonoma

Public Comments may be forwarded to the following address, or send via email to:

Sonoma County Water Agency
Anne Crealock
404 Aviation Blvd.
Santa Rosa, CA 95403

You may also submit your comments electronically at the following website:

www.nbwra.org

Or via e-mail to:

Phase2EIR@nbwra.org

1.6.6 Final EIR/EIS

Written and oral comments received regarding the Draft EIR/EIS will be addressed in a Response to Comments document that, together with the Draft EIR/EIS, will constitute the Final EIR/EIS. The Sonoma County Water Agency's Board of Directors then will consider certification of the EIR/EIS as complete under CEQA (CEQA Guidelines §15090) and individual Member Agencies will consider approval of the projects within their jurisdictions. Also following completion of the Final EIR/EIS, Reclamation will consider the preparation of a Record of Decision to document Reclamation's decision on the analysis and the NBWRP Phase 2.

1.6.7 Mitigation and Monitoring and Reporting Program

California law requires CEQA lead agencies to "adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment" (CEQA §21081.6, CEQA Guidelines §15097). The NBWRP Phase 2 Mitigation Monitoring and Reporting Program (MMRP) will be appended to the Final EIR/EIS once public and agency comments have been addressed and mitigation measures finalized.

CHAPTER 2
Project Description

2.1 Proposed Federal Action

As implementation of the NBWRP Phase 2 would likely require external funding assistance, the investigation and development of the NBWRP Phase 2 is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, as amended, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects. The proposed Federal Action is the provision of Federal funds by the Bureau of Reclamation under the Title XVI Program to NBWRA Member and Cooperating Agencies for the implementation of water recycling projects examined in this EIR/EIS. The Bureau of Reclamation is the NEPA Lead Agency for this proposed action. The Sonoma County Water Agency, administrative agency for the NBWRA, is the CEQA Lead Agency.

2.2 NBWRA Action Area

The action area, illustrated in **Figure 2-1**, extends approximately 10 to 30 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa counties. The action area extends as far south as San Quentin in Marin County and as far north as Milliken Canyon located 28 miles to the northeast in eastern Napa County, encompassing about 318 square miles of land. Urban centers in the action area are San Rafael (county seat) and Novato in Marin County, Petaluma and Sonoma in Sonoma County, and Napa (county seat) and American Canyon in Napa County. The topography of the action area consists of gently sloping river valleys, separated by northwest trending mountain ranges with steep slopes and peaks exceeding elevations of 2,500 feet above mean sea level. Flat lying mudflats and marshland line San Pablo Bay. The majority of the action area is within Napa, Sonoma, Petaluma and Novato Valleys and the foothills bounding these valleys.

The action area receives water supplies from sources both within and outside the region. Water sources within the region include the Petaluma and Napa Rivers, Sonoma Creek, Stafford Lake on Novato Creek, and MMWD's watershed lands on the north flank of Mount Tamalpais. Surface water sources outside the region include the Russian River (including Lake Mendocino, Lake Sonoma, and imports from the Eel River via Pacific Gas & Electric Company's Potter Valley Project), Warm Springs Creek, Lake Hennessey, Milliken Reservoir, MMWD's five Lagunitas Creek watershed reservoirs, Soulajule Reservoir on Walker Creek, and the Sacramento-San Joaquin Delta via the State Water Project. The region relies on groundwater and recycled water as additional sources.

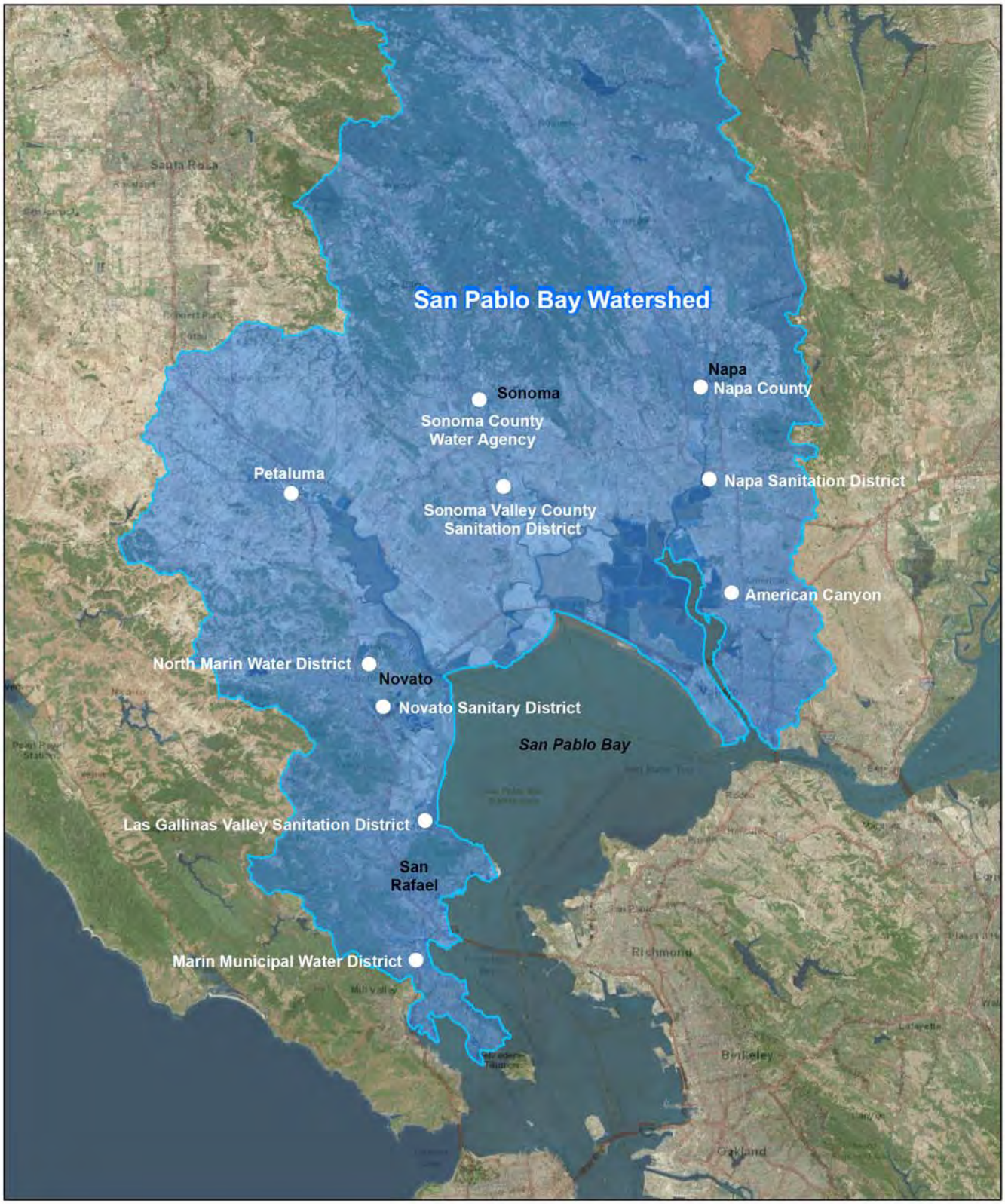
All of the Member Agencies already have existing recycled water programs. The NBWRA anticipates that provision of recycled water from the Proposed Action would be made available for use to new and existing water customers on reasonable terms and conditions. As appropriate, fee structures for recycled water have been or would be developed by Member Agencies within the context of each agency's rules, regulations and financial planning.

2.3 Action Alternatives to be Considered

2.3.1 Action Alternatives Summary

This EIR/EIS considers the No Project Alternative, a No Action Alternative and a Storage Alternative, in addition to the Proposed Action. The Action Alternatives consist of treatment, transmission, and storage facilities necessary to meet a range of recycled water demand scenarios within the NBWRA service area through 2025. Each Action Alternative considers varying levels of recycled water use and corresponding levels of regional facility integration. The No Project Alternative, No Action Alternative, and Action Alternatives are as follows:

1. **No Project Alternative**, assumes that the proposed NBWRP Phase 2 is not implemented and reviews two scenarios: 1) consideration of existing conditions without the program, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the program. This second scenario is identical to the No Action Alternative, identified below.
2. **No Action Alternative**, under NEPA provides a "future without the project" scenario as a baseline to compare the impacts of the proposed Action Alternatives. It would be anticipated to construct 10.82 miles of pipeline to provide an increment of 1,187 acre-feet-per-year (AFY) of potable water offset over a longer implementation timeframe between 2015 and 2035.



SOURCE: North Bay Water Reuse Authority; Calwater 2.2.1

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-1

NBWRP Member Agencies

3. **Proposed Action.** The proposed action would provide 4,885 acre-feet per year (AFY) of recycled water supply through construction of 19.8 miles of pipeline, one additional pump station, 10 acre-feet (AF) of storage and 4.87 million gallons per day (mgd) of WWTP tertiary treatment capacity.
4. **Storage Alternative.** This alternative would include additional storage of 1,099 acre-feet (AF), treatment (0.85 mgd) and distribution facilities (11.2 miles) beyond the NBWRP Phase 2 to provide additional operational flexibility within individual Member Agency service areas. Implementation of this Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6,819 AFY of recycled water supply.

2.3.2 No Project Alternative

The No Project Alternative assumes that the proposed NBWRP Phase 2 is not implemented and reviews two scenarios: 1) consideration of existing conditions without the Program, a "no build scenario"; and 2) consideration of "reasonably foreseeable" future conditions without the Program. This second scenario is identical to the No Action Alternative, identified below, and will be examined under that heading.

2.3.3 No Action Alternative

Analysis of a "No Action Alternative" provides decision makers with a benchmark against which to compare the magnitude of environmental effects of the action alternatives. The No Action Alternative represents a "future-without-project" scenario: a continuation of existing conditions for an estimation of the most reasonable future conditions that could occur without implementation of any action alternatives.

The No Action Alternative assumes that there would be no joint NBWRP Phase 2 among the Member Agencies. It represents the "future without project" scenario in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, with the potential need to develop additional potable water supplies continuing to be a regional challenge. In general, each Member Agency would continue to implement individual recycling projects, subject to the availability of funding and completion of the CEQA process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region. Additionally, the lack of federal funding would delay or preclude the implementation of individual planned projects, due to the need to increase user rates in order to provide funds for implementation.

Specific projects that would have the greatest potential to be implemented under the No Action Alternative are identified below in **Table 2-1** and in **Figure 2-2**. In summary, the No Action Alternative would be anticipated to construct 10.82 miles of pipeline to provide an increment of 1,187 AFY of potable water offset over a longer implementation timeframe between 2015 and 2035.

As a joint EIR/EIS, this impact analysis will consider two baselines; the CEQA Baseline standard, which requires a project to review its impacts relative to "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison between an Alternative and the conditions anticipated under the No Action Alternative (i.e., construction of the facilities identified above). Typically, the CEQA impact analysis will include the NEPA increment of impact, as the CEQA analysis requires a broader comparison between existing conditions and post-project conditions. Where appropriate, the NEPA increment of impact between the No Action Alternative and the Project Alternatives will be identified, and reviewed for significance.

2.3.4 Proposed Action - NBWRP Phase 2

The NBWRP Phase 2 builds upon the NBWRA's Phase 1 infrastructure investments, which included $104 million in treatment, distribution, and storage projects to develop recycled water as part of the region's water supply portfolio. Building on NBWRP Phase 1 technology and infrastructure investments, the NBWRP Phase 2 would deliver increased yield through expanded treatment, new pipelines, and additional storage projects, while building resiliency into the region's long-term water supply through the use of recycled water. **Figure 2-3** shows the geographic relationship of the NBWRP Phase 2 projects with those implemented under Phase 1, as well as other existing facilities.

The NBWRA's Member Agencies have collectively prioritized the projects within their individual service areas to participate in the NBWRP Phase 2. These are projects that each Member Agency has defined to a level of detail that allows for project-level environmental review and will be collectively referred to as the NBWRP Phase 2. This EIR/EIS will be relied upon by the individual Member Agencies for approval of each project under the Program. **Table 2-2** summarizes these projects.

Collectively, the NBWRP Phase 2 would provide 4,885 AF of new recycled water for beneficial use and would include: installation of 19.8 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 4.87 million gallons per day (mgd) of tertiary treatment capacity, and development of approximately 10.1 AF of storage, primarily for agricultural use. As with the Phase 1 projects, Phase 2 projects would offset drinking water that would no longer be used for non-potable uses, thus ensuring the highest quality water is reserved for potable uses.

TABLE 2-1: NO ACTION ALTERNATIVE SUMMARY – FACILITIES BY MEMBER AGENCY

Agency	Projects	Project Yield (AFY)	Distribution Pipelines (miles)	Pump Stations (hp)	New Storage (AF)	WWTP Treatment Upgrades (mgd)
Novato SD	RWF Treatment Capacity Expansion	--	--	--	--	--
	Marin County Lower Novato Creek Project 1 - Distribution	40	1.1	--	--	--
	Turnout to Wetlands	840	0.02	--	--	--
SVCSD	Napa Road Pipeline	--	--	--	--	--
MMWD	San Quentin Prison Recycled Water Distribution System	--	--	--	--	--
Napa SD	Increase Soscol WRF Filter Capacity	--	--	--	--	--
	Soscol WRF Covered Storage	--	--	--	--	--
Petaluma	Increase Ellis Creek WRF Capacity	--	--	--	--	--
	Urban Recycled Water Expansion	223	8.0	--	--	--
	Agricultural Recycled Water Expansion – Phase 1	--	--	--	--	--
	Agricultural Recycled Water Expansion – Phase 2	--	--	--	--	--
American Canyon	Recycled Water Distribution System Expansion – Phase 1	84	1.7	--	--	--
	Recycled Water Distribution System Expansion – Phase 2	--	--	--	--	--
	WRF Phase 2 Treatment Plant Upgrades	--	--	--	--	--
	Total	**1,187**	**10.8**	**--**	**--**	**--**

NOTES: RWF = Recycled Water Facility; WRF = Water Reclamation Facility; Ellis Creek WRF = Ellis Creek Water Reclamation Facility; AFY = Acre Feet Per Year; HP = horsepower; AF = Acre Feet; MGD = Million Gallons Per Day

SOURCE: Brown and Caldwell, 2017, ESA 2017.

TABLE 2-2: IMPLEMENTATION PLAN – NBWRP PHASE 2 PROJECTS

Agency	Projects	Project Yield (AFY)	Distribution Pipelines (miles)	Pump Stations (hp)	New Storage (AF)	WWTP Treatment Upgrades (mgd)
Novato SD	RWF Treatment Capacity Expansion	286	--	--	--	0.85
	Marin County Lower Novato Creek Project 1 - Distribution	40	1.1	--	--	--
	Turnout to Wetlands	840	0.02	--	--	--
SVCSD	Napa Road Pipeline	200	2.2	--	--	--
MMWD[1]	San Quentin Prison Recycled Water Distribution System	153	1.1	50	0.08	0.20
Napa SD	Increase Soscol WRF Filter Capacity	571	--	--	--	1.70
	Soscol WRF Covered Storage	240	0.1	--	10.0	--
Petaluma	Increase Ellis Creek WRF Capacity	712	--	--	--	2.12
	Urban Recycled Water Expansion	223	8.0	--	--	--
	Agricultural Recycled Water Expansion 1	813	1.3	--	--	--
	Agricultural Recycled Water Expansion 2	530	2.1	--	--	--
American Canyon	Recycled Water Distribution System Expansion 1	84	1.7	--	--	--
	Recycled Water Distribution System Expansion 2	25	2.0	--	--	--
	WRF Phase 2 Treatment Plant Upgrades	168	0.2	--	--	--
	Total	**4,885**	**19.8**	**50**	**10.1**	**4.87**

NOTES:

[1] 0.08 AF operational storage at CMSA WWTP

RWF = Recycled Water Facility; WRF = Water Reclamation Facility; Ellis Creek WRF = Ellis Creek Water Reclamation Facility; AFY = Acre Feet Per Year; HP = horsepower; AF = Acre Feet; MGD = Million Gallons Per Day

SOURCE: Brown and Caldwell, 2017, ESA 2017.

Sonoma County Water Agency

City of Petaluma

Urban Recycled Water Expansion

ECWRF

SVCSD WRP

Sonoma Valley County Sanitation District

Napa Sanitation District

Soscol WRF

Phase 1 Recycled Water Distribution System Expansion

American Canyon WRF

City of American Canyon

Novato SD RWF

Deer Island WRP

Project - 1 Marin County Lower Novato Creek Project - Distribution

Turnout to Transitional Wetlands

LGVSD WRP

Novato Sanitary District

Marin Municipal Water District

CMSA WRP

San Pablo Bay

Project Location

Pacific Ocean

0 5 Miles

WRP Water Recycling Plant

Existing Pipeline

Phase 1 Pipeline

Future Projects without Action

SOURCE: North Bay Water Reuse Authority

Figure 2-2
No Action/No Project Alternative

Sonoma County Water Agency

Valley of the Moon ASR (Programmatic)

Sonoma ASR (Programmatic)

City of Petaluma

Urban Recycled Water Expansion

Increase ECWRF Capacity

ECWRF

Agricultural Recycled Water Expansion Phases 1 and 2

Agricultural Recycled Water Expansion Phase 3 (Programmatic)

SVCSD Napa Road Pipeline

SVCSD WRP

Sonoma Valley County Sanitation District

Napa Sanitation District

Napa State Hospital Storage Tank (Programmatic)

Soscol WRF

Soscol WRF Increased Filter Capacity

Additional Soscol WRF Covered Storage

Recycled Water Distribution System Expansion Projects RW5 and RW6 (Programmatic)

American Canyon WRF

American Canyon WRF Phase 2 Treatment Plant Upgrades

Phase 1 Recycled Water Distribution System Expansion

Phase 2 Recycled Water Distribution System Expansion

City of American Canyon

Option 1: Site near Highway 37 (Tertiary) 150 AF (Programmatic)

Novato SD WRF

Deer Island WRP

Novato SD RWTF Capacity Expansion

Project - 1 Marin County Lower Novato Creek Project - Distribution

Marin County Lower Novato Creek Project - Restoration (Programmatic)

Turnout to Transitional Wetlands

LGVSD WRP

Novato Sanitary District

Marin Municipal Water District

MMWD Recycled Water Distribution System Expansion to San Quentin State Prison

CMSA WRP

San Pablo Bay

Project Location

Pacific Ocean

0 5 Miles

WRP Water Recycling Plant

Existing Pipeline

Phase 1 Pipeline

Phase 2 Pipeline

SOURCE: North Bay Water Reuse Authority

Figure 2-3
NBWRP Phase 2 Regional Project Map

Table 2-3 summarizes the existing and projected (2025) wastewater in flow, available recycled water, and recycled water supply resulting discharge that would occur under the NBWRP Phase 2. A description of each of the projects, by Member Agency, is provided below.

TABLE 2-3: RECYCLED WATER SUPPLY, DEMAND, AND RESULTING DISCHARGE (AFY) – PHASE 2

WWTP Service Area	WWTP Inflow (2010)		Projected WWTP Inflow (2025)		Existing and Phase I Beneficial Reuse		2025 Supply Available for Phase 2		Proposed Phase 2 Recycled Water		Resulting 2025 Discharge to San Pablo Bay[1]	
	MG	AFY	MG	AFY	MG	AFY	MG	AFY	MG	AFY	MG	AFY
Novato SD	2,033	6,245	2,871	8,811	568	1,744	2,303	7,067	380	1,166	1,923	5,901
Petaluma	1,995	6,122	2,263	6,949	866	2,658	1,397	4,291	743	2,278	656	2,013
SVCSD	1,324	4,063	1,665	5,110	1,088	3,339	577	1,772	65	200	512	1,572
Napa SD	3,100	9,513	3,945	12,107	948	2,911	2,997	9,197	260	810	2,733	8,387
CMSA[2]	4,263	13,082	4,852	14,891	409	1,256	4,443	13,635	49	153	4,394	13,482
American Canyon	508	1560	777	2386	81	248	697	2,138	905	295	601	1,843
Total	**13,223**	**40,585**	**16,373**	**50,254**	**3,960**	**12,156**	**12,414**	**38,100**	**2,402**	**4,902**	**10,819**	**33,198**

NOTES:
1 Resulting discharges based on Phase 2 recycled water use. The number does not equal supply and demand due to evaporative and other losses (e.g. spreading).
2 Partnering with MMWD in the NBWRP Phase 2 project at San Quentin State Prison.

SOURCES: Brown and Caldwell, 2017

2.3.4.1 Novato Sanitary District

Novato Sanitary District Recycled Water Facility Capacity Expansion. This project would include facility upgrades at the existing Novato SD Recycled Water Facility (RWF) to increase tertiary treatment and disinfection capacity by 0.85 mgd, yielding an additional 286 AFY of recycled water based on 0.26 mgd average annual production. The existing 1.7 mgd Novato SD RWF was completed in September 2012 under the Phase 1 Program and currently supplies tertiary recycled water to NMWD. This project would construct additional tertiary filters, associated pipelines and mechanical equipment, and an additional chlorine contact tank within the developed area of the District-owned facility. This project would utilize existing facilities to increase recycled water supply. The project site is located within the disturbed area at the existing RWF and would require minimal construction in undisturbed areas (**Figure 2-4, Appendix A**). This diversion of wastewater effluent for recycled water production would reduce the amount of wastewater discharge into San Pablo Bay.

Marin County Lower Novato Creek Project 1 – Distribution. The Novato Watershed Program aims to provide a system-wide analysis of flood protection options and identify specific opportunities to integrate flood protection goals with creek and wetland restoration elements. The Lower Novato Creek component of the Watershed Program potentially consists of six related projects located downstream of the Sonoma-Marin Area Rail Transit (SMART) bridge to Highway 37 (**Figure 2-5, Appendix A**).

County Project 1 of the Lower Novato Creek Watershed Program (**Figure 2-5, Appendix A**) is the only project that is included in the NBWRP Phase 2 at project level for recycled water implementation. The remaining five projects are categorized as programmatic level projects and are still under consideration by Marin County (these projects are discussed in Section 2.4.) County Project 1 would create habitat opportunities and create levees that could utilize recycled water from Novato SD to establish and maintain habitat. County Project 1 would construct new eco-tone levees, which are horizontal levees constructed at a lower slope (typically greater than 30:1) to provide for more resilient levee protection that is adaptable to sea level rise. This levee design would protect adjacent properties, including the newly upgraded treatment plant, would be adaptive to sea level rise, and would provide upland and transitional habitats adjacent to wetland areas. The eco-tone levees would be able to accommodate recycled water. The NBWRP Phase 2 project eligible to be funded by Title XVI and to be analyzed in this EIR/EIS includes the conveyance facilities necessary to deliver recycled water to the levees. This would include 5,443 linear feet (LF) of 6-inch-diameter distribution pipelines and 337 LF of 4-inch-diamemter distribution pipelines. Project yield would be 40 AFY.

Turnout to Transitional Wetlands (Hamilton-Bel Marin Keys Wetland Restoration Project). Novato SD worked with Coastal Conservancy to gain approval from the San Francisco Bay Regional Water Quality Control Board (RWQCB) to include provisions in the new National Pollutant Discharge Elimination System (NPDES) permit renewal that would allow a turnout from the existing Novato SD outfall for the Coastal Conservancy to use secondary treated wastewater in the next phase of this restoration project. This project would include connecting to the existing outfall pipeline discharging into San Pablo Bay to divert water and discharge into future transitional brackish wetlands created by the Coastal Conservancy, under the Hamilton-Bel Marin Keys (BMK) Wetland Restoration Project. Both the CEQA and NEPA reviews for the larger BMK Wetland Restoration Project were completed in the

Bel Marin Keys Unit V Expansion of the Hamilton Wetland Restoration Project Supplemental EIR/EIS (Jones and Stokes, 2003) and subsequent documentation (ESA, 2017). Minimal new infrastructure (i.e., a hydraulic structure with 100 feet of pipeline) would be required because the existing outfall pipeline would be utilized to convey recycled water for use to restore fresh and brackish marsh habitat along the newly-constructed shoreline (**Figure 2-6, Appendix A**). This project would provide for significant beneficial reuse of water that would otherwise be discharged to the San Pablo Bay. Project yield would be 840 AFY.

This project would utilize existing infrastructure to provide recycled water to an environmental enhancement project. The proposed turnout would provide operational flexibility for Novato SD and contribute to a major increase in new tidal marsh, mudflats, and shallow sub-tidal habitat totaling over 1,500 acres associated with the larger Coastal Conservancy project, which would provide new marsh habitat for a variety of bird and fish species, thereby improving several beneficial uses of San Pablo Bay.

2.3.4.2 Sonoma Valley County Sanitation District

SVCSD Napa Road Pipeline Project. The Napa Road Pipeline would expand the recycled water service area in the unincorporated areas of Sonoma County east of the City of Sonoma along Napa Road (**Figure 2-7, Appendix A**). Pipeline construction would have a project yield of 200 AFY, and include 11,500 LF of 12-inch diameter pipeline located within the roadway or roadway shoulder. The pipeline would connect to existing pipelines and extend eastward from 5th Street East to serve additional customers.

2.3.4.3 Marin Municipal Water District

San Quentin Prison Recycled Water Distribution System. This project includes construction of tertiary treatment facilities at Central Marin Sanitation Agency (CMSA) to treat 0.2 mgd of secondary effluent using microfiltration and chlorine disinfection, with subsequent delivery to San Quentin State Prison. Improvements at CMSA would include microfiltration, 50 HP pump station, chlorine tank retrofit, and 0.08-million-gallon (MG) storage tank. Approximately 5,800 LF of 6-inch pipeline would be installed on CMSA property, Andersen Drive and Sir Francis Drake Boulevard from the treatment facility to the prison grounds (**Figure 2-8, Appendix A**). Tertiary-treated recycled water would be used within the prison grounds for dual plumbing (121.7 AFY), boiler make-up water (14.3 AFY), landscape irrigation (16.4 AFY), use in a car wash (0.1 AFY), and at a truck fill station at CMSA (0.5 AFY) – a total of 153 AFY. The project also includes site retrofits for dual plumbing, and connection of the partially dual-plumbed North, South, East and West blocks at San Quentin.

2.3.4.4 Napa Sanitation District

Soscol Water Recycling Facility Increased Filter Capacity. The Soscol WRF Increased Filter Capacity project would include upgrades at the existing facility to increase tertiary treatment capacity by 1.7 mgd. Filter basins for two filters (comprised of 1,000 square feet of filter area) were constructed as part of the NBWRP Phase 1 Project, but only one filter (500 square feet of filter area) was installed at that time. This NBWRP Phase 2 project consists of installing the remaining filter and associated mechanical components in the existing empty filter basin and would occur within the bounds of the WRF, providing 571 AFY of recycled water based on 0.51 mgd of average annual production (**Figure 2-9, Appendix A**).

Soscol Water Recycling Facility Covered Storage. The project consists of constructing an operational storage pond at the Soscol WRF to store tertiary filtered and disinfected recycled water that would be used to meet daily peak customer demands. Similar to the existing recycled water operational storage ponds at the WRF, the new pond would have a lined high-density polyethylene (HDPE) bottom, HDPE-lined side slopes, and a cover. New pipeline would connect this pond to existing facilities. This project would be located within undeveloped areas currently owned by Napa SD, and would include a 12 AF storage pond within a 1.5-acre footprint, membrane liner, and cover, and approximately 600 LF of connecting pipeline. Two pond layout options are shown in **Figure 2-9, Appendix A.** The project would yield 240 AFY by providing operational flexibility to store and deliver recycled water particularly in high demand summer irrigation periods.

2.3.4.5 Petaluma

Increase Ellis Creek Water Reclamation Facility Capacity. This project would include facility upgrades at the existing Ellis Creek Water Recycling Facility (Ellis Creek WRF) to increase its tertiary filtration and disinfection capacity. The existing Ellis Creek WRF is able to treat 6.8 mgd to secondary treatment standards, but only 4.68 mgd to CCR Title 22 tertiary disinfection standards. The existing post-secondary process includes continuous backwash filters and an ultraviolet (UV) disinfection system. The existing UV system was constructed with a third channel not currently in use to allow for future expansion. This project would install five new filter cells that mirror the existing treatment system and would also install banks of UV lamps in the existing, unused channel (**Figure 2-10, Appendix A**). Proposed facilities would provide 2.12 mgd of new tertiary filtration capacity and a project yield of 712 mgd of recycled water based on an annual average production of 0.64 mgd. These improvements would allow the City of Petaluma to produce additional tertiary treated recycled water to meet increasing recycled water demands.

Urban Recycled Water Expansion. The Urban Recycled Water Expansion project would construct approximately 8.0 miles of recycled water pipelines throughout the eastern portion of the city extending from the end of the existing 20-inch-diameter pipeline that originates from the Ellis Creek WRF to serve customers currently being served by its potable water system (**Figure 2-11, Appendix A**). The project would also extend a pipeline from the existing 8-inch-diameter pipeline near Ellis Creek WRF to serve the Oakmead Business Park. Project implementation would include: 17,500 LF of 16-inch-diameter pipelines; 12,900 LF of 12-inch-diameter pipelines; 10,200 LF of 8-inch-diameter pipelines; 1,600 LF of 2- and 4-inch-diameter pipelines; and 60 LF of special pipeline crossings. Project yield would be 223 AFY.

This project would expand upon existing facilities to increase the distribution of recycled water. The proposed pipeline alignments would be along existing roadways within the city's right-of-way. The number of creek crossings would be minimized and green ways would be avoided to minimize construction in undisturbed areas.

Agricultural Recycled Water Expansion 1 and 2. The City of Petaluma's Agricultural Recycled Water Expansion program would extend recycled water pipelines from the Ellis Creek WRF eastward to serve agricultural customers along Lakeville Highway (**Figure 2-12, Appendix A**). The expansion is divided into three phases: the first two are projects under the Proposed Action, and the third is a program element further described in Section 2.8. Petaluma's first project would construct 1.3 miles of pipeline from the Ellis Creek WRF to Stage Gulch Road, providing 813 AFY of recycled water. Petaluma's second project would extend the pipeline 2.1 miles from Stage Gulch Road to Cannon Road, providing 530 AFY of recycled water. These two projects would include 13,900 LF of 20-inch pipeline, 3,600 LF of 12-inch pipeline and 100 LF of specialized pipeline crossings. The proposed pipeline alignments would be along roads in the public right-of-way, within already disturbed areas. The number of creek crossings would be minimized and green ways would be avoided to minimize construction in undisturbed areas.

2.3.4.6 American Canyon

American Canyon WRF Treatment Plant Upgrades. This project would include facility upgrades at the existing American Canyon WRF to increase tertiary treatment process to improve water quality for existing and future recycled water users. The existing American Canyon WRF consists of a membrane bioreactor (MBR) that has the capacity to produce 3.75 mgd of tertiary recycled water for non-potable reuse in the City's service area. This project would construct a two-stage reverse osmosis (RO) system, modify existing ponds for concentrate disposal, and install new pipelines to connect the existing MBR system to the RO system and from the RO system to the modified ponds for concentrate disposal, all within the developed area of the WRF (**Figure 2-13, Appendix A**). Project yield would be 168 AFY. The proposed upgrades would benefit existing and new recycled water customers by reducing the concentration of total dissolved solids (TDS) in the effluent and providing the necessary facilities for concentrate disposal through modified evaporation ponds.

Recycled Water Distribution System Expansion 1. American Canyon has identified several pipeline extensions from its existing system to deliver recycled water to existing landscaping and industrial users currently on potable water and convert them to recycled water for non–potable uses. The customer demands associated with these extensions would be met directly from the WRF during the peak month. No seasonal storage would be needed. Collectively, City of American Canyon's Recycled Water Distribution System Expansion 1 would provide a yield of 84 AFY and would include 6,110 LF of 12-inch diameter pipelines and 3,070 LF of 6-inch diameter pipelines. Four recycled water pipeline extensions would be located within existing public roadways in the northern and western portions of the city, as described below and shown in **Figure 2-14 (Appendix A)**. Proposed facilities would include: Tower/South Kelly Road Pipeline - 6,100 LF of 12-inch diameter pipeline; Spikerush Circle Pipeline - 800 LF of 6-inch diameter recycled water pipeline; Benton Way Pipeline - 1,670 LF of 6-inch diameter recycled water pipeline; and Dodd/Klamath Court Pipeline - 600 LF of 6-inch diameter recycled water pipeline.

Recycled Water Distribution System Expansion 2. This project includes additional pipeline extensions from the existing recycled water system to provide a yield of 25 AFY recycled water and to convert existing landscaping and industrial users from potable water to recycled water for non-potable uses. The customer demands associated with these extensions would be met directly from the WRF during the peak month. No seasonal storage would be needed. These pipelines would be constructed after the Treatment Plant Upgrades described below are completed. Collectively, components would include 7,080 LF of 12-inch-diameter pipelines, 2,230 LF of 8-inch pipelines, 1,220 LF of 6-inch pipelines. The three recycled water pipeline extensions to be constructed within existing public roadways, as described below and shown in **Figure 2-14** (**Appendix A**), include: Pelleria Drive Pipeline – 790 LF of 6-inch diameter recycled water pipeline; Lombard/Hess Road Pipeline - 2,230 LF of 8-inch diameter recycled water pipeline; Broadway Pipeline - 7,080 LF of 12-inch diameter recycled water pipeline; and 430 LF of 6-inch diameter recycled water pipeline.

2.4 Program Elements

Table 2-4 (below) and **Figure 2-15 (in Appendix A)** identify six projects that will be examined at a programmatic level of analysis. These projects are not proposed for implementation under the NBWRP Phase 2 and would not be funded under Title XVI at this time. In addition to recycled water projects included in the Proposed Action, these projects include restoration and conjunctive reuse projects to promote integrated water management. They are currently at a conceptual level and would be implemented if needed in the future, as additional design and funding become available. These projects will be examined at a programmatic level of analysis to allow for future funding opportunities.

TABLE 2-4: PROGRAM ELEMENTS

Agency	Project Type	Project Name
Novato SD/Marin County	Seasonal Storage	Option 1: Site Near Highway 37 (Tertiary) 150 AF
	Environmental Enhancement	Marin County Lower Novato Creek Projects 2-6: Restoration
City of Petaluma	Distribution	Agricultural Recycled Water Expansion Phase 3
Napa SD	Operational Storage	Napa State Hospital Storage Tank
Sonoma County	Potable Water ASR	Valley of the Moon ASR
Water Agency	Potable Water ASR	Sonoma ASR
American Canyon	Distribution	RW5 (Green Island Road/Jim Oswald Way/Mezzetta Court Pipelines)
	Distribution	RW6 (Hanna Drive Pipeline)

NOTES: ASR = Aquifer Storage and Recovery

2.4.1 Novato Sanitary District

2.4.1.1 Site Near Highway 37 (Tertiary) 150 AF

This project would include construction of new seasonal tertiary recycled water storage pond at a site near Highway 37 to allow Novato SD to store 150 AF of tertiary recycled water during winter months to serve customers during the summer. The proposed storage pond would encompass approximately 18 acres, include 4,000 LF of embankment with a membrane liner and no cover, and would be filled by tapping off an existing 12-inch-diameter recycled water pipeline that runs by the proposed site. One 700 gpm pump station would be included. The storage pond design concept includes the construction of earthen berms using available on-site material from excavation of the berms, supplemented by imported fill when needed. Levees would be constructed with 3:1 horizontal-to-vertical slopes with a 12-foot access road on the top. The storage pond would be uncovered consistent with existing Novato SD facilities. Hydraulic structures with weirs and/or sluice gates would be constructed to control water levels. Appropriate signage and fencing would be installed to prevent public access to the storage pond. The project would include installation of pipelines and a small pump station to convey water to the existing Deer Island Water Reclamation Plant (WRP) where existing pumps would be repurposed to supply recycled water to customers. **Figure 2-16 (Appendix A)** shows the key elements of this project.

2.4.1.2 Marin County Lower Novato Creek Project – Restoration

As mentioned above in Section 2.7.1, the Lower Novato Creek Project consists of six related projects located downstream of the SMART/Northwest Pacific Railroad bridge to Highway 37. County Projects 2 through 6 are included as programmatic level projects. These projects, shown in **Figure 2-17 (Appendix A)**, are described below.

Construction of County Project 2 is also partially funded through the IRWMP grant that is also partially funding County Project 1. County Projects 3 and 4 are considered short-term priorities; funding for these projects is not currently available. Marin County is considering a future special tax measure to leverage grant funds to assist with financing construction of these projects. The facility requirements for the County's Lower Novato Creek Project restoration projects are currently being developed; therefore, preliminary cost estimates have not been prepared at this time.

County Project 2. Enlarge the Novato Creek Corridor between SMART Tracks and Highway 37. County Project 2 would remove (right bank) levees along Novato Creek adjacent to two small ponds (Heron's Beak and Duckbill) to restore 32 acres of tidal marsh and creek floodplain. Levee fill material would be reused to construct new flood protection levees within Lynwood or Deer Island Basin. Removing the levees next to the ponds eliminates a channel constriction and increases the available channel cross section by over 200 percent, improving flood and sediment conveyance. Vegetation would be irrigated with recycled water.

County Project 3. Restore tidal marsh at the northern end of the Lynwood Basin. The northern end (approximately 75 acres) of Lynwood Basin would be restored to full tidal action by constructing an interior berm dividing Lynwood Basin into two parts – tidal marsh and freshwater – providing seasonal stormwater storage and a new flood protection levee to protect the SMART tracks within the tidally restored areas. The material from the existing outboard levee would be removed and reused to construct the new interior berm and flood protection levees. Vegetation would be irrigated with recycled water.

County Project 4. Set Back North Bank Levees to split Deer Island Basin North. This project would set back levees along Novato Creek (North Bank) to expand the Novato Creek floodplain and restore 58 acres of tidal marsh, and would include placement of excavated levee, channel cut material, and coarse sediment along the bayward side of the setback levee or along the basin perimeter to build/expand transitional wetland habitat. The project would maintain a non-tidal portion of North Deer Island Basin to

provide Novato Creek flood storage during high tides, and protect the existing Novato SD force main and maintain access for inspection. Expanding the Novato Creek floodplain into a portion of the North Deer Island Basin adds flood conveyance, sediment storage capacity and restores estuarine tidal wetlands. This would improve flood and sediment conveyance from upstream reaches during both peak and annual storm events, reducing the need for dredging upstream. The added tidal exchange in the wetland increases the downstream self-sustaining channel geometry and reduces the need for lower Novato bayland dredging. Preserving a portion of the basin as non-tidal maintains the opportunity for provide peak flood storage for downtown Novato during high tides. Novato SD currently leases much of the land downstream of Highway 37 from Marin County to use as spray fields. The spray fields are currently an effluent management project to help Novato SD meet its discharge constraints under the NPDES permit. The spray field lands could be returned to Marin County for environmental restoration if Novato SD can either increase recycling with NMWD on the Lower Novato Creek Project, or discharge flows to the Hamilton-Bel Marin Keys Wetlands Restoration Project.

County Project 5. Restore Tidal Marsh to West Basin Oxbow. County Project 5 would involve the construction of a new flood protection levee south of Highway 37 and the SMART/Northwest Pacific Railroad tracks and restore approximately 50 acres of historic tidal marsh immediately downstream of Highway 37. The new setback levee would be constructed along the western meander bend to protect the Novato SD outfall. Restoring tidal exchange would help deepen the channel cross section for improved flood and sediment conveyance, thereby reducing downstream dredging requirements. A new main stem Novato Creek channel alignment would be excavated to reduce creek sinuosity, direct peak floods and recession flows downstream, and restore tidal wetlands. The excavated channel material would be used to construct berms in the basin interior that concentrate low flows and deflect peak flows downstream. Excavated levee material would be placed on the bayward side of the new Coastal Flood Protection levee to increase the area and/or connectivity of high marsh/upland transition zone habitat. The floodplain adjacent to the channel would be graded to support peak flood conveyance and habitat complexity.

County Project 6. Restore East Basin to Tidal Wetlands. County Project 6 would remove remnant perimeter levees reusing the material as needed for construction of transitional upland, high marsh, setback or horizontal levee and/or lateral effluent discharge facilities. Restoring the full tidal exchange would accelerate sedimentation and increase the tidal prism volume; this would help sustain confluence channel geometry. Integration of East Basin and BMK restoration restores an expansive portion of the San Pablo Bayshore line, creating subtidal habitat and increasing the extent and diversity of seasonally estuarine shoreline ecotones. Removal of remnant flood control levees would promote open circulation of water and sediment across 470 acres of wetlands immediately adjacent to San Pablo Bay. Approximately 15,000 LF (2.8 miles) of existing perimeter levee, which constitutes upland fill in wetlands, would be available for removal.

2.4.2 Petaluma

2.4.2.1 Agricultural Recycled Water Expansion 3

This project builds on the previous Petaluma distribution expansions discussed in Section 2.7.1.5 by extending recycled water pipelines eastward from Cannon Road to Old Lakeview Road No. 3. This would deliver 860 AFY of recycled water to agricultural customers. The location of the Expansion 3 alignments is shown in **Figure 2-12** (**Appendix A**). This project would include 9,200 LF of 20-inch diameter pipeline, 2,000 LF of 6-inch diameter pipeline, and 100 LF of specialized pipeline crossing.

2.4.3 Napa Sanitation District

2.4.3.1 Napa State Hospital Storage Tank

The project consists of a new 5 MG operational storage tank to increase availability of recycled water during high demand periods and improve operation of the existing recycled water distribution system, providing a project yield of 429 AFY. The storage tank would be located at approximately 270 feet above sea level to assist with pressure and peak demands of Napa SD's recycled water distribution system. Approximately 4,800 LF of pipeline would be constructed to connect the tanks to the existing recycled water transmission main. The proposed tank site is on volcanic rock, requiring rock bracing at 20-foot intervals for the portion of the pipeline from the base of the hill to the storage tank (approximately 1,800 LF). **Figure 2-18** (**in Appendix A**) shows the pipeline alignment and proposed storage tank location. Considerations for implementation include the need for land acquisition and right of way access for pipeline segments and the storage tank that would be located on land not owned by Napa SD.

2.4.4 Sonoma County Water Agency

2.4.4.1 Valley of the Moon Aquifer Storage and Recovery

The purpose of this aquifer storage and recovery (ASR) project is to provide conjunctive use storage opportunities for potable surface supplies in the Sonoma Valley. The project would use injection well technology to store potable water in the confined aquifer system of the Sonoma Valley Groundwater Subbasin within the service area of the Valley of the Moon Water District (VOMWD) aquifer for later recovery and use. The source water would be potable water produced at the Water Agency's existing

Russian River production facilities. The project would include one injection well to introduce the water into the aquifer for later extraction at the same site during dry months, periods of drought or emergency situations.

The VOMWD ASR site is located near an existing SCWA potable water pipeline in El Verano, which would be used as source water for injection (**Figure 2-19, Appendix A**). A new ASR well with associated appurtenances and two new monitoring wells, would be constructed to allow for injection/extraction operations to store and recover approximately 80 AFY of injected potable water. A new pipeline would be constructed to convey water from the VOMWD ASR to the existing nearby VOMWD potable water distribution system.

2.4.4.2 Sonoma Aquifer Storage and Recovery

Similar to the VOMWD ASR project, the purpose of this project is to provide conjunctive use storage opportunities for potable surface supplies in the Sonoma Valley. This project would use injection well technology to store potable water produced at the Water Agency's existing Russian River production facilities in the City of Sonoma for later recovery and use. Injection wells would introduce potable water into the aquifer with subsequent recovery at the same site during dry months, periods of drought, or emergency situations. A new Sonoma ASR well with associated appurtenances and two new monitoring wells would be constructed to allow for injection/extraction operations to store and recover approximately 60 AFY of injected potable water. Piping would be constructed to convey water from the existing Water Agency potable water distribution system to the Sonoma ASR site (**Figure 2-20, Appendix A**).

2.4.5 American Canyon

Two programmatic-level projects are included for the City of American Canyon, providing a yield of 18 AFY. Collectively, they include 3,450 LF of 8-inch-diameter pipelines and 1,800 LF of 6-inch-diameter pipelines. These projects are shown on **Figure 2-21** (**in Appendix A**). Proposed facilities would include approximately 1,800 LF of 6-inch diameter recycled water pipelines in Green Island Road and Jim Oswald Way, plus approximately 1,500 LF of 8-inch recycled water pipeline in Mezzetta Court. Additionally, 1,950 LF of 8-inch diameter recycled water pipeline in Hanna Drive. This pipe would connect to an existing 12-inch pipe in Commerce Boulevard and an existing 8-inch pipe in the cul-de-sac to the south across North Slough.

2.4.6 Storage Alternative

This alternative would include the Proposed Action, as well as additional storage, treatment and distribution facilities to provide additional operational flexibility within individual Member Agency service areas. The Storage Alternative would include construction of: 1,099 AF of storage facilities in service areas of Novato SD (150 AF of secondary storage), SVCSD (49 AF of tertiary storage), City of Petaluma (300 AF of secondary storage) and Napa SD (600 AF tertiary storage); additional tertiary treatment capacity at Novato SD RWF (0.85 mgd); and additional distribution facilities (11.2 miles of pipeline). Proposed facilities are summarized in **Table 2-5**. Construction of storage facilities would have a construction footprint of approximately 79 acres. Implementation of this Alternative would result in an additional 1,934 AFY of recycled water supply compared to the Proposed Action, providing a total of 6,819 AFY of additional recycled water supply that would be available for beneficial use. Proposed facilities in the Storage Alternative are shown in **Figure 2-22** in **Appendix A**.

TABLE 2-5: STORAGE ALTERNATIVE: ADDITIONAL FACILITIES

Agency	Projects	Project Yield (AFY)	Distribution Pipelines (miles)	Pump Stations (hp)	New Storage (AF)	WWTP Treatment Upgrades (mgd)
	Proposed Action	4,885	19.8	50	10	4.87
Novato SD	RWF Treatment Capacity Expansion	286	--	--	--	0.85
	Seasonal Storage – State Route 37 Option 1	150	1.8	5	150	--
SVCSD	Seasonal Storage – Mulas Site	98	--	50	49	--
Petaluma	Site Southeast of Ellis Creek WRF	300	0.2	--	300	--
Napa SD	Jameson Ranch Site	600	1.1	300	600	--
	MST Northern and Eastern Loop	500	8.1	--	--	--
	Additional Facilities Subtotal	**1,934**	**11.2**	**355**	**1,099**	**0.85**
	Storage Alternative	**6,819**	**31.0**	**405**	**1,109**	**5.72**

NOTES: RWF = Recycled Water Facility Ellis Creek WRF = Ellis Creek Water Reclamation Facility
WRF = Water Reclamation Facility

SOURCE: Brown and Caldwell, 2017

2.4.6.1 Novato Sanitary District

This alternative would include two projects for Novato SD. Tertiary treatment capacity at the Novato SD WRF would be increased by an additional 0.85 mgd beyond the 0.85 upgrade of the Proposed Actions. This alternative would increase the total capacity of the Novato SD WRF to 3.4 mgd with the construction of additional tertiary filters, associated pipelines and mechanical equipment, and additional chlorine contact tank. Proposed facilities would be adjacent to those identified as part of the proposed NBWRP Phase 2. Project yield would be 286 AFY of additional tertiary recycled water.

Additional storage for Novato SD would be provided through construction of a new 150 AF storage pond adjacent to existing storage ponds near State Route 37, as shown in **Figure 2-23** (**Appendix A**). The storage pond construction would include building earthen berms using available on-site material from excavation for the ponds and berms, supplemented by imported fill when needed. Levees would be constructed with 3:1 horizontal-to-vertical slopes with a 12-foot access road on the top. Hydraulic structures with weirs and/or sluice gates would be constructed to control water levels. The pond would not be covered; appropriate signage and fencing would be installed to prevent public access to the storage pond. The pond would be filled by hydraulically linking the proposed pond with another existing effluent storage pond (370 LF of 12-inch diameter pipeline). Stored water would undergo on-site tertiary filtration (sand filter system) before being supplied to customers to remove algae that might form in the ponds. The project would include the installation of pipelines (300 LF of 12”-inch diameter pipeline) and a small (5 hp) pump station to convey the secondary recycled water to the existing Deer Island WRF, where existing pumps would be repurposed. Since this pond would store secondary treated water, approximately 9,000 LF of 12-inch diameter pipelines would also be needed to convey secondary water back to Novato SD WRF for tertiary treatment.

2.4.6.2 Sonoma Valley County Sanitation District

The Storage Alternative would include construction of a new seasonal storage pond at the Mulas site to allow SVCSD to store 49 AF of tertiary treated effluent during winter months to serve nearby agricultural customer demands in summer months. The storage pond would be approximately 5 acres and would include the construction of earth berms using available onsite material from excavation supplemented by imported fill when needed. Embankments would be constructed with 3:1 horizontal to vertical slopes and a 12-foot access road on the top. The pond would not be covered. Appropriate signage and fencing would be installed to prevent public access to the storage pond. A pump station would be required to serve on-site irrigation demands. **Figure 2-24** (**in Appendix A**) shows the key elements of this project.

2.4.6.3 Petaluma

The Storage Alternative would include construction of two new seasonal storage ponds at a site southeast of the existing Ellis Creek WRF ponds to allow the City of Petaluma to store 300 AF of secondary treated effluent during winter months to later serve agricultural customers in summer months. The new ponds would be hydraulically connected with existing storage ponds, Ponds 2 and 3, so no additional pumping would be required. The ponds would be designed with a membrane liner and no cover, would encompass approximately 53 acres, and would include approximate 9,200 LF of levees and 900 LF of 12-inch-diameter pipelines. The storage pond design concept would include the construction of earth berms using available on-site material from excavation of the pond and berms supplemented by imported fill. Similar to the existing ponds, the new ponds would be constructed with levees with a 3:1 horizontal-to-vertical internal slope, a 4:1 horizontal-to vertical external slope, and a 30-foot access road on the top. The ponds would include concrete hydraulic structures with weirs and/or sluice gates to control water levels. Appropriate signage and fencing would be installed to prevent public access to the storage pond. **Figure 2-25** (**in Appendix A**) shows the key elements of this project.

2.4.6.4 Napa Sanitation District

The Storage Alternative would include construction of two new seasonal storage ponds to accommodate 600 AF of recycled water from Soscol WRF during the winter to serve two local golf courses and future customers in summer months. Earthen levees would be constructed to create two adjacent 300 AF ponds hydraulically connected to distribute flow between the ponds. The ponds would encompass approximately 45 acres, with a membrane liner and no cover, and would include construction of approximately 8,100 linear feet of embankment. An existing recycled water distribution pipeline routed through the Jameson Ranch site would be used to convey recycled water to the new storage ponds but an additional 3,200 LF of 18-inch diameter pipeline and 2,800 LF of 12-inch diameter pipeline would be needed to hydraulically connect the ponds to each other and the existing conveyance system. Stored water would undergo on-site tertiary filtration before being supplied to customers to remove algae that might form in the ponds. A new recycled-water pump station would be constructed in two phases (1,800 gpm each) to convey recycled water from the ponds into the existing recycled water distribution system to serve the golf course and other recycled water customers. The storage pond design concept would include the construction of earth berms using available on-site material from excavation for the pond and berms supplemented by imported fill. The pond levee design would be 3:1 horizontal-to-vertical slope and a 12-foot access road on the top. Appropriate signage and fencing would be installed to prevent public access to the storage pond. **Figure 2-26** (i**n Appendix A**) shows the key elements of this project.

The Storage Alternative would also include expanding the Napa SD MST recycled water distribution system to supply 500 AFY recycled water to more customers, thereby reducing reliance on surface and groundwater supplies. This project would include constructing 4.9 miles of pipelines, primarily located within existing roads. **Figure 2-27** (**in Appendix A**) shows the location of these projects, highlighting the Northern Loop and Eastern Extension. The Northern Loop would include: 3,400 LF 16-inch-diameter pipelines; 6,100 LF 12-inch-diameter pipelines; and 16,600 LF 8-inch-diameter pipelines. Pipeline diameters for the Eastern Extension would include: 2,100 LF 16-inch-diameter pipelines; 4,500 LF 12-inch-diameter pipelines; and 7,900 LF 8-inch-diameter pipelines.

2.5 Construction

For the purposes of this EIR/EIS, impact analysis assumes that pipeline installation associated with the implementation of individual projects would be within existing roadway or railroad rights-of-way. As appropriate, those pipeline segments that would intersect potentially jurisdictional streams or wetland features and sensitive species habitat are identified in Section 3.0, Impact Analysis.

2.5.1 Recycled Water Pipelines

Construction of the proposed recycled water pipelines would involve one of the four potential methods: trenching; jack and bore tunneling; directional drilling; or suspending the pipe [from a structure, such as a bridge]. These techniques are shown in **Figure 2-28** (**Appendix A**). In the first three methods, the proposed recycled water pipelines would be installed beneath the ground surface or underneath the existing roads, while in the fourth method the proposed recycled water pipeline might be attached to an existing bridge and would remain aboveground. Interruptions to existing utilities, such as sewer lines or other pipelines would be minimized. In some areas, recycled water pipeline construction would require lane closures along roadways.

2.5.1.1 Trenching

Trenching is a conventional cut-and-cover construction technique. At sites with non-native species or no sensitive biological resources present, the recycled water pipelines would be installed using open-cut trenching. The trenching technique includes clearing of the construction site, saw cutting of the pavement where needed, trench excavation, pipe installation, backfill operations, and re-paving where needed. In undeveloped areas, an approximately 50-foot-wide corridor for construction would be utilized to maximize construction efficiency. Sufficient space would be available to allow the contractor to store the excavated soil to the side of the trench, install the pipe, and backfill the trench with generated soil or clean fill. Pipes would be staged along the alignment in advance of the recycled water pipeline installation. In areas encumbered by existing improvements, high-volume roadways, or environmentally sensitive areas, a narrower construction corridor of approximately 25 feet would be used.

Preliminary vertical alignment includes an average depth of cover between 2 to 10 feet, allowing minimal interference with existing utilities and minimizing the need for fittings. The vertical alignment maintains California Department of Public Health (CDPH) vertical separation requirements, with the recycled water pipeline a minimum of one foot below existing water mains. Depths of cover greater than 15 to 20 feet are assumed to require the use of trenchless construction techniques. The vertical profile minimizes localized high and low elevations to reduce the number of air vacuum and blow-off appurtenances, and subsequently minimizing capital and operation and maintenance (O&M) costs. The estimated trench width for a 14-inch-diameter recycled water pipeline (average size) would be approximately 30 inches. Recycled water pipeline construction would occur at a rate of approximately 300–400 feet per day where the pipelines would cross open land or low-use sections of roadways. In more developed areas, where there are narrow construction corridors, higher traffic volumes, and more utilities, the construction rate is expected to average approximately 100–200 feet per day.

Spoils, excluding asphalt and concrete, would be retained for replacement to avoid soil importation and reduce truck trips. Only contaminated spoils would be excavated along roadways and be hauled off site to appropriate disposal facilities. Backfill material would be imported if necessary. In open space areas, native excavated soils would be retained for backfill.

During construction, vertical wall trenches would be temporarily closed at the end of each work day, either by covering with steel trench plates, backfill material, or installing barricades to restrict access depending on physical conditions and conditions of the encroachment permit (along roadways). If the area is paved prior to construction, a temporary patch or covering would be used until final repaving of the affected area occurs. Final paving would occur approximately two to six weeks after recycled water pipeline construction is complete within a given road segment.

2.5.1.2 Jack and Bore Tunneling

Jack and bore tunneling is a trenchless construction method that would be utilized for installing underground pipelines for short distances without disturbing the ground surface. Jack and bore tunneling could be employed in areas where open cut trenching is not feasible due to limited construction area, geotechnical conditions, railroad crossings, major road crossings, or presence of sensitive biological resources, such as wetlands or riparian habitat. This method employs a horizontal boring machine or an auger that is

advanced in a tunnel bore to remove material ahead of the pipe. Powerful hydraulic jacks are used to push pipe from a launch (or jacking) pit to a receiving pit. As the tunneling auger is driven forward, a jacking pipe is added into the pipe string. Each bore and jack undercrossing would require a jacking pit measuring approximately 30 feet by 10 feet. The temporary pits typically would be excavated to a maximum depth of 20 feet. Recycled water pipeline installation by this method would require approximately one to two weeks per waterway crossing; excavated soils would be retained for backfill.

2.5.1.3 Directional Drilling

Horizontal directional drilling is another trenchless construction method that could be used for installing underground pipelines without disturbing the ground surface. Using a horizontal drill rig, the pipeline is installed in two stages: (1) a small diameter pilot hole is directionally drilled along a designed directional path; (2) the pilot hole is then enlarged to a diameter that would accommodate the pipeline and the pipeline would be pulled back through the enlarged hole. Slurry, typically bentonite (an inert clay), is used as a drilling lubricant and processed by separating solids from the slurry and discharging the clear liquid to waterways or storm drains.

Recycled water pipeline installation by this method would require approximately one to two weeks per waterway crossing. Any unused excavated soils would be hauled off site.

2.5.1.4 Recycled Water Pipeline Suspension

Pipeline suspension is a fourth construction alternative for recycled water pipeline installation and would occur at locations with existing bridges that cross streams. Pipeline construction at these crossings would occur by installing the pipeline in the structural supports underneath or on the sides of the bridges. Design of a bridge crossing (e.g., pipe material and placement) would be determined after project engineers consult with the bridge's proprietor and review the design specifications of the bridge. A lane closure may be required for construction depending on the bridge and surrounding landform configuration; if so, not more than one lane would need to be closed.

Pipeline installation by this method would require approximately one to two weeks per bridge crossing. No excavation would be required.

2.5.1.5 Surface Restoration

The final phase of pipeline construction would be surface restoration. In areas where pipe is installed along roadways, repaving would be the final step. Where temporary patching was performed, permanent repaving would be the final step. Final repaving would be performed either after the entire pipe construction is complete or after segments of pipe construction are complete. Unpaved surfaces would be restored by replanting native grasses. Unpaved areas with high slopes would require some erosion control measures post construction (wattles, hydro-seeding, etc). A permanent right-of-way of approximately 20-30 feet would be needed for the pipelines in areas outside of the roadways.

2.5.2 Storage Facilities

Construction of the new open storage reservoirs would include site preparation and clearing, excavation, earth movement, liner placement, embankment construction, and hydro-seeding. Assuming a surface storage facility of approximately 50 AF, approximately 100,000 cubic yards of material would be excavated to a depth of approximately 6 feet. Approximately 20,000 cubic yards of material would be used to build embankments; the remaining 80,000 cubic yards would be balanced on-site. Approximately 10-15 crew members would be needed for construction, as well as a staging area that can accommodate the required heavy construction equipment (see Section 2.10.4 below). Construction of each storage reservoir is estimated to take approximately eight months. The grading activities would likely need to take place during dry weather to minimize additional construction costs and the storm water impacts outlined that would be in the required Storm Water Pollution Prevention Plan (SWPPP).

2.5.3 Booster Pump Station and Distribution Pump Station

The typical pump station facility footprint is approximately 30 feet by 30 feet. Following rough grading, additional excavation or filling would bring the site to final grade and prepare the soil for underground piping and structural slabs. Much of the site work would take place underground installing manholes, valve pits and the wet well which includes +/-300 cubic yards of excavation. The volume of the wet well may change depending on the hydraulic loads and local design standards specific to that pump station's location. Above ground work includes an approximate 8-foot by 20-foot structure to house equipment and controls complete with structural foundations, curbs, site drainage, fencing, and sidewalks. After the structure has been erected and roofed, electrical equipment (e.g., machinery control consoles, panels, switchboards, lighting, etc.) would be installed. Site work such as installing pull boxes, conduits, and cables would continue. Pumps would be installed and piped through the process facilities. Approximately five crew members would be needed for construction. Construction of each booster pump station is estimated to take approximately six months.

2.5.4 Staging Areas

At various locations within the construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. Staging areas would be established in areas near construction zones that are open and easily accessed (e.g., vacant lots). In some cases, staging areas may be used for the duration of the NBWRP construction phase. In other cases, as pipeline construction moves along the route, the staging area may be moved along and within the route to minimize hauling distances and avoid disrupting any one area for extended periods of time. Contractors are expected to negotiate short-term temporary easements for staging areas. The location of the staging areas would be determined by the contractor and would typically be located every 3 miles along the pipeline alignment. Generally, the staging areas would be located in paved, previously disturbed, or other non-vegetated areas with protection barriers to adjacent sensitive areas. The maximum size of these staging areas would be approximately 1 acre. Additional staging areas could be located within the 25-foot construction corridor along the pipeline alignment. Staging areas would avoid wetlands and riparian areas.

2.5.5 Construction Equipment

Construction would involve grading, excavation, structural erection, and backfilling at the NBWRP Phase 2 sites. Energy efficient equipment would be used wherever feasible. Heavy construction could include the following equipment:

1. Tunnel boring machine
2. Pavement saw
3. Jack hammers
4. Back hoe
5. Front-end loaders
6. 10-wheel dump trucks
7. Flat-back delivery truck
8. Sweepers
9. Compactor
10. Water truck
11. Trench shields
12. Air compressors
13. Concrete trucks
14. Concrete pumper trucks
15. Welding trucks
16. Side boom pipe handler tractor
17. Crane
18. Bulldozers
19. Excavators
20. Road grader (for widening at detours along shoulders)
21. Paving equipment: trucks, paving machine, rollers
22. Earth movers

2.6 Program Implementation Schedule

It is anticipated that the NBWRP Phase 2 will be implemented over a 6-year timeframe between 2018 and 2023. Individual project implementation and sequencing will be dependent upon design, permitting, and funding schedules. The majority of individual projects would be completed within 6-8 months. For larger projects or programs, facility construction would be phased for funding and contractor bid purposes. A general schedule is presented in **Figure 2-29** (**Appendix A**).

2.7 Operation and Maintenance

The NBWRP Phase 2 would involve operation and maintenance of the proposed facilities that would be integrated with operations and maintenance schedules of the individual Member Agencies. Facilities would be operations to meet user demands provided for under Title 22 and would include both seasonal and year-round operations.

2.7.1 Maintenance

Currently, Member Agency staff perform inspections and preventative maintenance of water recycling facilities including pump stations; electrical control equipment; tide and slide gates; motor control center; valves and appurtenances; and pond floats and cell sites. Staff at the WWTPs would perform similar inspections and preventative maintenance of the proposed recycled water pipelines, storage reservoirs, and pump stations.

CHAPTER 3
Environmental Consequences

3.1 Introduction

This chapter describes the affected environment (or environmental setting) for various environmental resources and resource considerations, the applicable regulatory framework, as well as the direct, indirect and cumulative impacts of NBWRP Phase 2 and alternatives. More specifically, this chapter evaluates the impacts of a No Project Alternative (a "no build" scenario used as the CEQA baseline relative to which project-related changes are measured), No Action Alternative (a "future without the project scenario" used as the NEPA baseline), NBWRP Phase 2 (also referred to as the Proposed Action for purposes of NEPA), and the Storage Alternative to NBWRP Phase 2. Impacts are summarized in each of the resource sections in accordance with the service areas of each of the NBWRA's individual Member Agencies.

As discussed in Chapter 1, *Introduction*, the level of significance of the change resulting from NBWRP Phase 2 or an alternative is determined relative to established thresholds for purposes of CEQA. In case of any potentially significant impact, one or more mitigation measures are identified that would avoid or minimize the impact to a less-than-significant level. Determinations of significance made in this EIR/EIS apply only to CEQA, not to NEPA, which does not require such determinations to be made in an EIS.

In compliance with the recently published Secretary of the Interior Order Number 3355: Streamlining NEPA Reviews and Implementation of Executive Order 13807, "Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects," this document has been structured such that to the extent feasible, content is provided in a concise form. The document employs various formatting tools that allows the reader to obtain an informed understanding of the resource issues, focus on the analysis that is in some cases incorporated by reference, or otherwise presented in tabular or appendix form. This approach is consistent with the goal of ensuring that information regarding environmental impacts is available to the public and decision makers, in an appropriate level of detail while also adhering to page limits, per Section 4 (a) 1 Directive of Order 3355 (43 C.F.R. 46.405, and 40 C.F.R. 1500.4 and 1502.7). These orders limit the number of pages of an EIS to 150 pages, with an allowance of up to 300 pages for "complex" projects, such as the NBWRP Phase 2. In order to meet this requirement, many elements typically included in the body of an EIR/EIS have been shifted to appendices, which do not figure into the page limit.

3.1.1 Impact Terminology

This is a joint EIR/EIS, prepared under the direction of SCWA as the state lead agency and the Bureau of Reclamation as the federal lead agency. Both agencies have obligations to disclose the environmental consequences of their decisions. Under CEQA and NEPA, the terms "effects" and "impacts" may be used synonymously (40 C.F.R. §1508.8; CEQA Guidelines §15358).

This EIR/EIS uses the following terminology to describe the environmental consequences of the alternatives analyzed:

(a) **Direct Impacts.** The analysis of direct impacts focuses on the temporary and permanent impacts resulting from implementation of NBWRP Phase 2 and alternatives in the project area.

(b) **Indirect Impacts.** The analysis of indirect/secondary impacts from implementation of NBWRP Phase 2 and alternatives focuses on those reasonably foreseeable impacts that are caused by the NBWRP Phase 2 or an alternative and are later in time or farther removed in distance.

(c) **Cumulative Impacts.** Under CEQA, "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines §15355). CEQA requires that cumulative impacts be discussed when the "project's incremental effect is cumulatively considerable" (CEQA Guidelines §15130(a)). NEPA regulations define "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 C.F.R. §1508.7). NEPA states, "[c]umulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. §1508.7). In this EIR/EIS, the analysis of cumulative impacts resulting from all of the alternatives analyzed in detail is included in Chapter 4.

3.1.2 CEQA and NEPA Baselines

As a joint EIR/EIS, the impact analysis considers two baselines: the CEQA baseline standard, which requires a review of project impacts in terms of the resulting "change from existing conditions," as well as the NEPA baseline standard, which requires a comparison of impacts relative to future conditions without the project/alternative. Typically, the CEQA impact analysis will include the NEPA increment of impact, as the CEQA analysis requires a broader comparison between existing conditions and post-project conditions. Where appropriate, the NEPA increment of impact between the No Action Alternative and the Project Alternatives will be identified.

Briefly, under the No Project Alternative, none of the project components would be implemented. The CEQA impact discussion considers the difference between existing conditions (No Project Alternative) and implementation of each action alternative (i.e., NBWRP Phase 2 and Storage Alternative). For the purposes of NEPA, project impacts are defined as the difference between the No Action Alternative and an action alternative. Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of projects would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project 1 – Distribution (Novato SD), Turnout to Wetlands (Novato SD), Urban Recycled Water Expansion (Petaluma), and the first phase of American Canyon's Recycled Water Distribution System Expansion. Given the differences in points of comparison, it is anticipated that the NEPA impacts would differ slightly from the CEQA impacts. Because the impacts under NEPA are within the range of project impacts identified in the CEQA analysis, and would not exceed those impacts or result in additional mitigation measures beyond those already identified under CEQA, they have not been quantified or specifically called out in the majority of impact discussions. Where warranted, the NEPA impact increment is separately defined and discussed. Determinations of significance of impacts in this EIR/EIS apply only to CEQA; where applicable, beneficial impacts are identified under NEPA. A brief analysis is provided per resource of impacts under such a "No Action" scenario.

3.1.3 Cumulative Scenario

This EIR/EIS identifies past, present, and reasonably foreseeable future actions by applying a blend of two approaches: a "list-of-projects" approach that identifies known actions that could cause similar types of environmental impacts as the alternatives analyzed in detail and a "summary of projections" approach that considers projections made in one or more local, regional, or statewide planning documents or environmental analysis that has been adopted or certified.

The potential for project-generated impacts to contribute to a significant cumulative impact would arise if the impacts are located within the same geographic area. This geographic area may vary, depending upon the issue area discussed and the geographic extent of the potential impact. For example, the geographic area associated with construction noise impacts would be limited to areas directly affected by construction noise, whereas the geographic area that could be affected by construction-related air emissions may include a larger area. In general, impacts associated with the implementation of NBWRP Phase 2 are limited to short-term construction impacts. Long-term impacts are limited to beneficial impacts to water supply associated with recycled water treatment and distribution. Construction impacts associated with aesthetics, increased noise, dust, erosion, and access limitations tend to be localized and could be exacerbated if other development or improvement projects are occurring within the vicinity of proposed facilities. The geographic scope may vary for each issue area depending on the nature of the cumulative impacts. When considered cumulatively with other projects that may occur in the same geographic vicinity, the scope of analysis is defined by the physical boundaries for each issue area. Therefore, cumulative impacts to water quality would occur within the watershed. For this cumulative analysis, the two geographic boundaries that capture the majority of these impacts are the North San Pablo Bay watershed and the Bay Area Air Basin. Relevant geographic areas of consideration are identified on a resource-by-resource basis throughout this Chapter 3.

In addition to the geographic scope, cumulative impacts are determined by an overlap in timing of the contributing projects. Schedule is particularly important: for a group of projects to combine to cause or contribute to cumulative impacts, they must be temporally as well as spatially proximate.

3.2 Geology, Soils, Mineral Resources, and Paleontological Resources

This section describes the existing geology, soil conditions, seismicity, and mineral and paleontological resources in the project area in Section 3.2.1, *Affected Environment*. Section 3.2.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. All figures referred to in this section are available in Appendix A. Setting information and the Regulatory Framework that governs these resources are presented in Appendix 3.2A. During scoping for this EIR/EIS, no geology, soil conditions, and seismicity-related concerns were raised by the public or responsible agencies. No comments or other input were received regarding mineral or paleontological resources.

3.2.1 Affected Environment

3.2.1.1 Regional Setting

Geology

The project area is located within the geologically complex region of California referred to as the Coast Range Geomorphic Province. Much of the Coast Range province is composed of marine sedimentary deposits and volcanic rocks that form northwest trending mountain ridges and valleys, running subparallel to the San Andreas Fault Zone. Bedrock geology in this region consists primarily of greywacke, shale, greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments. These Franciscan units are overlain in areas by volcanic cones and flows of the Quien Sabe, Sonoma, and Clear Lake volcanic fields.

The Coast Range Province is divided into a northern and southern half with the San Francisco Bay as the dividing boundary. The San Francisco Bay lies within a broad depression created from an east-west expansion between the San Andreas and the Hayward fault systems. The San Andreas fault zone runs roughly parallel to the Pacific coastline in western Marin and Sonoma Counties.

Seismicity

The seismic environment in Northern California and the San Francisco Bay Area (Bay Area) is characterized by the San Andreas Fault system, which formed due to major forces occurring at the boundary of shifting tectonic plates. This fault system, and its northwest-trending folds and faults, control much of the geologic structure within the northern Coast Ranges. The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities (WGCEP) estimated that there is a 6.4 percent chance of the Northern San Andreas Fault experiencing an earthquake of magnitude 6.7 or greater in the next 30 years (WGCEP, 2015).

Regional Faults

The Bay Area region contains both active and potentially active faults and is considered a region of high seismic activity.[1] Throughout the project area there is a potential for damage from movement along any one of a number of the active Bay Area faults. The WGCEP estimates that there is a 72 percent probability of at least one moment magnitude 6.7 or greater earthquake occurring in the San Francisco Bay region over the next 30 years (WGCEP, 2015).[2] Within the 72 percent probability, the Hayward-Rodgers Creek,[3] Calaveras, and San Andreas fault systems are the three most likely to cause such an event.

Figure 3.2-1 (in Appendix A) depicts active faults in the vicinity of NBWRP Phase 2 including the Hayward-Rodgers Creek fault zone and the San Andreas fault zone. **Table 3.2-1** lists these faults along with other potentially active fault systems, and identifies the dates of their most recent activity and the estimated maximum moment magnitude of a characteristic future event. The distance listed to the various faults represents the shortest distance to the project area. One of the regional active faults, the West Napa fault, is located within the project area.

1 An "active" fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 11,000 years). A "potentially active" fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive (Hart and Bryant, 1997).

2 Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (California Geological Survey [CGS], 2002).

3 The Rodgers Creek fault is considered to be a northern extension of the Hayward fault, which has not been mapped beneath San Pablo Bay.

TABLE 3.2-1: ACTIVE AND POTENTIALLY ACTIVE REGIONAL FAULTS IN THE VICINITY OF THE NBWRP PHASE 2 AREA

Fault Zone	Location Relative to Project Area	Recency of Faulting[a]	Historical Seismicity[b]	Maximum Moment Magnitude[d]
Burdell Mountain	Within Area of Novato SD	Potentially Active	NA	NA
Rodgers Creek (includes potentially active Healdsburg and Tolay fault zones)	Tolay fault within Area of Petaluma Ellis Creek WRF	Historic – Active (Rodgers Creek), Potentially Active (Tolay fault)	M 6.7: 1898 M 5.6, 5.7: 1969	7.0
San Andreas (Peninsula and Golden Gate segments)	10 miles west of MMWD	Historic – Active	M 7.1: 1989 M 8.25: 1906 M 7.0: 1838 Many <M 6	7.3
Hayward	3 miles east of Petaluma Ellis Creek WRF	Historic – Active	M 6.8: 1868 M 7.0: 1838 Many <M 4.5	6.9
West Napa	Within Area of American Canyon and Napa SD	Historic –Active	M 6.0: 2014	6.5
Bloomfield	6 miles northwest of Petaluma Ellis Creek WRF	Potentially Active	NA	NA
Soda Creek	Within Area of Napa SD	Potentially Active	NA	NA
Concord-Green Valley (includes Cordelia Fault Zone)	5.5 miles east of American Canyon	Holocene – Active	Active creep[c]	6.9
Maacama	16 miles north of Petaluma Ellis Creek WRF	Holocene – Active	NA	7.1
Marsh Creek-Greenville	20 miles southeast of American Canyon	Historic – Active	M 5.6: 1980	6.9
Calaveras	24 miles southeast of American Canyon	Historic – Active	M 6.1: 1984 M 5.9: 1979 Many <M 6.5	6.8

NOTES:

[a] Recency of faulting from Jennings (1994). Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).

[b] Richter magnitude (M) and year for recent and/or large events.

[c] Slow fault movement that occurs over time without producing an earthquake.

[d] Maximum moment magnitude from Peterson *et al.* (1996). This is the maximum earthquake moment magnitude which could occur within the specified fault zone.

NA = Not applicable and/or not available; WRF = Water Recycling Facility

SOURCES: Jennings 1994; Hart and Bryant 1997; Peterson *et al* 1996; USGS 2014.

Large historic earthquakes (magnitude 6 and greater) on regional active faults have been responsible for generating significant ground shaking throughout the region including events on the Rodgers Creek fault (1886, 1965), San Andreas (1906, 1989) and the Maacama fault (1906). The Rodgers Creek fault is considered the northern extension of the Hayward fault and is capable of causing significant ground shaking from Vallejo to north of Healdsburg. The most recent significant earthquake on the Rodgers Creek fault occurred in October 1, 1969. On this date, two earthquakes of magnitude 5.6 and 5.7 occurred in an 83-minute period and caused serious damage to buildings in Santa Rosa. The last major earthquake (estimated Richter magnitude 6.7) was generated in 1898 with an epicenter near Mare Island at the north margin of San Pablo Bay. The USGS estimates the probability of a large earthquake (magnitude 6.7 or greater) on the Rodgers Creek fault (when considered together with the Hayward fault) during the period between 2014 and 2044 to be 14.3 percent (WGCEP, 2015). The expected ground shaking generated by a seismic event on the Rodgers Creek Fault is anticipated to cause significant damage and interruption of service for transportation (e.g., highways, railroads, and marine facilities) and lifeline (e.g., water supply, communications, and petroleum pipelines) facilities throughout the North Bay region.[4]

[4] For purposes of this discussion, the North Bay region is defined as Marin, Sonoma, Napa, and Solano counties.

Shaking Intensity

While the moment and Richter magnitudes are a measure of the energy released in an earthquake, intensity is a measure of the earthquake ground shaking effects at a particular location. Intensity varies depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material underlying a particular area. The Modified Mercalli (MM) Intensity scale (provided as **Table 3.2-2 in Appendix 3.2A**) is commonly used to express the earthquake intensity and damage severity caused by earthquakes because it expresses ground shaking relative to actual physical effects observed by people and therefore is a useful scale for comparing different seismic events. MM values range from I (earthquake not felt) to XII (damage nearly total). Earthquakes on the various active and potentially active San Francisco Bay Area fault systems can produce a wide range of ground shaking intensities within the project area.

The closest active faults to the project area are the Rodgers Creek fault and the West Napa fault. The West Napa fault transects the American Canyon project components and lies immediately to the west of the Napa SD components at the Soscol Water Recycling Facility (Soscol WRF). The Rodgers Creek fault trends to the northwest from San Pablo Bay (east of where the Petaluma River enters the Bay) to Healdsburg and last displayed significant activity in 1969. The West Napa fault is located east of the Napa River and trends northwest across the Napa County Airport. A magnitude 6.0 earthquake, along with various aftershocks, occurred on the West Napa fault on August 24, 2014 (USGS 2014).

Potentially active faults within the project area include the Tolay, Burdell Mountain, Americano Creek, Bloomfield, Carneros and Soda Creek faults. Geologic evidence suggests that there may have been relatively recent movement on the Burdell Mountain fault zone, suggesting that it might be considered active rather than potentially active (County of Marin, 2005). However, no official change has been made by the California Geological Survey (CGS). Seismic events along any of these potentially active faults could possibly be triggered by activity within other active faults in the region, such as the Hayward-Rodgers Creek, San Andreas, West Napa, and/or Concord-Green Valley fault zones.

Additional discussion of Seismic Ground Shaking, Topography, Potential Geologic and Seismic Hazards is provided in **Appendix 3.2A.**

3.2.1.2 Local Geology and Soils

Soil mapping by the USDA National Resource Conservation Service (NRCS), Soil Conservation Service, was reviewed for information about unsuitable characteristics of surface and near-surface subsurface soil materials. A review of GIS spatial and tabular data for the Marin, Sonoma, and Napa counties survey areas provided information for surface and shallow subsurface soil materials (NRCS, 2013, 2014a, and 2014b). Soils occurring within the service areas are summarized in **Appendix 3.2A**.

3.2.1.3 Mineral Resources

The CGS (formerly the Division of Mines and Geology) classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 (SMARA, Pub. Res. Code §§2710-2796). Mineral Resource Zones (MRZ) have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows and are discussed for each project service area below:

> ***MRZ-1*:** Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.
>
> ***MRZ-2*:** Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
>
> ***MRZ-3*:** Areas containing mineral deposits the significance of which cannot be evaluated from available data.
>
> ***MRZ-4*:** Areas where available information is inadequate for assignment to any other MRZ.

Novato SD. The CGS has designated the entire Novato SD project area as a MRZ-1 zone.

SVCSD. The eastern portion of the proposed SVCSD Napa Road Pipeline project is unclassified, while the western portion is classified as a MRZ-1 zone.

SCWA. The CGS has not identified MRZs in the SCWA project area.

MMWD. The CGS has designated the MMWD project area as a MRZ-1 zone at San Quentin Prison and the CMSA WRP and a portion of the distribution pipeline as a MRZ-4 zone.

Napa SD. The CGS has mapped the Soscol WRF and the western portion of the Napa State Hospital Storage pipeline project as a MRZ-1 zone. The eastern portion of the pipeline and the storage tank site are mapped as a MRZ-2 (a) zone for stone. The MRZ-2 zone is associated with the active Napa Quarry located southeast of the City of Napa (Napa County, 2005).

Petaluma. The Petaluma project area is classified as a MRZ-1 zone for the two northern most urban recycled water expansion pipelines. The southern urban recycled water expansion pipeline, Ellis Creek WRF, and Agricultural Recycled Water Expansion have not been classified by the CGS.

American Canyon. The project area within the City of American Canyon is classified as MRZ-1 zone for all components except the southeast most pipeline, which is classified as a MRZ-3 (d) zone. The MRZ-3 (d) zone is a Franciscan Complex sheared shale and graywacke.

3.2.1.4 Paleontological Resources

Paleontological resources are the fossilized remains or impressions of plants and animals, including vertebrates (animals with backbones; mammals, birds, fish, etc.), invertebrates (animals without backbones; starfish, clams, coral, etc.), and microscopic plants and animals (microfossils). They are valuable, nonrenewable, scientific resources used to document the existence of extinct life forms and to reconstruct the environments in which they lived. Fossils can be used to determine the relative ages of the depositional layers in which they occur and of the geologic events that created those deposits. The age, abundance, and distribution of fossils depend on the geologic formation in which they occur and the topography of the area in which they are exposed. The geologic environments within which the plants or animals became fossilized usually were quite different from the present environments in which the geologic formations now exist.

In the context of CEQA, fossils of land dwelling and marine vertebrates, their environment, and associated geological, stratigraphical, taphonomical, and geographical data are considered important (i.e., significant) paleontological resources. Such fossils typically are found in river, lake, and bog deposits, although they may occur in nearly any type of sedimentary sequence.

Novato SD (Project-Level RWF Treatment Capacity Expansion), Petaluma Ellis Creek WRF, SVCSD, SCWA (Valley of the Moon ASR Programmatic), Napa SD (Project-level)

NBWRP Phase 2 would largely consist of the construction of various pipelines which would mostly occur within existing roadways or urbanized areas. The improvements to the WWTPs and construction of pump stations and storage facilities would occur mostly within existing facilities and thus would have no potential for paleontological resources.

MMWD, Novato SD (Marin County Lower Novato Creek-Distribution & Turnout to Wetlands Project-Level; Programmatic), SCWA (Sonoma ASR Programmatic), Napa SD (Programmatic)

Lengths of 186 feet of the distribution pipeline connecting into the CMSA WRP (Project-level) for the MMWD project, 55 feet of pipeline connecting into the existing water tank for the Sonoma ASR (Programmatic) for the SCWA project, and 308 feet of the pipeline to the Napa State Hospital Storage Tank for the Napa SD project would not be located on existing roadways. The portion of distribution pipeline for MMWD not on existing roadway would be underlain by mélange terrane Franciscan Complex and the pipelines for the SCWA Sonoma ASR (Programmatic) and Napa SD not on existing roadways would be underlain by Sonoma Volcanics (Brown and Caldwell, 2017). Mélange terrane and volcanics are considered to have no potential for paleontological resources.

The Novato SD Marin County Lower Novato Creek- Distribution, Turnout to Wetlands, and the Novato SD Programmatic Projects would mostly not be within existing paved areas. However, these projects would be underlain by Bay Mud and artificial fill, which would have no potential for paleontological resources.

3.2.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Geology, Soils, Mineral Resources, and Paleontological Resource issues and used to determine the significance criteria presented in Section 3.2.3.1 is found in **Appendix 3.2A**.

3.2.3 Direct and Indirect Effects

3.2.3.1 Significance Criteria under CEQA

Geology, Soils, and Seismicity

Based on the Appendix G of the CEQA Guidelines as modified consistent with the state Supreme Court's decision in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, project implementation would have significant impacts and environmental consequences related to geology, soils, and seismicity if it would:

1. Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving an exacerbation of existing risks related to earthquake rupture, strong seismic ground shaking, seismic related ground failure including liquefaction, and landslides;

2. Result in substantial soil erosion or the loss of topsoil;
3. Be located on a geologic unit or soil that becomes unstable as a result of the project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse for reasons caused or exacerbated by the project; or
4. Be located on expansive soil creating or exacerbating substantial risks to life or property.

Because neither NBWRP Phase 2 nor any of the alternatives proposes or would necessitate the use of waste water sewers, septic tanks, or alternative waste water disposal systems, no impact would result with respect to CEQA Guidelines Appendix G Geology and Soils consideration e) regarding the support capacity of affected soils. Therefore, this issue is not discussed further.

Mineral Resources

For this EIR, a project is considered to have a significant impact related to mineral resources if it would:

1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
2. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Paleontological Resources

Based on the Appendix G of the CEQA Guidelines, project implementation would have significant impacts and environmental consequences on paleontological resources if it would result in any of the following:

1. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.2.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage Alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 mile of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within member agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water and 1.8 miles of pipeline in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.2.1: Seismicity. In the event of a major earthquake in the Bay Area Region, the proposed facilities would not exacerbate existing risks related to fault rupture, severe ground shaking, liquefaction, or earthquake induced landslides capable of causing injury, structural damage, pipeline rupture and service interruption. (No Impact)

As discussed above in Section 3.2.1, *Affected Environment*, it is likely that at least one moderate to severe earthquake will occur in the next 30 years cause strong ground shaking within the NBWRP Phase 2 vicinity. With regard to potential impacts resulting from seismic activity, the following actions would exacerbate risks associated with seismicity in the area encompassing the NBWRP Phase 2: building of a dam or reservoir, injecting water into the ground, substantial liquid extraction (including water or oil), or the placement of an extremely large structure.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, these components would not propose any of the exacerbating actions listed above; therefore, there would be **no impact** related to the exacerbation of seismicity.

Proposed Action

NBWRP Phase 2 would include new construction, modification, and expansion of existing facilities. These facilities include increased filter capacity and upgrades at existing treatment facilities, conveyance pipelines and appurtenances, and covered storage. None of the NBWRP Phase 2 components would be located at a site that would create any of the exacerbating actions listed above; therefore, there would be **no impact** related to the exacerbation of seismicity due to the Proposed Action.

Program Elements

The NBWRP Phase 2 Program Elements would include conveyance pipelines and appurtenances, seasonal and operational storage, environmental enhancement, and aquifer storage and recovery projects. None of the NBWRP Phase 2 Elements would be located at a site that would create any of the exacerbating actions listed above; therefore, there would be **no impact** related to the exacerbation of seismicity due to NBWRP Phase 2.

Storage Alternative

As presented above, the Storage Alternative would include new construction or modification and expansion of existing facilities. These facilities include increased filter capacity and upgrades at existing treatment facilities, conveyance pipelines and appurtenances, and seasonal storage. None of the Storage Alternative elements would be located at a site that would create any of the exacerbating actions listed above; therefore, there would be **no impact** related to the exacerbation of seismicity due to the Storage Alternative.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.2.2: Erosion. Project construction activities could result in short-term erosion and loss of topsoils. (Less than Significant)

Construction would require significant ground disturbing activities that include excavation, stockpiling removed soils, and placement of imported fill materials or reuse of excavated soils. Construction of the pipelines would primarily use the open-trench across open land and/or trenchless techniques at stream crossings or in other cases to minimize disruption (e.g., heavily travelled roadways). Both would involve excavation of existing soils and stockpiling them in dedicated areas. If not managed correctly, the soils disturbed by earthwork and construction activities, as well as stockpiled materials for use in the construction, would be susceptible to the effects of wind- or water-induced erosion and loss of topsoil.

Individual projects disturbing soil areas of 1.0 acre or more would be required to comply with the NPDES Construction General Permit. Smaller projects of less than 1.0 acre would not be expected to result in significant erosion potential. The Construction General Permit requirements were developed to ensure that stormwater is managed and erosion is controlled on construction sites. The Construction General Permit requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which requires application of best management practices (BMPs) to control runoff of water from construction sites. The BMPs could include, but would not be limited to, physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of bio-infiltration swales, protection of stockpiled materials, and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction. At the conclusion of construction, the Permit requires that all disturbed areas are restored. See **Section 3.5, *Water Quality***, for further discussion from the water quality perspective.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, these elements, with the exception of the Turnout to Wetlands, are anticipated to disturb more than 1.0 acre of ground surface. As noted in the impact analyses above, construction of these elements would be required to comply with the NPDES Construction General Permit. Therefore, through this compliance, the construction associated with the No Action Alternative would have a **less-than-significant impact** related to soil erosion during construction.

Proposed Action

Construction for the Proposed Action would require significant ground disturbing activities, as described above. These activities would occur within the existing treatment facilities, along or within road rights-of-way, or in undeveloped areas. Construction activities disturbing 1.0 acre or more of ground surface would be required to comply with the NPDES Construction General Permit.

Because Proposed Action construction activities would be subject to requirements that would control erosion, they are not anticipated to cause substantial increases in soil erosion. Therefore, through compliance with the Construction General Permit, the Proposed Action would have a **less-than-significant impact** related to soil erosion during construction.

Program Elements

Construction for the Program Elements would require significant ground disturbing activities, as described above. These activities would occur within existing facilities, along or within road rights-of-way, or in undeveloped areas. Construction activities disturbing 1.0 acre or more of ground surface would be required to comply with the NPDES Construction General Permit.

Because construction activities associated with the Program Elements would be subject to requirements that would control erosion, they are not anticipated to cause substantial increases in soil erosion. Therefore, through compliance with the Construction General Permit, the Program Elements would have a less-than-significant impact related to soil erosion during construction.

Storage Alternative

A number of the Storage Alternative elements would include new construction of pipelines and storage reservoirs. These particular facilities are anticipated to disturb more than 1.0 acre of ground surface. Construction of these elements would be required to comply with the NPDES Construction General Permit. Therefore, through this compliance, the construction associated with the Storage Alternative would have a **less-than-significant impact** related to soil erosion during construction.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.2.3: Unstable Soils. Project improvements could be located on a geologic unit or soil that can become unstable as a result of the project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse causing damage to structures and service disruptions for reasons caused or exacerbated by the project. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, these facilities would be subject to CBC requirements. With adherence to CBC requirements, the potential for a geologic unit or soil to become unstable as a result of a project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse for reasons caused or exacerbated by the No Action Alternative would be **less than significant**. Upon completion of the construction, these components would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to geologic units or soil.

Proposed Action

Construction. NBWRP Phase 2 covers a relatively large area that is characterized by relatively flat topography with no steep grades or abrupt changes in elevation. Development of any elements of the Proposed Action would be required to adhere to California Building Code (CBC) requirements that include the preparation of a site-specific geotechnical investigation by a State-licensed geotechnical engineer. The required geotechnical investigation would determine the susceptibility of the subject site to unstable conditions including landslides, lateral spreading, subsidence (settlement), liquefaction, and collapse. Compliance with the CBC would require the geotechnical investigation to identify prescribed engineering techniques for reducing the effects of any identified geotechnical hazards or unstable units for any Proposed Action elements. Where settlement and/or differential settlement is predicted, readily available site preparation measures—such as use of engineered fill, surcharging, wick drains, deep foundations, structural slabs, hinged slabs, flexible utility connections, and utility hangers—could be used. These measures would be evaluated and the most effective, feasible, and economical measures recommended in the geotechnical report and incorporated into site design in accordance with CBC requirements. Engineering recommendations included in the project engineering and design plans for construction of developments pursuant to the Proposed Action would be reviewed and approved as a condition of permit approval by the cities of San Rafael, Novato, Sonoma, Napa, and American Canyon, as well as the unincorporated county areas (e.g., San Quentin State Prison). With adherence to CBC requirements, the potential for a geologic unit or soil to become unstable as a result of a project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse for reasons caused or exacerbated by the Proposed Action would be **less than significant**.

Operations. Upon completion of the Proposed Action, the components would be located on geologic units or soil that are either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to geologic units or soil.

Program Elements

Like the Proposed Action, the Program Elements would be subject to CBC requirements. With adherence to CBC requirements, the potential for a geologic unit or soil to become unstable as a result of a project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse for reasons caused or exacerbated by any Program Elements would be less than significant. Upon completion of the construction, these elements would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to geologic units or soil.

Storage Alternative

Facilities developed under the Storage Alternative would be subject to CBC requirements. With adherence to CBC requirements, the potential for a geologic unit or soil to become unstable as a result of a project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse for reasons caused or exacerbated by the Storage Alternative would be **less than significant**. Upon completion of the construction, these components would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to geologic units or soil.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.2.4: Expansive Soils. Project improvements could be located on expansive soils creating or exacerbating substantial risks to life or property. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, these facilities would be subject to CBC requirements recommendations of a project-specific geotechnical report. With adherence to CBC requirements and the geotechnical recommendations, the potential for any No Action Alternative element to experience damage due to expansive soils would be **less than significant**. Upon completion of the construction, these elements would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to expansive soils.

Proposed Action

Construction. The potential for soil expansion, also referred to as linear extensibility or shrink swell potential, is related to changes in soil volume caused by changes in soil moisture, specifically in clayey soils. Over time, structures developed pursuant to the proposed NBWRP Phase 2 that are constructed on expansive soils could experience foundation damage as a result of seasonal expanding and contracting of soils. As discussed in Appendix 3.2B, the NRCS soil survey indicated that the NBWRP Phase 2 area is identified as having a variety of soils with low to high ratings for linear extensibility.

Building damage due to volume changes associated with expansive soils can be reduced through proper foundation design. Replacement of native soils with engineered fill, treatment of native soils, or addition of soil amendments are effective means of reducing the risk from expansive soils. As a requirement of the CBC, project applicants would be required to submit a final geotechnical investigation that includes site-specific recommendations for the mitigation of potentially expansive soils as a condition of permit approval. The site-specific analysis of site foundation soils guides the recommended building foundation design, such that damage from expansive soils is minimized and reduced to levels that can be accommodated by the final design. Treatment methods of expansive soils include removal of these soils or the addition of stabilizing chemicals such as lime. Therefore, implementation of standard geotechnical engineering practices and adherence to building code requirements would reduce potential impacts and prevent an exacerbation of substantial risk to life or property as a result of the project from expansive soils to **less than significant**.

Operations. Upon completion of the projects, the components would be located on soils that are either not expansive as is or have been treated during construction, as discussed above. Therefore, there would be **no impact** during operations relative to expansive soils.

Program Elements

Like the Proposed Action, the Program Elements would be subject to CBC requirements requiring a geotechnical investigation to inform a project's design. With adherence to CBC requirements and the geotechnical recommendations, the potential for any Program Element experience damage due to expansive soils would be **less than significant**. Upon completion of the construction,

these elements would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to expansive soils.

Storage Alternative

As noted above, the Storage Alternative elements would be subject to CBC requirements recommendations of a project-specific geotechnical report. With adherence to CBC requirements and the geotechnical recommendations, the potential for any Storage Alternative element to experience damage due to expansive soils would be **less than significant**. Upon completion of the construction, these elements would be located on geologic units or soil that is either stable as is or had been improved during construction, as discussed above. Therefore, there would be **no impact** during operations relative to expansive soils.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.2.5: Mineral Resources. The Project could result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, none of these elements would interfere with the availability of any known mineral resources. Therefore, **no impact** to mineral resources is expected.

Proposed Action

Based on the characteristics of each element of the Proposed Action and the existing conditions of the NBWRP Phase 2 area, there is no potential for an element of the Proposed Action to result in the loss of mineral resources. NBWRP Phase 2 would largely consist of the construction of various pipelines which would mostly occur within existing roadways. The improvements to the WWTPs and construction of pump stations and storage facilities would occur either within or immediately adjacent to existing facilities and new groundwater and monitoring wells would be built in previously disturbed areas. They would not interfere with the availability of any known mineral resources. Therefore, **no impact** to mineral resources is expected as result of the Proposed Action.

Program Elements

With the single exception discussed below, based on the characteristics of each Program Element and the existing conditions of the NBWRP Phase 2 area, there is no potential for an element to result in the loss of mineral resources. NBWRP Phase 2 would largely consist of the construction of various pipelines which would mostly occur within existing roadways. The improvements to the construction of pipelines, pump stations and storage facilities would occur either within or immediately adjacent to existing facilities and new groundwater and monitoring wells would be built in previously disturbed areas. They would not interfere with the availability of any known mineral resources. Therefore, **no impact** to mineral resources is expected as result of these Program Elements.

Project construction activities for the Napa SD Napa State Hospital Storage Tank Program Element would be conducted in an area mapped by the California Mineral Land Classification system as MRZ-2 (a). This mineral resource classification delineates areas where significant mineral deposits are believed to be present, as evidenced by the nearby active Napa Quarry. Project construction activities would not impede active mining operations. None of the components of this Program Element would be located such that access to the quarry would be impeded or that would otherwise preclude future mining activities. Therefore, this impact attributable to the Napa State Hospital Storage Tank Program Element would be **less than significant**.

Storage Alternative

Based on the characteristics of each element of the Storage Alternative and the existing conditions of the NBWRP Phase 2 area, there is no potential for an element to result in the loss of mineral resources. Some elements would largely consist of the construction of various pipelines, which would mostly occur within existing roadways. The improvements to the construction of pipelines, pump stations and storage facilities would occur either within or immediately adjacent to existing facilities. They would not interfere with the availability of any known mineral resources. Therefore, **no impact** to mineral resources is expected as result of the Storage Alternative.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.2.6: Paleontological Resources. The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (No Impact)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, there would be no construction in areas that have a potential for paleontological resources. Therefore, there would be **no impact** to paleontological resources.

Proposed Action

Elements of the Proposed Action would largely consist of the construction of various pipelines, which would mostly occur within existing roadways where the materials would consist of fill and previously disturbed materials with no paleontological resources or unique geologic features. The improvements to the WWTPs and construction of pump stations and storage facilities would occur mostly within existing facilities and would have a no potential paleontological resources.

Some segments of pipeline, however, would be constructed in areas not paved or previously disturbed. The Proposed Action components would be underlain by mélange terrane Franciscan Complex or Sonoma Volcanics (Brown and Caldwell, 2017). Surficial exposures of mélange and volcanics are considered to have no potential for paleontological resources. Other elements would be underlain by Holocene Bay Mud and artificial fill. Surficial exposures of Holocene Bay Mud and artificial fill are also considered to have no potential for paleontological resources. Therefore, there would be **no impact** to paleontological resources relative to the Proposed Action.

Program Elements

Program Elements would largely consist of the construction of various pipelines, which would mostly occur within existing roadways where the materials would consist of fill and previously disturbed materials with no paleontological resources or unique geologic features. The storage and environmental enhancement components, however, would be constructed in areas not paved or previously disturbed. These elements would be underlain by mélange terrane Franciscan Complex or Sonoma Volcanics (Brown and Caldwell, 2017). Surficial exposures of mélange and volcanics are considered to have no potential for paleontological resources. Other elements would be underlain by Holocene Bay Mud and artificial fill. Surficial exposures of Holocene Bay Mud and artificial fill are also considered to have no potential for paleontological resources. Therefore, there would be **no impact** to paleontological resources relative to the Proposed Action.

Storage Alternative

Elements of the Storage Alternative would largely consist of the construction of various pipelines, which would mostly occur within existing roadways where the materials would consist of fill and previously disturbed materials with no paleontological resources or unique geologic features. The improvements to the WWTPs and construction of pump stations and storage facilities would occur mostly within to existing facilities and would have a no potential paleontological resources. The storage reservoirs, however, would be constructed in areas not paved or previously disturbed. The elements would be underlain by mélange terrane Franciscan Complex or Sonoma Volcanics (Brown and Caldwell, 2017). Surficial exposures of mélange and volcanics are considered to have no potential for paleontological resources. Other elements would be underlain by Holocene Bay Mud and artificial fill. Surficial exposures of Holocene Bay Mud and artificial fill are also considered to have no potential for paleontological resources. Therefore, there would be **no impact** to paleontological resources relative to the Proposed Action.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.2.3.3 Impact Summary by Service Area

Appendix 3.2B provides a summary of potential Project impacts per Member Agency related to energy geology, soils, mineral resources, and paleontological resources.

3.3 Surface Hydrology

This section describes the existing surface hydrology in the project area in Section 3.3.1, *Affected Environment*. Section 3.3.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 Project and all alternatives (including impacts related to hydrology, drainage, and flooding), and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. All figures referred to in this section are available in Appendix A. The Local Setting and Regulatory Framework that governs these resources is presented in Appendix 3.3A. During scoping for this EIR/EIS, no surface hydrology-related concerns were raised by the public and responsible agencies.

3.3.1 Affected Environment

3.3.1.1 Regional Setting

The project areas are located within the San Pablo Bay and Central San Francisco Bay watersheds. **Figure 3.3-1 (in Appendix A)** shows the two watersheds and their sub-watersheds. The San Pablo Bay and Central San Francisco Bay watersheds are within a tectonically active area, as discussed further in **Section 3.2*, Geology, Soils, Mineral Resources, and Paleontological Resources***.

The San Pablo Bay watershed is approximately 900 square miles in area. Mount St. Helena is located to the north of San Pablo Bay watershed with the Howell Mountains in Napa and Solano counties, the Carquinez Strait, and the Franklin Ridge, the Briones Hills, and the northern portion of the East Bay Hills in Contra Costa County to the east. The western border is defined by a series of small mountains and hilltops including: Loma Alta and Red Hill in Marin County; Meacham Hill, Sonoma Mountain, Bennet Mountain, and Mt. Hood in Sonoma County; and the Mayacamas Mountains along the northern border of Napa and Sonoma counties. San Pablo Bay receives freshwater inflow from this watershed as well as from the Sacramento-San Joaquin Delta. San Pablo Bay has brackish water and receives tidal inflows of salt water twice daily from San Francisco Bay.

The Central San Francisco Bay is an approximately 1,100 square mile region of the larger San Francisco Bay (Bay) Estuary. The Central San Francisco Bay conveys waters of the Sacramento and San Joaquin rivers from the east, as well as smaller streams tributary to this portion of the Bay, into the Pacific Ocean through the Golden Gate channel. Salinity levels range from hypersaline to fresh water, and water temperature varies throughout the Bay system (San Francisco Bay Regional Water Quality Control Board [RWQCB], 2017). The southernmost NBWRA Phase 2 sites are adjacent to the Central San Francisco Bay approximately 8 miles north of the Golden Gate channel.

Surface water runoff creates the majority of freshwater flows within the rivers and streams in these two watersheds. Consequently, streamflow in all of the creeks and rivers varies greatly with the season and the year depending on precipitation. Several smaller tributaries are naturally dry during the summer, while in others flows vary between wet and dry years. The withdrawal of water from streams for both agricultural and domestic uses has affected flow rates in the streams.

Lower base flow rates occur in the streams as a result of water storage in reservoirs and direct withdrawals from the streams and aquifers.

The wastewater treatment plants (WWTPs) within the region contribute treated effluent to major drainages to the Bay, with discharge restricted to wet months of the year for all WWTPs except the Central Marin Sanitation Agency (CMSA) plant. Discharge is restricted during the dry season to prevent insufficient dilution of the discharge. **Table 3.3-1** summarizes monthly WWTP discharges in 2016.

Tsunamis and Seiche

In 2009, the California Geological Survey, California Emergency Management Agency, and the Tsunami Research Center at the University of California completed the state's official tsunami inundation maps. Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis can travel at speeds up to 700 miles per hour and are typically only 1 to 3 feet high in open ocean water but may increase in height to up to 90 feet as they reach coastal areas, potentially causing large amounts of damage when they reach land.[1] Low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled but are still at or near sea level are generally the most susceptible to tsunami inundation.

Most of the project components would be outside of any potential tsunami inundation zone. The only project component that would be within a potential tsunami inundation zone is the MMWD San Quentin Prison Recycled Water Distribution System. The portion of the pipeline along Levee Road to the terminus of the pipeline would be within a potential tsunami inundation zone (CalEMA, 2009).

[1] City and County of San Francisco, Emergency Response Plan, an Element of the CCSF Emergency Management Program, Tsunami Response Annex, March 2011, p. 21. Available at http://www.sfdem.org/ftp/uploadedfiles/DEM/PlansReports/TsunamiAnnex-2008.pdf. Accessed on November 28, 2015.

TABLE 3.3-1: EXISTING 2016 MONTHLY WATER DISCHARGE BY WWTP (AF/MONTH)

	Napa	Sonoma	Petaluma	American Canyon	Novato	CMSA-	Total
January	1,405	538	753	168	-	1,647	-
February	940	291	363	116	-	764	-
March	1,456	585	650	212	-	1,673	-
April	867	253	299	97	-	695	-
May	0	202	0	0	-	597	-
June	0	167	0	0	-	531	-
July	0	190	0	12	-	524	-
August	0	140	0	0	-	539	-
September	0	172	0	0	-	499	-
October	0	212	600	0	-	37	-
November	1,308	258	470	86	-	880	-
December	1,098	402	549	113	-	1,484	-
Total	**7,073**	**3,410**	**3,684**	**804**	**5,276**	**9,870**	**30,117**

SOURCE: SWRCB, 2017. Totals may not add due to rounding. Novato SD value calculated based on annual average effluent flow of 4.71 mgd. Sonoma values are total effluent produced, and thus represent a potential maximum discharge amount; discharge to Schell Slough is prohibited unless the influent flow is greater than 6 mgd and the recycled water storage ponds are at greater than 50 percent capacity.

A seiche is caused by oscillation of the surface of an enclosed body of water such as San Pablo Bay due to an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up. However, there is no record of any substantive seiche waves occurring within the San Pablo Bay.

3.3.1.2 Local Setting

A discussion of local hydrologic settings within each of the service areas is provided in **Appendix 3.3A. Surface Hydrology**.

3.3.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Surface Water issues and are used to determine the significance criteria presented in **Section 3.3.3.1** can be found in **Appendix 3.3A**.

3.3.3 Direct and Indirect Effects

3.3.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines as modified consistent with the state Supreme Court's decision in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, NBWRA Phase 2 or an alternative would have significant impacts to surface hydrology if it would:

1. Substantially alter the existing drainage pattern of the site or area (including through the alteration of the course of a stream or river or by substantially increasing the rate or amount of surface runoff) in a manner that would result in substantial erosion or siltation on- or off-site;
2. Substantially alter the existing drainage pattern of the site or area (including through the alteration of the course of a stream or river or by substantially increasing the rate or amount of surface runoff) in a manner that would result in flooding on- or offsite;
3. Create or contribute substantial runoff that would exceed the capacity of existing or planned stormwater drainage systems;
4. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
5. Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
6. Cause or exacerbate the exposure of people or structures to a substantial risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
7. Cause or exacerbate any existing risk of inundation by seiche, tsunami, or mudflow.

Groundwater impacts are discussed in **Section 3.4**, ***Groundwater***. Water Quality impacts are discussed in **Section 3.5**, ***Water Quality***. The NBWRP Phase 2 would not involve housing, therefore the impact related to placing housing within the one percent annual chance of exceedance flood hazard area is not discussed further.

3.3.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action and Storage Alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is likely that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.3.1: Changes in drainage patterns. Project construction and operation could alter the existing drainage patterns in a manner that would result in substantial erosion, siltation, or flooding on- or off-site. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

For purposes of this analysis, it is assumed that future baseline (2035) rainfall intensity conditions would be similar to existing conditions.[2] Because the individual recycling projects would consist of similar components (installation of pipelines, upgrades to existing treatment facilities, and reductions in treatment facility discharge), the impacts of the No Project/No Action Alternative would be similar to, but proportionally reduced from, those identified for the NBWRP Phase 2. With implementation of **Mitigation Measures 3.5.1 and 3.3.1a**, the impacts of the No Action Alternative would be **less than significant**.

Proposed Action

Construction activities could result in temporary disturbance and exposure of soils. Exposed soil from stockpiles and excavated areas could be transported by wind or stormwater and, if not properly managed, could accumulate in watercourses or storm drains. The accumulated soil could increase the sediment load (turbidity) in the stormwater runoff as well as reduce the flood carrying capacity of the watercourses. Temporary storage of construction materials and equipment in work areas and staging areas also creates the potential for a release of sediment to watercourses. Excavation and grading activities outside of paved areas, or activities such as staging or equipment use in areas outside of existing paved streets, during construction could erode earth materials and cause downstream siltation, affecting drainage patterns. With implementation of **Mitigation Measure 3.5.1**, discussed in **Section 3.5**, ***Water Quality***, which requires implementation of Best Management Practices (BMPs) to control sediment during construction activities, the potential impacts are **less than significant with mitigation**.

As discussed in **Section 2.10.1**, NBWRP Phase 2 would include construction of treatment plant upgrades, pipelines and storage facilities that would have the potential to alter existing drainage patterns in a manner that could result in substantial erosion, siltation or flooding on- or off-site. Treatment facility upgrades, including tertiary facilities and storage at Napa SD, would occur within the existing fenceline of the treatment plants, which include stormwater facilities to capture and internally route stormwater in compliance with each facility's NPDES permit requirements. Proposed facilities would be designed to be integrated with existing drainage facilities; as such, proposed facility upgrades would not alter or affect drainage patterns.

[2] While over the next 20 years larger precipitation events with warmer temperatures could occur in some areas of California, regional precipitation changes due to climate change remain difficult to determine. (California Water Plan Update 2013)

Pump stations would have the potential to create new impervious surface area; however, proposed facilities would be located within existing water recycling and reclamation facility fence lines, or integrated into local drainage systems. Pump stations would be constructed within areas that drain either to small MS4 permittee infrastructure (storm water runoff facilities) or to facilities subject to separate NPDES permits. Projects that create new contiguous impervious surface greater than 5,000 square feet would be required to comply with post construction low impact development requirements adopted by local agencies. Compliance with these local requirements would generally reduce the impacts of permanent alterations to drainage patterns to less than significant levels.

Pipeline construction would include restoration of disturbed areas to their pre-existing grade; given the limited extent of disturbance and recontouring to existing grade, drainage patterns would not be affected. During construction, Member Agencies would implement stormwater BMPs designed to reduce erosion, siltation, or flooding during construction activities, pursuant to the requirements of the Construction General Permit (CGP). As discussed in **Section 3.3.2.2**, the BMPs included pursuant to the CGP would control stormwater flows and limit erosion of disturbed earth materials. At drainage crossings, pipeline would be installed using trenchless technology, including directional drilling, jack and bore, or bridge attachment. These installation methods, which are designed to avoid impacts to stream channels, generally would not affect drainage patterns. During installation of pipelines suspended on bridges or traversing subterranean culverts, construction activities could result in temporary redirection of stormwater run-on flows, resulting in potentially significant changes to drainage patterns; implementation of **Mitigation Measure 3.3.1a**, **Stream and Drainage Crossings**, would reduce the project's effects on erosion, siltation, and flooding to less than significant levels. **Table 3.3-2** identifies stream crossings by project; only those projects potentially affecting streams are listed. Locations of stream crossings are shown on **Figures 3.3-2 through 3.3-5 (in Appendix A)**. Impacts for each facility are identified in **Table 3.3-3**.

TABLE 3.3-2: STREAM CROSSINGS BY ALTERNATIVE

	No Project Alternative	No Action Alternative	Proposed Action	Storage Alternative
Novato SD				
Marin County Lower Novato Creek Project 1	--	10 [a]	0 [a]	0 [a]
Novato SD Total	**0**	**10**	**0**	**0**
SVCSD				
Napa Road Pipeline	--	--	2	2
SVCSD Total	**0**	**0**	**2**	**2**
MMWD				
San Quentin Prison Recycled Water Distribution System	--	--	1	1
MMWD Total	**0**	**0**	**1**	**1**
Napa SD				
Storage Alternative: Jameson Ranch	--	--	--	2
Storage Alternative: Northern Loop and Eastern Extension	--	--	--	14
Napa SD Total	**0**	**0**	**0**	**16**
Petaluma				
Urban Recycled Water Expansion	--	5	5	5
Agricultural Recycled Water Expansion	--	--	6	6
Storage Alternative: Ellis Creek WRF ponds	--	--	--	2 [b]
Petaluma Total	**0**	**5**	**11**	**13**
American Canyon				
Recycled Water Distribution System Expansion	--	--	2	2
American Canyon Total	**0**	**0**	**2**	**2**
Sonoma County Water Agency				
SCWA Total	**0**	**0**	**0**	**0**
Totals by Alternative	**0**	**15**	**16**	**34**

NOTES:

[a] 10 channels are intersected by the levees proposed by Marin County. Installation of irrigation pipelines would be within the constructed embankments, and would not intersect existing drainages.

[b] The seasonal storage ponds would be built across existing drainages; the stream crossing total presented here is thus the number of drainages that would be redirected by the seasonal storage ponds, and is not related to pipeline installation.

SOURCE: National Hydrography Dataset, National Wetlands Inventory

TABLE 3.3-3: PROPOSED ACTION EFFECTS TO SURFACE WATER DRAINAGE

Proposed Action	Member Agency	Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Proposed facilities would be within the fence line of internally draining WRFs. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce impacts to **Less than Significant**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	CMSA	
Pipeline Projects		
Marin County Lower Novato Creek Project 1	Marin Co.	Pipeline installation within levees would include restoration of disturbed areas to pre-project gradients. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SVCSD Napa Road Pipeline	SVCSD	Pipeline construction would include restoration of disturbed areas to pre-project gradients. Standard BMPs per SWPPP requirements and **Mitigation Measures 3.5.1** and **3.3.1a** would reduce potential impacts to **Less than Significant**.
MMWD San Quentin Pipeline	MMWD	
Petaluma Urban Water	Petaluma	
Petaluma Ag Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD Hamilton-Bel Marin Keys (BMK) Turnout	Novato SD	Turnout installation would be coordinated with BMK V Phase I Levee Installation. Releases would be coordinated with BMK V Phase 2 Restoration. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Napa SD Soscol Covered Storage	Napa SD	Proposed cover would introduce impervious surface area of 1.5 acres. Implementation of **Mitigation Measure 3.3.1b** would include integration into existing drainage infrastructure to capture and control drainage and would reduce impacts to **Less than Significant**.
Program Elements		
Novato SD Seasonal Storage	Novato SD	Short-term erosion impacts related to storage pond grading and embankment construction. Drainage channels are located adjacent to the storage site and would be protected from erosion and sedimentation by implementation of standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1**. With implementation of these measures, impacts would be **Less than Significant**.
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	These projects are designed to restore drainage patterns to encourage self-sustaining channel geometry and counteract existing erosion and sedimentation imbalances upstream. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Agricultural Recycled Water Expansion - Phase 3	Petaluma	Construction would include restoration of disturbed areas to pre-project gradients. Standard BMPs per SWPPP requirements and **Mitigation Measures 3.5.1** and **3.3.1a** would reduce potential impacts to **Less than Significant**.
Napa SD State Hospital Storage Tank and Pipeline	Napa SD	
RW5 and RW6	American Canyon	
SCWA Potable Water ASR - Valley of the Moon	SCWA	Short-term erosion and sedimentation impacts related to well installation and drilling muds. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SCWA Potable Water ASR - Sonoma	SCWA	

Program Elements

The Program Elements are anticipated to require stream crossings, mostly to accommodate distribution pipelines. Impacts attributable to the Program Elements would be of the same nature as those identified for the Proposed Action. Excavation and grading activities outside paved areas or activities, such as staging or equipment use in areas outside existing paved streets, during construction of the additional pipelines and storage facilities could erode earth materials and cause downstream siltation, affecting drainage patterns. Implementation of **Mitigation Measure 3.5.1,** discussed in **Section 3.5*, Water Quality***, requiring implementation of BMPs to control sediment during construction activities, would reduce these potential impacts to a less than significant level. Construction of the additional distribution pipelines would require additional watercourse crossings, potentially causing temporary changes in drainage patterns; these impacts would be reduced to less-than-significant levels with implementation of **Mitigation**

Measure 3.3.1a. Pipeline construction would include restoration of disturbed areas to pre-project gradients. Once operational, the storage ponds would direct incident precipitation to the distribution pipelines and would not increase runoff volumes or peak times. Projects creating new contiguous impervious surface greater than 5,000 square feet would be required to comply with post construction low impact development requirements adopted by local agencies. Compliance with these local requirements would generally reduce the impacts of permanent alterations to drainage patterns to less than significant levels. With implementation of mitigation measures, impacts of the Program Elements would be **less than significant with mitigation**.

Storage Alternative

Impacts of the Storage Alternative would be the same as those identified for the Proposed Action, along with the following impacts, which are summarized in **Table 3.3-4**. Excavation and grading activities outside of paved areas, or activities such as staging or equipment use in areas outside of existing paved streets, during construction of the additional pipelines and seasonal storage ponds could erode earth materials and cause downstream siltation, affecting drainage patterns. Implementation of **Mitigation Measure 3.5.1,** discussed in **Section 3.5, *Water Quality***, which requires implementation of Best Management Practices (BMPs) to control sediment during construction activities, would reduce these potential impacts to a less than significant level. Construction of the additional distribution pipelines would require additional watercourse crossings, potentially causing temporary changes in drainage patterns; these impacts would be reduced to less-than-significant levels with implementation of **Mitigation Measure 3.3.1a**. Pipeline construction would include restoration of disturbed areas to pre-project gradients. Once operational, the seasonal storage ponds would direct incident precipitation to the distribution pipelines and would not increase runoff volumes or peak times. However, levees surrounding basins constructed by Napa SD as part of the Storage Alternative would be built across existing drainages, potentially redirecting flows during wet weather and causing new unmanaged patterns of erosion and sediment deposition. This would be a potentially significant impact. Implementation of **Mitigation Measure 3.3.1b** would reduce this impact to less-than-significant levels by requiring that siting of ponds and levees avoid blocking existing watercourses. With implementation of mitigation measures, impacts of the Storage Alternative would be similar to those identified for the Proposed Action: **less than significant with mitigation**.

TABLE 3.3-4: STORAGE ALTERNATIVE EFFECTS TO SURFACE WATER DRAINAGE

Storage Alternative	Member Agency	Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary impacts related to construction activities would be within the fence line of existing WRFs. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce impacts to **Less than Significant**.
Pipeline Projects		
MST Northern and Eastern Loop	Napa SD	Pipeline construction would include restoration of disturbed areas to pre-project gradients. Standard BMPs per SWPPP requirements and **Mitigation Measures 3.5.1** and **3.3.1a** would reduce potential impacts to **Less than Significant**.
Seasonal Storage		
Seasonal Storage	Novato SD	Short-term erosion impacts related to storage pond grading and embankment construction. Drainage channels are located adjacent to the storage site and would be protected from erosion and sedimentation by implementation of standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1**. With implementation of these measures, impacts would be **Less than Significant**.
Seasonal Storage - Mulas	SVCSD	Short-term erosion impacts related to constructed embankments. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Ellis Creek WRF Southeast	Petaluma	Pipeline construction would include restoration of disturbed areas to pre-project gradients. Short-term erosion impacts related to constructed embankments. Standard BMPs per SWPPP requirements and **Mitigation Measures 3.5.1** and **3.3.1a** would reduce potential impacts to **Less than Significant**.
Jameson Ranch	Napa SD	Short-term erosion impacts related to constructed embankments; location of ponds could redirect drainages. Standard BMPs per SWPPP requirements and **Mitigation Measures 3.5.1** and **3.3.1c**, would reduce potential impacts to **Less than Significant**.

Mitigation Measures

Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit (in **Section 3.5, *Water Quality***)

Mitigation Measure 3.3.1a: Stream and Drainage Crossings. The Member Agencies shall implement the following measure during pipeline installation at stream or drainage crossings:

1. Schedule construction during the dry season and so as to avoid storm events to the extent feasible, or as required by regulatory permits (approximately June 15 to October 15);
2. Pipelines suspended from bridges shall be designed such that they do not interfere with conveyance of flows beneath the bridge, as determined by a licensed professional engineer;
3. At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.
4. If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.
5. Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and
6. Following construction, restore the construction area to pre-existing conditions.

Mitigation Measure 3.3.1b: Impervious Surface Area - WRF Improvements. Design of proposed facilities, including tertiary facilities and storage at Soscol WRF, shall be integrated into existing drainage infrastructure such that drainage patterns do not result in new erosion, siltation, or flooding. Design shall include appropriate collection and conveyance of stormwater to WWTP infrastructure, per each facility's NPDES Permit requirements for stormwater.

Mitigation Measure 3.3.1c: Siting Requirements for Storage at Jameson Ranch – Storage Alternative. To avoid alterations to existing drainage patterns in the vicinity of the storage facilities at Jameson Ranch, Napa SD shall locate the storage levees such that existing waterways remain continuously connected and any changes in existing drainage patterns caused by the levees do not result in new erosion, siltation, or flooding. Compliance with this measure can be demonstrated by:

1. Locating the levees such that no existing waterways are blocked, rerouted, or otherwise altered, as shown in the project design drawings; or
2. Hydrologic and hydraulic analyses performed in accordance with standard engineering practice document that waterways affected by the project would not result in new erosion, siltation, or flooding.

Should Napa SD elect to locate the levees such that no existing waterways are blocked, rerouted, or otherwise altered, as part of future environmental review of this programmatic project the project design shall depict the levees as part of the project.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.2: Reduction in flows within stream channels. Project operation would reduce the amount of annual discharge due to the recovery and use of recycled water that is currently discharged. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Because these individual recycling projects under the No Action Alternative would not include changes to treatment capacity at wastewater treatment facilities (and thus would not reduce the amount of water discharged to watercourses) the No Action Alternative would not alter drainage patterns as a result of discharge reduction and the impacts would be **less than significant.**

Proposed Action

With implementation of NBWRP Phase 2, the increased yield of treated recycled water would reduce the amount of water discharged by wastewater treatment facilities to nearby watercourses. Treated effluent is currently either discharged to tidally-influenced tributaries that drain to North San Pablo Bay or San Francisco Bay or it is recycled and used for irrigation. Current practices vary with each Member Agency. Typically, a portion of the treated wastewater generated is delivered to recycled water users or stored during the dry season due to seasonal discharge limitations, where discharge is restricted generally between May 1 to August 31, or to September 30 in some cases (i.e., Napa SD).

Increased recycled water production and deliveries would support ongoing compliance with seasonal discharge prohibitions as identified in the waste discharge requirements applicable to each facility. Generally, the reductions in discharge resulting from the Proposed Action would not alter channel morphology because all affected watercourses are tidally-influenced. In most cases the reductions in the amount of recycled water released by the treatment facilities due to enhanced recycled water production would not alter the existing drainage patterns such that new erosion, siltation, or flooding would result.

Some water users in the NBWRP area rely on diverting local surface water, often from smaller creeks or streams that may not be reliable sources throughout the year or in dry years. The NBWRP Phase 2 would deliver recycled water to some of these users which would offset use of local surface supplies. This surface water would stay in the small creeks and streams during the irrigation season, and could increase base flows. However, because of the timing of this offset in the dry season, base flows are not anticipated to affect stream morphology such that substantial erosion, siltation, or flooding would result. The potential for individual projects to directly alter drainage patterns as a result of changing the amount of flow in a watercourse is discussed in greater detail below for each Member Agency. NBWRP Phase 2 projects that would not result in the reduction of discharge to watercourses are not discussed further.

As noted in **Section 3.3.2.2**, California Water Code (CWC) Section 1211 assigns ownership of the treated wastewater to the owner of the wastewater treatment plant and assigns no ownership to a discharger of the raw wastewater unless in a separate agreement. Pursuant to CWC Section 1211, the owner of any wastewater treatment plant shall obtain approval from the SWRCB, Division of Water Rights, prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that decreases the flow in any portion of a watercourse. CWC 1210 further notes that where the treated wastewater has been introduced to the watercourse with the prior stated intention of maintaining or enhancing fishery, wildlife, recreational, or other instream beneficial uses, holders of existing water rights may not use or claim such water because the environmental water right would supersede those of the treatment plant owner.

Changes in discharge resulting in decreasing the flow in any portion of a watercourse are reviewed by the SWRCB pursuant to Section 1700 of the California Water Code. A petition for change must include all information reasonably available to the petitioner, or that can be obtained from the California Department of Fish and Wildlife, concerning the extent, if any, to which fish and wildlife would be affected by the change, and a statement of any measures proposed to be taken for the protection of fish and wildlife in connection with the change. A petition must also include sufficient information to demonstrate a reasonable likelihood that the proposed change will not injure any other legal user of water. As part of this process, SWRCB staff will also consider the Policy for Maintaining Instream Flows in Northern California Coastal Streams (Policy), which establishes principles and guidelines for maintaining instream flows for the protection of fishery resources, while minimizing water supply impacts on other beneficial uses of water, such as irrigation, municipal use, and domestic use. The geographic scope of the Policy encompasses coastal streams from the Mattole River to San Francisco and coastal streams entering northern San Pablo Bay, and extends to five counties: Marin, Sonoma, and portions of Napa, Mendocino, and Humboldt Counties. The Policy applies to applications to appropriate water, small domestic use, small irrigation use, and livestock stockpond registrations, and water right petitions.

The Policy does not establish specific instream flow requirements for particular rivers or streams. Nor does the Policy approve any particular water diversion projects, or specify the terms and conditions that will be incorporated into water right permits, licenses, or registrations. Instead, the Policy establishes guidelines for evaluating the potential impacts of water diversion projects on stream hydrology and biological resources. The Policy includes principles to ensure that new water appropriations and changes to existing water right permits and licenses will not affect the instream flows needed for fish spawning, migration and rearing, or the flows needed to maintain natural flow variability, which protects the various biological functions that are dependent on that variability. The Policy also contains principles to ensure that migration paths to spawning and rearing habitats are not blocked.

Because treatment facilities currently discharge directly to San Pablo or San Francisco Bay or to tidally influenced tributaries, and because discharges are already seasonally limited to winter months by NPDES permit limitations (i.e., the "wet season" typically October to April) such that summer discharges do not occur, the potential for injury to other legal users of water downstream of discharge locations would not occur, as no downstream users are present within these tidally dominated systems. Potential impacts to fisheries or wildlife are further discussion in **Section 3.6**, ***Biological Resources***. As established in **Mitigation Measure 3.3.2**, Member Agencies would complete a SWRCB petition for change of use as appropriate, therefore the impact would be l**ess than significant with mitigation.**

Novato SD. Novato SD is generally prohibited from discharging treated water to San Pablo Bay between June 1 and August 31. Once operational, the project's additional production of an average of 0.2 mgd (200 AFY) would reduce the amount of surplus water generated, if any. This reduction would not result in new erosion, siltation, or flooding offsite because the water is contained within a pipeline (and thus does not interact with erodible material) and would reduce the amount of water flowing to San Pablo Bay (thereby reducing the amount of water that could contribute to flooding). There would be no impact attributable to reduced flows.

SVCSD. The SVCSD WWTP is generally prohibited from discharging treated water between June 1 and August 31. Instead, recycled water is produced, stored and used for agricultural irrigation or discharged to wetland areas. Additional recycled water generated by this project would be similarly stored and distributed during the dry season. Because the production of recycled water would occur during the dry season, when discharge or effluent from the SVCSD WWTP generally does not occur, no change in discharge would result and the project would not affect existing flows in Schell Slough. Thus, there would be no change and **no impact** to drainage patterns that could result in erosion, siltation or flooding.

MMWD. Increased production of recycled water at the CMSA WWTP would reduce the amount of treated water released into San Francisco Bay. Because the treated water is discharged through a submerged pipeline and offshore, a reduction in discharge would have **no impact** attributable to erosion, siltation, or flooding.

Napa SD. The Soscol WRF generally does not discharge treated water to the Napa River between July 1 and September 30. Instead, water is stored in reservoirs onsite and distributed to recycled water users. Additional recycled water generated by this project would be similarly stored and distributed during the dry season (as discussed below, Napa SD also proposes to construct additional covered storage under the NBWRP Phase 2). The production of recycled water during the dry season would not affect existing flows in the Napa River. There would be **no impact** attributable to reduced flows.

Petaluma. The Ellis Creek WRF generally does not discharge treated water to the Petaluma River between May 1 and October 20. Recycled water is produced, stored, and subsequently distributed, based on demands, to recycled water users. Additional recycled water generated by this project would be similarly stored and distributed to meet demands. Because the production of recycled water would occur during the dry season, when discharged effluent from the Ellis Creek WRF is prohibited, no change in discharge would result and there would be **no impact** to existing flows in the Petaluma River.

American Canyon. The American Canyon WRF generally does not discharge treated water to North Slough between May 1 and October 31, although it releases water to constructed wetlands year-round. Recycled water is currently produced year-round at the American Canyon WRF. Additional recycled water generated by this project would reduce the discharge of treated water to the constructed wetlands year-round and to North Slough during the wet season. Discharge to North Slough during the wet season would be reduced by less than 1 cubic foot per second (presuming the release of 0.8 mgd occurs continuously) or less than 1 percent of the existing flow volume (also called the "bankfull discharge", approximated by the 2-year flood discharge volume). In addition, North Slough is tidally-influenced, which influences channel morphology. For this reason, the likelihood of the project altering the drainage patterns during the wet season is low and the impact would be **less than significant**.

Program Elements

The characteristics of the Program Elements relative to the potential reduction in annual discharge would be similar to those described under the Proposed Action. Therefore, for the reasons discussed above for the Proposed Actions, impacts of the Program Elements on drainage patterns due to discharge reductions would be **less than significant with mitigation**.

Storage Alternative

This additional supply would be generated during wet weather and stored for use during dry weather, similar to the recycled water produced under the Proposed Action. For the reasons discussed above for the Proposed Action, impacts of the Storage Alternative on drainage patterns due to discharge reductions would be **less than significant with mitigation.**

Mitigation Measures

Mitigation Measure 3.3.2: SWRCB Change of Use Petition. Member Agencies shall complete SWRCB Change of Use Petition for use of recycled water, pursuant to Section 1700 of the California Water Code. Direct diversions of less than 3 cfs or storage of less than 200 AFY may qualify for a minor petition, as appropriate. Member Agencies shall complete SWRCB Change of Use Petition process prior to recycled water distribution.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.3: Flooding and Effects to Surface Waters. The proposed Project could expose the public or structures to the risk of flooding due to placement of facilities within the one percent annual chance of exceedance flood level. The proposed action would also change the amount of discharge to local surface waters. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative, therefore **no impacts** associated with flooding would occur.

As noted below in the evaluation of the Proposed Action, the Turnout to Wetlands and first phase of American Canyon's Recycled Water Distribution System Expansion would have less than significant impacts on flooding. Impacts of Marin County Lower Novato Creek Project 1 – Distribution and Petaluma's Urban Recycled Water Expansion would be less than significant with implementation of **Mitigation Measure 3.3.1a**. The No Action Alternative would have impacts similar to those resulting from the Proposed Action: **less than significant with mitigation**.

Proposed Action

The Proposed Action would construct facilities within areas below the one percent annual chance of exceedance flood level and would in some cases alter drainage patterns (as discussed in Impact 3.3.1). In general, construction of facilities within areas below the one percent annual chance of exceedance flood level would be limited to pipeline installation across drainages, or where pipelines,

pump stations, or storage facilities are located with mapped areas below the one percent annual chance of exceedance flood level. Project components could exacerbate the flood hazards in the area if they were to increase the frequency or severity of flooding or cause flooding to occur in an area that would not be subject to flooding without the project.

Treatment upgrades within existing wastewater treatment facilities would be installed both above- and below-ground, but would be within areas where stormwater is controlled pursuant to existing NPDES permits, and generally would not be in areas mapped as below the one percent chance level of exceedance elevation. Because runoff from these facilities would be controlled, and the facilities are generally not within the floodplain, the treatment upgrades would not increase the frequency or severity of flooding or cause flooding to occur in an area that would not be subject to flooding without the project and the impacts of these facilities would be less than significant.

Pipelines would generally be installed below-ground, where once operational they would not affect runoff patterns or flooding because they would not include any topographic changes or the construction of new structures that would substantially increase the extent of flooding relative to existing conditions. Pipeline alignments would generally be restored to existing conditions and thus would not result in an increase in impervious surfaces that would restrict infiltration of floodwaters, nor would it create any topographic changes that would redirect flood flows or alter their flow rate. For these reasons impacts of below-ground pipelines, once operational, would be less than significant.

Some pipelines would be constructed across watercourses (streams, drainages, or culverts). These pipelines could be suspended from bridges or installed below-ground. Pipelines suspended along bridges could affect flooding upstream of the bridges by blocking stormwater flows during flood events. Without proper design, the pipelines could be installed within the one percent annual chance of exceedance floodplain, potentially causing flooding to occur in areas that currently are not within the one percent annual chance of exceedance floodplain. Implementation of **Mitigation Measure 3.3.1a** would reduce the significance of this effect to less-than-significant levels by requiring the suspended pipelines to be installed at elevations above the one-percent-annual chance exceedance flood level in the vicinity of the bridge. During construction, if below-ground pipelines must be installed below existing culverts within the one percent chance annual exceedance floodplain, culverts could be cut and temporarily removed, potentially causing flooding to occur in areas that currently are not within the floodplain. Implementation of **Mitigation Measure 3.3.1a**, recommending that work be scheduled during the dry season, would reduce this impact to less-than-significant levels.

New storage facilities would, in some cases, be installed within the one percent annual chance of exceedance floodplain, and could redirect or impede flood flows. Encroachment on floodplains by structures and fill can reduce flood-carrying capacity, increase flood heights and velocities, and increase flood hazards in areas beyond the encroachment itself, potentially significant impacts. This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 3.3.3**, which includes provisions for maintaining existing conveyance capacities through implementation of and adherence to existing floodplain management guidelines and requirements.

New storage facilities and other infrastructure (such as pump stations) would also be installed in areas that currently are not paved or otherwise impervious as part of the NBWRP Phase 2. Construction of new impervious surfaces or facilities could increase the quantity of stormwater runoff, potentially causing or contributing to new inundation; however, these facilities would be required to comply with local regulations designed to control the volume and rate of stormwater runoff from any developments or construction projects to minimize peak flows or total runoff volume, and to mimic the pre-development site hydrology. These controls may include limits on impervious area dimensions, quantities or locations, and/or provisions for detention and retention of runoff on-site. As discussed for individual projects below, design in compliance with these regulations would avoid flooding impacts resulting from new impervious surfaces.

In addition to direct impacts related to activities within the one percent annual chance of exceedance floodplain, the NBWRP Phase 2 would result in indirect effects related to reduced discharge from wastewater treatment facilities, use of the recycled water for irrigation, and reduced diversions from other surface water supplies. The NBWRP Phase 2 would deliver recycled water that is currently either discharged to tributaries to North San Pablo Bay or is used for irrigation. Current practices vary with each Member Agency, as discussed in Impact 3.3.2. Typically, a portion of the wastewater generated is stored during the dry season. With the NBWRP Phase 2, the agencies would recycle and deliver some of the water that they now discharge. Reduced discharges have the potential to reduce flooding; however, any beneficial effects would be minor because the facilities discharge very close to San Pablo Bay and downstream of areas that generally experience flooding. Irrigation would occur during the dry season and irrigators would be required to avoid over-application of reclaimed water in accordance with California Water Code requirements in order to avoid direct runoff and ponding. Therefore, no adverse impacts to drainage or flooding are anticipated as a result of recycled water irrigation. Some water users in the project area rely on diverting local surface water, often from smaller creeks or streams that may not be reliable sources throughout the year or in dry years. The NBWRP Phase 2 would deliver recycled water to some of these users which would offset use of local surface water supplies. This surface water would stay in the small creeks and streams during the irrigation season, and could increase base flows. However, because of the timing of this offset in the dry season, base flows are not anticipated to affect stream conditions relative to seasonal flood stages. The indirect effects of the NBWRP Phase 2 related to flooding would thus be **less than significant with mitigation.**

Table 3.3-5 summarizes the effects of each NBWRP Phase 2 projects, which are discussed in greater detail below.

TABLE 3.3-5: PROPOSED ACTION EFFECTS ON FLOODING

Proposed Action	Member Agency	Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Runoff from these facilities would be controlled, and the facilities are generally not within the 100-year floodplain; for these reasons the treatment upgrades would not increase the frequency or severity of flooding or cause new flooding and impacts would be **Less than Significant**
Soscol WRF	Napa SD	
Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	CMSA	
Pipeline Projects		
Marin County Lower Novato Creek Project 1	Marin Co.	Pipeline alignments would generally be underground, with ground surface restored to existing conditions; with implementation of **Mitigation Measure 3.3.1a** addressing pipelines suspended from bridges across watercourses, potential for redirected or impeded flood flows would be **Less than Significant**
Napa Road Pipeline	SVCSD	
San Quentin Pipeline	MMWD	
Urban Recycled Water Expansion	Petaluma	
Agricultural Recycled Water	Petaluma	
Recycled Water Distribution Expansion	American Canyon	Pipeline alignments would generally be underground, with ground surface restored to existing conditions, and would not cross watercourses; these pipelines thus would not increase the frequency or severity of flooding or cause new flooding and impacts would be **Less than Significant**
Storage or Other Projects		
Hamilton-Bel Marin Keys (BMK V) Turnout	Novato SD	Components would be underground, with ground surface restored to existing conditions, and would not cross watercourses; these components thus would not increase the frequency or severity of flooding or cause new flooding and impacts would be **Less than Significant**
Soscol WRF Covered Storage	Napa SD	The new covered storage basin would not be within the 100-year floodplain and runoff collected by the new impervious surface would be required to drain to the Soscol WRF, thus the potential for redirected or impeded flood flows would be Less than Significant
Program Elements		
Lower Novato Creek Projects 2 through 6.	Novato SD	These projects would add flood conveyance, reducing flood hazard in the vicinity and upstream, a potentially beneficial effect. Impacts would be **Less than Significant**.
Seasonal Storage	Novato SD	The new seasonal storage basin could redirect 100-year flood flows in lower Novato Creek Baylands; with implementation of **Mitigation Measure 3.3.3**, potential for redirected or impeded flood flows would be **Less than Significant**
Agricultural Recycled Water Expansion - Phase 3	Petaluma	Pipeline alignments would generally be underground, with ground surface restored to existing conditions; with implementation of **Mitigation Measure 3.3.1a** addressing pipelines suspended from bridges across watercourses, potential for redirected or impeded flood flows would be **Less than Significant**
Napa State Hospital Pipeline and Storage	Napa SD	Pipeline alignments would generally be underground, with ground surface restored to existing conditions, and would not cross watercourses; these pipelines would not increase the frequency or severity of flooding or cause new flooding and impacts. Aboveground facilities would not be within the 100-year floodplain but would install new impervious surface that could generate additional stormwater runoff; compliance with local stormwater control requirements would reduce this impact to **Less than Significant**
RW5 and RW6	American Canyon	Pipeline alignments would generally be underground, with ground surface restored to existing conditions; with implementation of **Mitigation Measure 3.3.1a** addressing pipelines suspended from bridges across watercourses, potential for redirected or impeded flood flows would be **Less than Significant**
Valley of the Moon ASR	SCWA	New facilities would not be within the 100-year floodplain but would install new impervious surface that could generate additional stormwater runoff and cause new inundation patterns; compliance with local stormwater control requirements would reduce this impact to **Less than Significant**
Sonoma ASR	SCWA	

Program Elements

As noted below in the evaluation of the Proposed Action, the Turnout to Wetlands and first phase of American Canyon's Recycled Water Distribution System Expansion would have less than significant impacts on flooding. Impacts of Marin County Lower Novato Creek Project 1 – Distribution and Petaluma's Urban Recycled Water Expansion would be less than significant with implementation of **Mitigation Measure 3.3.1a**.

Storage Alternative

Impacts of the Storage Alternative would be the same as those identified for the Proposed Action, along with the following impacts. All of the storage basins except the basin at Jameson Ranch would be located in areas inundated during the one percent annual chance of exceedance flood event, and thus could redirect flood flows. Implementation of **Mitigation Measure 3.3.3** would reduce this impact to less-than-significant levels. With implementation of **Mitigation Measure 3.3.1b**, the storage basins at Jameson Ranch would not redirect runoff such that new patterns of inundation would result. The Northern Loop and Eastern Extension pipelines would require construction of pipelines across watercourses, which could result in both temporary and long-term redirection of flood flows; implementation of **Mitigation Measure 3.3.1a** would reduce this impact to less-than-significant levels by requiring construction to occur during the dry season and requiring the suspended pipelines to be installed at elevations above the one-percent-annual chance exceedance flood level. With implementation of mitigation measures, impacts of the Storage Alternative would be similar to those identified for the Proposed Action: **less than significant with mitigation**. Impacts for each facility are identified in **Table 3.3-6**.

TABLE 3.3-6: STORAGE ALTERNATIVE EFFECTS TO FLOODING

Storage Alterative	Member Agency	Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Runoff from these facilities would be controlled, thus the treatment upgrades would not increase the frequency or severity of flooding or cause new flooding and impacts would be **Less than Significant**
Pipeline Projects		
MST Northern and Eastern Loop	Napa SD	Pipeline alignments would generally be underground, with ground surface restored to existing conditions; with implementation of **Mitigation Measure 3.3.1a** addressing pipelines suspended from bridges across watercourses, potential for redirected or impeded flood flows would be Less than Significant
Seasonal Storage		
Seasonal Storage	Novato SD	The new seasonal storage basins could redirect 100-year flood flows; with implementation of **Mitigation Measure 3.3.3**, potential for redirected or impeded flood flows would be **Less than Significant**
Seasonal Storage- Mulas	SVCSD	
Ellis Creek WRF Southeast	Petaluma	
Jameson Ranch	Napa SD	The location of these basins could redirect stormwater flows; with implementation of **Mitigation Measure 3.3.1b**, requiring that basins avoid disrupting existing drainage, the potential for redirected or impeded flood flows would be **Less than Significant**

Mitigation Measures

Mitigation Measure 3.3.3: Floodplain Hydraulic Analysis for Seasonal Storage. As part of the design process for seasonal storage, Member Agencies shall demonstrate through hydrologic and hydraulic analyses that the proposed modification and/or encroachment would not result in an increase in flood levels during the occurrence of the one percent annual chance of exceedance flood event. Analysis shall be performed by a California licensed engineer in accordance with standard engineering practices.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.4: Flooding – Sea Level Rise. Sea-level rise could affect operation of project facilities. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative, therefore **no impacts** relative to sea level rise would occur.

As this alternative would not alter the potential for inundation of these facilities under the sea level rise scenario compared with the Proposed Action, impacts would be the same as those identified for the Proposed Action described below: **less than significant with mitigation**.

Proposed Action

In recent years, the scientific community has generally reached consensus that climate change and sea level rise are likely to occur. California's position on climate change was formalized in Assembly Bill (AB 32), the California Global Warming Solutions Act of 2006. As an expression of California's position on climate change, the State initially released its *State of California Sea-Level Rise Guidance Document* in 2010, updated it in 2013, and proposes to release a second update in 2018. Locally, the San Francisco Bay Conservation and Development Commission has partnered with coastal engineers, flood managers, and technical experts as part of its Adapting to Rising Tides (ART) Program to develop locally specific, actionable sea level rise mapping and modeling products for planning purposes.

While the data relied upon for the ART Program mapping provides sea level rise projections for the San Francisco Bay at this time, scientific uncertainty remains regarding the rate and magnitude of sea level rise. Sea level rise projections beyond 2050 are highly dependent on assumptions regarding future global greenhouse gas emissions and future changes in the rate of land ice melting. In recognition of this uncertainty, the *State of California Sea-Level Rise Guidance* recommends an adaptive management approach for development in areas that may be subject to sea level rise beyond 2050. Adaptive management is an iterative process that involves monitoring conditions to evaluate whether an area could be inundated as a result of sea level rise, and identifying actions to be implemented to ensure that the area and existing structures are resilient to future flooding conditions.

The State of California released *Rising Seas in California: An Update on Sea-Level Rise Science* in 2017, which provides a synthesis of the state of the science on sea-level rise, and is the scientific foundation for the pending update to the *State of California Sea-Level Rise Guidance Document*. Included in *Rising Seas in California* are projections for sea level rise in the San Francisco Bay Area under different emissions scenarios (including a business-as-usual scenario, a stringent emissions reductions scenario, and two scenarios in between), and the probability of these scenarios. The peak level of the likely range of estimated sea-level rise at San Francisco Golden Gate under a business-as-usual scenario is approximately 3.4 feet by 2100 (Griggs et al., 2017). Projected sea-level rise by 2050 at San Francisco Golden Gate ranges to over one foot. Based on this updated sea level rise prediction, the MHHW+77 inches (i.e., mean high water plus 77 inches) of sea level rise scenario (approximating 36 inches of sea level rise and 100-year storm surge) from the ART Program maps was selected as the basis for this analysis.

Areas in Marin, Sonoma, and Napa counties that would be susceptible to impact based on elevation and proximity to San Pablo Bay include:

1. San Quentin Prison
2. Hamilton Wetlands
3. Lower Novato Creek, Highway 37, and surrounding wetlands
4. Lower Petaluma River
5. Sonoma Baylands
6. Lowland areas along the Napa River

This information is presented here in the interest of public disclosure. Water and wastewater agencies in coastal areas of California, including the Member Agencies, will need to review potential future impacts to their facilities and protect them accordingly. **Table 3.3-7** identifies Member Agency projects that could be subject to inundation under the selected sea level rise scenario. Implementation of **Mitigation Measure 3.3.4** for projects subject to inundation listed in **Table 3.3-7** would reduce the potential for the NBWRP Phase 2 to impede or redirect flood flows in flood zones under the sea level rise scenario, and the impact would be **less than significant with mitigation**.

Program Elements

As noted in **Table 3.3-7**, the Program Elements proposed by Novato SD and the City of Petaluma would encounter inundation. This information is presented here in the interest of public disclosure; these Member Agencies will need to review potential future impacts to their facilities and protect them accordingly. Implementation of **Mitigation Measure 3.3.4** for the Program Elements subject to inundation would reduce the potential for them to impede or redirect flood flows in flood zones under the sea level rise scenario. Therefore, the impact would be **less than significant with mitigation**.

Storage Alternative

As shown in **Table 3.3-8**, the Storage Alternative facilities would not result in any additional impedance or redirection of flood flows in flood zones under the sea level rise scenario beyond those identified for the Proposed Action. Impacts would therefore be the same as those identified for the Proposed Action: **less than significant with mitigation**.

TABLE 3.3-7: SUSCEPTIBILITY OF PROJECTS TO INUNDATION DURING 100-YEAR STORM WITH 36 INCHES OF SEA LEVEL RISE

Agency	Project	Currently Subject to Inundation During 100-Year Flood Event	Subject to Inundation under Sea Level Rise Scenario	Extent of Sea Level Rise Scenario Inundation
Proposed Action				
Novato SD	RWF Treatment Capacity Expansion	No	Yes	Levee within which structures installed overtopped.
	Lower Novato	Yes	Yes	
	Turnout to Wetlands	Yes	Yes	
SVCSD	Napa Road Pipeline	No	No	---
MMWD	San Quentin Prison Recycled Water Distribution System	Partial	Yes	Portions of the CMSA WWTP including the footprint of expansion components; levee within which southern quarter of pipeline installed overtopped.
Napa SD	Increase Soscol WRF Filter Capacity	Yes	Yes	Most of surrounding levees overtopped, lowland portions of the facility affected.
	Soscol WRF Covered Storage	No	Yes	
Petaluma	Increase Ellis Creek WRF Capacity	No	No	---
	Urban Recycled Water Expansion	Limited to watercourses	No	---
	Agricultural Recycled Water Expansion	Yes	Yes	Sections of Lakeville Highway overtopped between Old Lakeville Road No. 1 and Old Lakeville Road No. 2
American Canyon	Recycled Water Distribution System Expansion	No	No	---
	Recycled Water Distribution System Expansion	No	No	---
	WRF Treatment Plant Upgrades	No	No	---
Program Elements				
Novato SD	Seasonal Storage Near Highway 37	Yes	Yes	Highway 37 overtopped, all lowland areas north of Highway 37 inundated
	Marin County Lower Novato Creek Project - Restoration	Yes	Yes	All areas inundated
City of Petaluma	Agricultural Recycled Water Expansion Phase 3	Yes	Yes	Sections of Lakeville Highway overtopped between Old Lakeville Road No. 1 and Old Lakeville Road No. 2
Napa SD	Napa State Hospital Storage Tank	No	No	---
Sonoma County Water Agency	Valley of the Moon and Sonoma ASR	No	No	---
American Canyon	RW5 (Jim Oswald Way/ Mezzetta Court Pipeline)	No	No	---
	RW6 (Hanna Drive Pipeline)	No	No	---

SOURCES: Federal Emergency Management Agency, National Flood Hazard Layer, October 2017.
San Francisco Bay Conservation and Development Commission, January 2017. Bay Area Sea Level Rise Analysis and Mapping Project results for Marin, Napa, and Sonoma counties under Mean Higher High Water (MHHW) plus 77 inches scenario, corresponding to 36 inches of sea level rise plus 100-year storm surge.

TABLE 3.3-8: SUSCEPTIBILITY OF STORAGE ALTERNATIVE TO INUNDATION DURING 100-YEAR STORM WITH 36 INCHES OF SEA LEVEL RISE

Agency	Project	Currently Subject to Inundation During 100-Year Flood Event	Subject to Inundation under Sea Level Rise Scenario	Extent of Sea Level Rise Scenario Inundation
Storage Alternative				
Novato SD	RWF Capacity Expansion	No	Yes	Highway 37 overtopped, all lowland areas north of Highway 37 inundated
	Seasonal Storage	Yes	Yes	
Napa SD	MST Northern and Eastern Loop	Limited to watercourses	No	-
	Jameson Ranch	No	No	-
SVCSD	Seasonal Storage - Mulas	No	No	-
Petaluma	Ellis Creek WRF Southeast	Yes	Yes	Sections of Lakeville Highway overtopped

Mitigation Measures

Mitigation Measure 3.3.4: Design Measures Addressing Sea Level Rise. Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.

Impact Significance after Mitigation: Less than Significant.

Impact 3.3.5: Flooding – Other Hazards. The NBWRP Phase 2 would not cause or exacerbate any existing risk of inundation by seiche, tsunami, or mudflow. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative, therefore **no impacts** attributable to seiche, tsunami, or mudflow would occur.

As this alternative would not alter the potential for seiche, tsunami, or mudflow (by installing structures that would influence flow of a seiche or tsunami, or that would release additional recycled water) compared with the Proposed Action, impacts would be the same as those identified for the Proposed Action: **less than significant with mitigation**.

Proposed Action

As discussed in greater detail in Impact 3.2.3 of **Section 3.2**, ***Geology***, the NBWRP Phase 2 area is characterized by relatively flat topography with no steep grades or abrupt changes in elevation. Given this flat topography, mudflows during construction would be unlikely. Implementation of BMPs pursuant to **Mitigation Measure 3.5.1** would further avoid exacerbating risk of mudflow. Once operational, the new recycled water deliveries could exacerbate mudflow conditions if the recycled water is used to irrigate soils that are already saturated in areas with steepened slopes. This situation is unlikely, however, due to the seasonality of recycled water irrigation (generally occurring only during the dry season, when soils are not saturated) and to the requirements that apply to the use of recycled water pursuant to Title 22 the California Water Code (requiring irrigators to avoid both saturation of irrigated soils and generation of incidental runoff)

As discussed above in **Section 3.3.1**, the MMWD Recycled Water Distribution pipeline is within a potential tsunami inundation zone as mapped by the State of California. The distribution pipeline would be installed below ground in the roadway. The National Oceanic and Atmospheric Administration (NOAA) operates the Pacific Tsunami Warning System with centers located in Hawaii and Alaska. These warning centers are linked to the Advanced National Seismic System that monitors earthquakes in the United States, to the international seismic monitoring systems, and to a system of tide gauges and buoys. The California Integrated Seismic Network also provides information regarding the magnitude and location of California earthquakes and a quick link to the NOAA/West Coast and Alaska Tsunami Warning Center. Based on the level of threat indicated by these systems, NOAA issues a Tsunami Advisory, Watch, or Warning. The Tsunami Warning System takes an average of 7 to 10 minutes to identify a tsunami threat and communicate it to the media and state warning systems. The initial notification is based on seismic data. A tsunami's travel time is on the order of minutes (for local events) to hours (for distant events). During this time, the initial notification is normally updated once additional information is available, at least every 30 minutes. The status of an advisory,

watch, or warning can be upgraded or downgraded or the impact area expanded based on the new information. While workers would occupy the area during their work shifts, in the event that the National Warning System issues a tsunami warning, this system would allow adequate time for evacuation of the area should workers be present when the warning is issued.

For these reasons, the project would not create or exacerbate any existing risk of inundation by mudflow, tsunami, or seiche, and the impact would be **less than significant with mitigation**.

Storage Alternative

The additional facilities constructed under the Storage Alternative would not be located such that they could affect the flow of a seiche or tsunami beyond what has already been identified for the Proposed Action. The Storage Alternative would supply additional recycled water compared to the Proposed Action. Additional facilities installed under this alternative would be located in lowland areas, similar to the Proposed Action; for similar reasons, mudflows caused by construction activities would thus be unlikely. Use of the additional recycled water for irrigation would be subject to the same legal and regulatory requirements as the Proposed Action, limiting the effect of the Storage Alternative on mudflow conditions. Impacts of the Storage Alternative would thus be similar to impacts of the Proposed Action: **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.3.1a: Stream and Drainage Crossings (refer to Impact 3.3.1)

Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit (in **Section 3.5, *Water Quality***)

Impact Significance after Mitigation: Less than Significant.

3.3.3.3 Impact Summary by Service Area

Appendix 3.3B provides a summary of potential Project impacts per Member Agency related to surface hydrology.

3.4 Groundwater Resources

This section describes existing groundwater resources in the project area in Section 3.4.1, *Affected Environment.* Section 3.4.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRA Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. All figures referred to in this section are available in Appendix A. The Local Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.4A. The Impact Summary table is included in Appendix 3.24B. During scoping for this EIR/EIS, no comments were received specific to groundwater issues.

3.4.1 Affected Environment

Groundwater is the main supply for the majority of agricultural and rural residential users in the project area. In addition, several entities, including, the City of Sonoma, City of Petaluma, and Valley of the Moon Water District (VOMWD), rely on groundwater to supplement surface water supplies. Groundwater use is limited in the Marin Municipal Water District (MMWD) and North Marin Water District (NMWD) service areas due to a lack of substantial underlying groundwater aquifers and poor groundwater quality. Neither MMWD nor NMWD use groundwater for community drinking water supplies within the project area. However, private domestic wells exist within Marin County. Neither the City of Napa nor the City of American Canyon use groundwater for drinking water supplies; however, unincorporated areas of Napa County (including the Milliken-Sarco-Tulucay Creeks [MST] basin area) rely almost solely on groundwater for domestic uses.

3.4.1.1 Regional Conditions

The principal groundwater-bearing aquifers in the project area are comprised of alluvial deposits and sedimentary formations that cover most of the Sonoma, Napa, and Petaluma Valleys. The aquifer systems in these valleys include both unconfined and confined aquifers separated in places by zones of clay rich sediments and generally flow toward San Pablo Bay. In localized areas adjacent to the Bay, local flow direction has been reversed, likely due to an increase in groundwater pumping (Farrar and Metzger, 2003; Farrar et al., 2006). Groundwater levels in the alluvial deposits vary by region, but are generally between 5 and 75 feet below the ground surface (CDM, 2008). In the valley areas and lowlands bordering San Pablo Bay, groundwater is often considered shallow, and can often be found less than 15 feet below the ground surface (bgs). Municipal and irrigation wells in these basins have average depths ranging from about 200 to 500 feet (DWR, 2003).

Groundwater quality in most of the project area is generally considered adequate for domestic and irrigation uses; however, localized areas experience poor groundwater quality. Increased groundwater pumping, low rainfall, saline intrusion from San Pablo Bay, low soil permeability, and geothermal upwelling are believed to contribute to declining groundwater levels and poor groundwater quality in portions of the project area. The groundwater aquifer in parts of Sonoma and Napa counties has high concentrations of arsenic, boron, iron, total dissolved solids, manganese and chloride concentrations (DWR, 2003 and Luhdorff & Scalmanini, 2016). Groundwater quality varies considerably in the Petaluma Valley; high levels of nitrate contamination are known to occur in shallow wells northwest of Petaluma, and south of Petaluma groundwater is generally of poor quality (DWR, 2014). Saline intrusion continues to be an issue in areas bordering San Pablo Bay. However, in general recent (2009-2015) groundwater quality in the Napa Valley Subbasin of the Napa-Sonoma Subbasin has been stable compared to previous data reported through 2008 (Luhdorff & Scalmanini, 2016).

Groundwater pumping in Sonoma and Napa counties has increased in the past 20 years because of population growth and an increase in agriculture. Several pumping depressions are now evident within Sonoma and Napa counties, and groundwater levels have generally declined in these areas (Farrar et al., 2006; Farrar and Metzger, 2003). Some wells with long historical measurement records illustrate the stability of these water level trends extends over several decades. While the majority of wells exhibit stable trends, periods of year-to-year declines in groundwater levels have been observed in a few wells near the Napa Valley margin in the northeastern Napa Subarea and southeastern St. Helena Subarea.

3.4.1.2 Local Conditions

Several groundwater basins are located within the NBRWP Phase 2 project area. **Figure 3.4-1 (**in **Appendix A)** shows these basins. Local groundwater conditions in each service area are discussed in **Appendix 3.4A**. Descriptions of the groundwater basins have been obtained from the following sources:

1. DWR's Bulletin 118 Update 2003 (DWR, 2003).
2. *Geohydrologic Characterization, Water Chemistry, and Ground Water Flow Simulation Model of the Sonoma Valley Area, Sonoma County, California.* U.S. Geological Survey (USGS) Scientific Investigations Report 2006-5092 (Farrar et al., 2006).
3. *Ground-Water Resources in the Lower Milliken–Sarco–Tulucay Creeks Area, Southeastern Napa County, California, 2000–2002.* USGS Water-Resources Investigations Report 03-4229 (Farrar and Metzger, 2003).
4. *Sonoma Valley Final Groundwater Management Plan* (Sonoma County Water Agency [SCWA], 2007).

5. *Sonoma Valley Groundwater Management Program 2015 Annual Report* (SVGMP, 2016)
6. *Napa County Baseline Data Report* (County of Napa, 2005).
7. *Napa Valley Groundwater Sustainability, A Basin Analysis Report for the Napa Valley Subbasin,* (Luhdorff & Scalmanini, 2016)
8. *City of American Canyon 2015 Urban Water Management Plan, May 2016* (Kennedy Jenks, 2016)

3.4.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Groundwater issues and used to determine the significance criteria presented in Section 3.4.3.1 is found in **Appendix 3.4A**.

3.4.3 Direct and Indirect Effects

The following section contains impact analysis for the Proposed Action, No Project/No Action, and Storage Alternative. The Storage Alternative includes facilities identified under the Proposed Action and can be found in Section 3.2.3.2 in the Project Description.

3.4.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, the NBWRP Phase 2 Project or an alternative would result in a significant impact on groundwater resources if it would:

1. Substantially degrade groundwater quality;
2. Result in an increase in the potential for flooding; or
3. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

3.4.3.2 Direct and Indirect Effects

This section analyzes the potential environmental consequences of the NBWRP Phase 2 and alternatives on groundwater resources. With the exception of the MST area, this analysis assumes that water use (in areas that currently use groundwater) would not change as a result of implementation of the project or alternative. Provision of recycled water would be used to offset groundwater use; it would not contribute to an increase in water use.

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives. Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is likely that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Reclamation Facility, and 600 AF tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Because specific recycled water users were not identified at the time of this document, the analysis assumes all irrigated lands currently rely on groundwater and therefore the use of recycled water would result in a corresponding offset in the existing use of groundwater supplies. In reality, there may be areas of irrigated lands that rely on surface water or other municipal sources. In these instances, the offset provided would not be solely applicable to existing groundwater use, but would in fact provide a corresponding offset to whatever combination of irrigation supplies are currently in use at an existing user site.

Impact 3.4.1: Groundwater Quality. The use and storage of recycled water could affect groundwater quality for potable and agricultural uses. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, no expansion of recycled water would occur. However, it is likely that implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

All storage facilities would be designed to prevent leakages. The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible. In addition, storage facilities would adhere to Title 22 requirements and would be located 100 feet away from any domestic groundwater wells to reduce the potential risk of adverse water quality effects.

The majority of the recycled water under this alternative would be used for vineyard irrigation, followed by urban landscaping. These uses are not expected to result in a large quantity of recycled water that could percolate into the soils or impact groundwater quality. As required by Title 22, no recycled water would be used within 50 feet of any domestic groundwater well. Overall, groundwater quality impacts from the use and storage of recycled water are expected to be **less than significant**.

Proposed Action

Use of recycled water under the NBWRP Phase 2 could adversely affect groundwater quality in the vicinity of domestic groundwater wells if not managed appropriately. If recycled water is of lower water quality than ambient groundwater water quality could become compromised resulting in lower water quality and potential health risks. However, recycled water associated with the NBWRA Phase 2 that does infiltrate into the groundwater would not be expected to pose a health risk due (1) to widely used practices of irrigation with recycled water at agronomic rates and (2) compliance with California Code of Regulations Title 22 water quality standards.

Irrigation Practices. Use of recycled water in these areas is not expected to pose a water quality risk to existing groundwater due to application practices. Much of the recycled water would be used to irrigate existing vineyards in the Napa, Sonoma, and Petaluma Valleys. Agricultural growers in these areas mainly use drip irrigation systems, which have an 80 to 95 percent use efficiency[1] when applied correctly resulting in very minimal infiltration beyond the root zone to underlying aquifers (Vickers 2001). Additionally, some premium wine producers practice a Reduced Demand Irrigation (RDI), a technique that decreases irrigation at certain times of the season to increase the quality of the fruit (CDM, 2008). Due to the efficiency of vineyard irrigation systems, it is unlikely that a substantial amount of recycled water would be able to percolate through the soils and into the groundwater aquifer. In addition, recycled water that does percolate into the ground below the root zones would generally improve in quality as it reaches the groundwater aquifer because the soils act as natural filters.

Title 22 Compliance. The use of recycled water for agricultural irrigation or urban landscape irrigation under the NBWRP Phase 2 is not expected to contribute to adverse water quality impacts associated with existing groundwater wells due to compliance with Title 22. Title 22 provides specific requirements for the use of recycled water depending on the end uses of the water and includes minimum separation distances from domestic groundwater supply wells. All users of disinfected tertiary recycled water would be required to adhere to the following Title 22 minimum distance requirements for recycled water use in the vicinity of domestic groundwater wells:

1. 50 feet for disinfected tertiary recycled water unless additional conditions are met; and
2. 100 feet for impoundments of disinfected tertiary recycled water (Title 22).

In addition, the general reduction in use of local groundwater supplies from any increase in recycled water use for irrigation would potentially have beneficial impacts to groundwater quality. The concentration of salts in groundwater, typically measured by the amount of total dissolved solids, can increase through what is known as evaporative enrichment. Evaporation rates are highest during the summer months when irrigation water is typically applied. As the water molecules evaporate, the salts remain behind to percolate into the underlying groundwater. When this water is later pumped for additional irrigation, the evaporation cycle is repeated and salinity levels continue to increase over time.

The NBWRP Phase 2 would also include storage of recycled water in existing and constructed storage facilities. The storage of recycled water is not expected to cause adverse water quality effects in groundwater associated with seepage. New storage facilities would be designed with compacted tight soils and a membrane liner at the bottom to prevent any leakage. Existing storage facilities have very low seepage rates, if any, due to the predominantly clay soils in the region, especially in the flat areas where storage ponds are typically constructed. The amount of the groundwater actually infiltrating to subsurface levels and thus affecting the groundwater

[1] Efficiency refers to the amount of water that would be taken up by the plant rather than lost through percolation into the ground or surface water run-off.

quality would be negligible (SVCSD, 2006). Additionally, the storage facilities would be located at least 100 feet from any domestic groundwater well. Therefore, impacts would be **less than significant**.

Program Elements

Impacts associated with the Program Elements would be equivalent to those identified for the Propose Action. The irrigation practices described under the Proposed Action would be applicable by the Program Elements. These uses are not expected to result in a large quantity of recycled water that could percolate into the soils or impact groundwater quality. As required by Title 22, no recycled water would be used within 50 feet of any domestic groundwater well.

All above ground storage facilities (i.e., reservoirs, tanks) would be designed to prevent leakages. The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible. In addition, storage facilities would adhere to Title 22 requirements and would be located 100 feet away from any domestic groundwater wells to reduce the potential risk of adverse water quality effects. Therefore, groundwater quality impacts from the use and storage of recycled water are expected to be **less than significant**.

Storage Alternative

All storage facilities would be designed to prevent leakages. The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible. In addition, storage facilities would adhere to Title 22 requirements and would be located 100 feet away from any domestic groundwater wells to reduce the potential risk of adverse water quality effects. Therefore, potential impacts would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.4.2: High Groundwater Conditions. The NBWRP Phase 2 could result in localized increases in groundwater levels over the long term that could affect structures or contribute to flooding. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Storage Alternative.

Under the No Action Alternative, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Therefore, a subset of the impacts identified for the NBWRP Phase 2 would likely occur irrespective of the projects within the NBWRP Phase 2.

For a comparison baseline to the Action Alternatives, it is estimated that these individual recycled water projects would in total provide approximately 4,885 AFY of recycled water across the entire study area, providing a potential corresponding offset in groundwater pumpage. The range in project yield between projects would vary from 25 AFY (American Canyon Recycled Water Distribution System Expansion – Phase 2) to a maximum of 840 AFY (Novato SD Turnout to Wetlands). As noted above, the MST basin has an estimated total storage of 200,000 AF. Overall, compared to quantities of groundwater in storage, the quantity of recycled water to be distributed is not expected to be enough to raise groundwater levels to the extent that they could cause localized flooding. Therefore, potential impacts would be **less than significant**.

Proposed Action

Overall, implementation of the NBWRP Phase 2 would potentially maintain or even increase groundwater levels over the long term because additional recycled water would become available to end users and be used to offset current groundwater pumping. By design and in accordance with the program objectives, the majority of the recycled water would offset groundwater use with the goal of stemming overdraft conditions in areas with declining groundwater levels. The quantity of recycled water used to offset groundwater, a total of approximately 4,885 AFY, is expected to assist in preventing a continuation of the declining trend but is not expected to be substantial enough to entirely reverse the trend such that it would create the potential for high groundwater conditions that could affect structures or contribute to flooding. The MST basin alone has an estimated total storage of 200,000 AF. Therefore, this impact is considered **less than significant**.

Program Elements

Impacts associated with the Program Elements would be equivalent to those identified for the Propose Action. The annual yield of these elements, taken individually, would range from 18 AFY to 860 AFY. Overall, compared to quantities of groundwater in

storage, the quantity of recycled water that would be distributed is not expected to be enough to affect groundwater levels to the extent that localized flooding could occur. Therefore, this impact is considered **less than significant**.

Storage Alternative

The amount of recycled water in storage facilities that could infiltrate to subsurface levels would be considered negligible, and would not affect groundwater levels to the extent that they could cause localized flooding. Therefore, potential impacts would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.4.3: Hydrostatic Pressure. Proposed facilities may be affected by shallow groundwater levels and natural groundwater fluctuations. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, standard design features and engineering practices that are common to water supply infrastructure would be implemented to reduce the potential for damage due to fluctuating groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios. **Mitigation Measure 3.4.3** includes incorporation of such design features, and therefore, the impacts of shallow groundwater on the proposed facilities would be **less than significant with mitigation**.

Proposed Action

The study area covers a wide geographic expanse with a range of hydrogeologic characteristics and groundwater levels. There are regions in the project area that could have shallow (less than 15 feet below the ground surface) or even localized perched groundwater. Many of the proposed facilities, including pipelines, pump stations, and storage facilities, would be constructed several feet below the ground surface and therefore could be subject to hydrostatic pressure relating to groundwater. If not designed appropriately, hydrostatic pressure can cause damage to improvements over time.

Standard design features and engineering practices that are common to water supply infrastructure would be implemented to reduce the potential for damage due to fluctuating groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

Implementation of **Mitigation Measure 3.4.3**, which includes incorporation of such design features, the impacts of shallow groundwater on the proposed storage facilities would be reduced to a **less-than-significant** level.

Program Elements

Impacts associated with the Program Elements would be equivalent to those identified for the Propose Action. Standard design features and engineering practices that are common to water supply infrastructure would be implemented as appropriate to each of the remaining Program Elements to reduce the potential for damage due to fluctuating groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios. **Mitigation Measure 3.4.3** includes incorporation of such design features; therefore, the impacts of shallow groundwater on the Program Elements would be **less than significant with mitigation**.

Storage Alternative

The potential for impacts related to fluctuating groundwater would be proportional to the additional facilities proposed under the Storage Alternative. Standard design features and engineering practices that are common to water supply infrastructure would be implemented to reduce the potential for damage due to fluctuating groundwater levels. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios. Implementation of **Mitigation Measure 3.4.3**, which includes incorporation of such design features, the impacts of shallow groundwater on the proposed facilities would be **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.4.3 The Member Agencies shall implement the following measures:

a. All proposed improvements shall be designed and constructed in accordance with current geotechnical industry standard criteria as overseen and approved by a state licensed geotechnical engineer.

b. Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices and current building code requirements. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

Impact Significance: Less than Significant.

Impact 3.4.4: Groundwater Recharge. Impervious surfaces constructed under the NBWRP Phase 2 could affect groundwater recharge in the project area. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative, therefore **no impact** would occur.

Under the No Action Alternative, proposed projects would not substantially increase the amount of impervious surface areas at existing water reclamation or recycling facilities or along proposed pipeline routes. Potential impacts would be proportionally reduced compared to the Proposed Action, due to the reduction in facilities. Therefore, potential impacts would be **less than significant**.

Proposed Action

The addition of new impervious surfaces in areas that were previously pervious can reduce the amount of precipitation that would infiltrate onsite. When impervious surfaces are constructed, precipitation that falls on the surfaces generally is collected and discharged directly to nearby waterways offsite. The increase in impervious surfaces can therefore reduce the potential for percolation and groundwater recharge. The NBWRP Phase 2 would include the construction of new pipelines, improvements to existing WWTPs, and the construction of new storage tanks or ponds. The pipelines would not change the impervious surfaces in any watershed because, by design, the pipelines would be covered with the same type of surface after construction as was present before construction. Most improvements at existing WWTPs would be within areas that are already impervious, so would not affect groundwater recharge. The remaining improvements including storage tanks or ponds would not represent a large enough area relative to the underlying aquifers to substantively alter groundwater levels from any reduction in recharge. In addition, most facilities are required to adhere to local drainage control requirements that include drainage features that promote onsite infiltration. Therefore, potential impacts would be **less than significant**.

Program Elements

Impacts associated with the Program Elements would be equivalent to those identified for the Propose Action. The Program Elements would include the construction of new pipelines, installation of wells, and the construction of new storage tanks or ponds. The pipelines would not change the impervious surfaces in any watershed because, by design, the pipelines would be covered with the same type of surface after construction as was present before construction. The ASR wells would either be installed in areas of existing impervious surface and/or take up an insignificant area of ground surface. The storage tanks or ponds would not represent a large enough area relative to the underlying aquifers to substantively alter groundwater levels from any reduction in recharge. In addition, most facilities are required to adhere to local drainage control requirements that include drainage features that promote onsite infiltration. Therefore, potential impacts attributable to the Program Elements would be **less than significant**.

Storage Alternative

As noted above in the evaluation of the Proposed Action, proposed projects would not substantially increase the amount of impervious surface areas at existing water reclamation or recycling facilities or along proposed pipeline routes. Potential impacts would be proportionally increased compared to the Proposed Action, due to the increase in facilities. Therefore, potential impacts would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.4.3.3 Impact Summary by Service Area

Appendix 3.4B provides a summary of potential Project impacts per Member Agency related to groundwater resources.

3.5 Water Quality

This section describes regional water quality conditions in the project area in Section 3.5.1, *Affected Environment*. Section 3.5.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and all alternatives (including potential public health impacts related to recycled water use), and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. The Regulatory Framework that governs these resources is presented in Appendix 3.5A and the Impact Summary table is included in Appendix 3.5B. Refer to Section 3.3, *Surface Hydrology*, for analysis related to drainage, and flooding, and Section 3.4, *Groundwater Resources*, for analysis related to groundwater. During scoping for this EIR/EIS, water quality-related concerns raised by the public and responsible agencies included a letter from the State Water Resources Control Board (SWRCB) identifying SWRCB requirements for recycled water use.

3.5.1 Affected Environment

3.5.1.1 Regional Conditions

Creek and river flows in the project area are generated primarily by stormwater runoff within each watershed. The mix of urban, rural, agricultural, and undeveloped land uses within the project area contributes to varied pollutant types and concentrations that currently exist in each creek and river. Urban pollutants can include sediment, oil and grease, heavy metals, pesticides, and debris. Agricultural pollutants can include contaminants from livestock manure and chemical fertilizers. Rural residential land uses can potentially contribute pollutants through malfunctioning onsite sewage disposal systems in areas without access to municipal wastewater treatment systems. **Table 3.5-1** presents the waterways in the project area that have been identified by either the U.S. Environmental Protection Agency (USEPA) or the San Francisco Bay Regional Water Quality Control Board (RWQCB) as not meeting the water quality standards necessary for each water bodies' stated beneficial use under Section 303(d) of the Clean Water Act (CWA).

TABLE 3.5-1: SECTION 303(D) WATER QUALITY IMPAIRED WATERWAYS

Location/ County	Water Body	Pollutant	Source
Project Area	San Pablo Bay	Chlordane	Source Unknown
		DDT	Source Unknown
		Dieldrin	Source Unknown
		Dioxin Compounds	Source Unknown
		Invasive Species	Source Unknown
		Furan Compounds	Source Unknown
		Mercury	Source Unknown
		PCBs	Source Unknown
		PCBs (dioxin-like)	Source Unknown
		Selenium	Source Unknown
Marin	San Antonio Creek	Diazinon	Urban Runoff/ Sewers
	Miller Creek	Diazinon	Source Unknown
	Novato Creek	Diazinon	Source Unknown
Sonoma	Petaluma River	Diazinon	Source Unknown
		Trash	Source Unknown
		Nutrients	Source Unknown
		Pathogens	Source Unknown
		Sedimentation /Siltation	Source Unknown
	Sonoma Creek (Tidal and Non-Tidal)	Nutrients	Agriculture, Onsite Wastewater Systems/Septic Tanks (tidal only)
		Pathogens	Agriculture (non-tidal) and Onsite Wastewater Systems/Septic Tanks (Tidal)
		Sedimentation /Siltation (non-tidal only)	Source Unknown
Napa	Napa River (Tidal and Non-Tidal)	Nutrients	Agriculture; Onsite Wastewater Systems/Septic Tanks
		Pathogens	Onsite Wastewater Systems/Septic Tanks
		Sedimentation /Siltation	Agriculture; Road Construction

SOURCE: RWQCB, 2017

Recycled Water Use

The Member Agencies of the North Bay Water Reuse Authority have all developed recycled water use programs that distribute recycled water for irrigation of local vineyards, dairies, hay growers, golf courses, and parks. During the dry season, the agencies send recycled water that is in excess of their recycled water deliveries to holding ponds, wetlands, or rely upon the spreading and evapotranspiration of recycled water on local grassland. The Member Agencies do not produce recycled water for drinking or recreational purposes. The previously approved Phase 1 program expanded the distribution of recycled water across the participating agencies within the North Bay Water Reuse Authority.

Recycled Water Quality

Recycled water is used for numerous agricultural applications throughout California and the United States. In accordance with California Code of Regulations (CCR) Title 22, there are specific filtration and disinfection requirements that recycled water must meet depending on the end use. Additional parameters may be desirable to meet based on the end user's water quality objectives, such as a plant or crop's tolerance to certain constituents sometimes found in recycled water. The chemical constituents to consider for agricultural irrigation are salinity, sodium, trace elements, excessive chlorine residual, and nutrients. Recycled water may have higher concentrations of these constituents than the groundwater or surface water sources from which the water supply is originally drawn. However, the recycled water can also have lower concentrations of these constituents than the local supply currently used for irrigation.

The types and concentrations of constituents in recycled water depend upon the municipal water supply, the influent waste streams (i.e., domestic, commercial, and industrial contributions), amount and composition of infiltration in the wastewater collection system, the wastewater treatment process, and type of storage facilities. A description of the constituents that should be considered when addressing agricultural or landscaping irrigation is provided below.

1. **Salinity:** Salinity is an important parameter in determining the suitability of the water to be used for irrigation. High levels of salinity can reduce growth and production of grapevines and other plants. As the salt concentration of the water in the root zone increases above a threshold level the plant must expend more energy to absorb water, and both the growth rate and ultimate size of the crop progressively decrease. However, the threshold and the rate of growth reduction vary widely among different crop species. In addition, the amount of infiltrated water that drains below the root zone affects the whether the salinity in the recycled water causes a potential impact (USEPA 2012 as cited in Brown and Caldwell, 2017 and University of California Agriculture and Natural Resources, 2006).
2. **Sodium:** Excessive sodium in irrigation water could contribute to soil dispersion and structural breakdown, where the finer soil particles fill many of the smaller pore spaces, sealing the surface and greatly reducing water infiltration rates (USEPA 2012 as cited in Brown and Caldwell, 2017).
3. **Trace elements:** Nickel and zinc have visible adverse effects in plants at lower concentrations than the levels harmful to animals and humans. Although boron is an essential element required for plant growth, it is nonetheless potentially harmful in the soil should the concentrations become too high. Grapes are particularly sensitive to boron in irrigation water and can develop injury to leaves and shoots if concentrations exceed certain limits (USEPA 2012 as cited in Brown and Caldwell, 2017).
4. **Chlorine Residual:** Free chlorine residual at concentrations of less than 1 milligram per liter (mg/L) usually poses no problem to plants. However, some sensitive crops may be damaged at levels as low as 0.05 mg/L. Some woody crops may accumulate chlorine in the tissue to toxic levels. Excessive chlorine has a similar leaf-burning effect as sodium and chloride when sprayed directly on foliage (USEPA 2012 as cited in Brown and Caldwell, 2017).
5. **Nutrients:** The nutrients most important to a crop's needs are nitrogen, phosphorus, potassium, zinc, boron, and sulfur. Recycled water usually contains enough of these nutrients to supply a large portion of a crop's needs. The most beneficial nutrient is nitrogen. Both the concentration and form of nitrogen need to be considered in irrigation water. While excessive amounts of nitrogen stimulate vegetative growth in most crops, it may also delay maturity and reduce crop quality and quantity. The nitrogen in recycled water may not be present in concentrations great enough to produce satisfactory crop yields, and some supplemental fertilizer may be necessary. In addition, excessive nitrate in forages can cause an imbalance of nitrogen, potassium, and magnesium in grazing animals. This could be an issue if the forage is used as a primary feed source for livestock; however, such high concentrations are usually not expected with municipal recycled water (USEPA 2012 as cited in Brown and Caldwell, 2017).
6. **Microconstituents:** Microconstituents is a term currently used to describe a variety of natural and manmade substances, including pharmaceuticals, household cleaning products, personal care products, plastics, packaging, and other products of a developed society. Microconstituents have been observed in surface and groundwater sources, municipal drinking water supplies and in treated wastewater streams. The degree to which the presence of these compounds in treated wastewater is contributing to their accumulation in surface water and groundwater resources is unknown. The human toxicological significance of microconstituents in drinking water or in recycled water for landscaping use is an ongoing area of research, and regulatory agencies have not yet developed standards due to insufficient availability of data to evaluate potential effects of exposure to humans. Potential health effects for humans from exposure to microconstituents at concentrations detected in

reclaimed water is not scientifically known but is suspected to range from an extremely low risk to unassignable risk. The availability of research data on the potential uptake of microconstituents by crops irrigated with recycled water is also insufficient to support conclusive determination of the significance of any potential affect generated at this time.

The University of California (UC) Division of Agriculture and Natural Resources at UC Davis completed a study in 2006 which examined the quality of Napa SD's recycled water and its appropriateness for vineyard applications. The study was followed up in 2014 after reviewing data from 8 years of applying recycled water for irrigation on a vineyard (UCANR, 2014). The study concluded that Napa SD recycled water is satisfactory for vineyards on a long term basis with respect to salinity, chloride, sodium, boron, calcium to magnesium ratio, 24 trace elements (mostly metals), nitrogen, phosphorus, and potassium. The study also concluded that long-term salinity accumulation is not expected to occur when using Napa SD recycled water. In fact, nitrogen levels in recycled water can be beneficial for vineyards and other crops unless nitrogen levels are already high. For vineyards that do not currently fertilize with nitrogen additives, the use of appropriate cover crops and additional irrigation sources can offset the low amount of nitrogen present in recycled water. The study also stated that recycled water use is consistent with the National Organic Program standards for certified organic vineyards (UC Division of Agriculture and Natural Resources, 2006).

Summaries of water quality data for each of the participating wastewater treatment plants' (WWTP) effluent taken from most recently available data are presented in this section and summarized in **Table 3.5-2**. The descriptions also present the water quality guidelines for the use of recycled water by the USEPA, the 2006 study by the UC Division of Agriculture and the North Bay Watershed Association (NBWA).

As is presented in this section, in almost all cases the effluent of the participating WWTPs meets the recommended water quality guidelines in the California Code of Regulations (CCR) Title 22. The constituents that are present at levels higher than those identified in the NBWA study are chlorine residual, sodium, and specific conductance (as measured at Napa SD for chlorine residual, and SVCSD and Napa SD for sodium and specific conductance); however, these constituents have no recommended maximum level by USEPA or the UC Division of Agriculture. It is likely that as the tertiary treatment capacity is increased, the constituent levels in the effluent would also be reduced due to the improved filtration requirements of CCR Title 22 tertiary treated recycled water.

3.5.1.2 Novato SD

During the discharge season (September 1 through May 31), Novato SD's treated wastewater is either recycled, or discharged directly to San Pablo Bay via an outfall. During the non-discharge period, treated wastewater is conveyed to three District-owned irrigation parcels (totaling approximately 820 acres), two treated water storage ponds, and 15 acres of wildlife habitat. These parcels are on Route 37, approximately 1 mile northeast of the Ignacio pump station. In 2008, NMWD constructed and began operating a 0.5 mgd (1.5 AF per day) facility, the Deer Island Recycled Water Facility on Novato SD's leased fields, east of the Novato RWF that is able to provide treatment to Title 22 tertiary levels. The facility is operational and is expandable to 1.0 mgd. It is located near the Novato SD RWF's discharge pipeline in the current irrigation fields and is designed to supply approximately 269 AF per year (AFY) of recycled water to the local Stone Tree Golf Course and other users (SCWA & Reclamation, 2008). In addition, in 2012 as part of NBWRP Phase 1, the Novato SD constructed and began operating a 0.85 MGD (firm), 1.7 MGD (nominal) capacity Recycled Water Facility (RWF) on the site of its wastewater treatment facility. The Novato SD secondary facility is permitted to treat up to a capacity of 7.0 mgd. Wastewater inflow in 2014 was 6,245 AFY with a projection of 8,811 AFY by 2025. **Table 3.5-2** presents the WWTP effluent quality data from 2015 provided by Novato SD, and the corresponding USEPA, NBWA and University of California Division of Agriculture and Natural Resources guidelines for the use of recycled water.

3.5.1.3 SVCSD

Currently, the treated wastewater from the SVCSD wastewater treatment facility is discharged into Schell and Hudeman Slough (waters of the United States) from November 1 through April 30. Between May 1 and October 31, treated wastewater is either stored in SVCSD's reservoirs R1, R2, R4, and R5 or used for local irrigation of agricultural areas and wetland enhancement in southern Sonoma Valley and the Napa marshes. The facility has a permitted average dry weather flow of 3.0 mgd (approximately 3,360 AFY) and inflow in 2014 was 4,063 AFY with a projection of 5,110 AFY by 2025.

SVCSD has a well-established system and significant infrastructure for the conveyance, storage, and distribution of recycled water to local users. SVCSD delivers approximately 1,200 AF of recycled water annually for agricultural irrigation. Existing recycled water users are along Highway 121 and Highway 12, Thiodoro Road, Millerick Lane, Ramal Road, and Skaggs Island Road in the western part of the Los Carneros American Viticultural Area. The remaining treated wastewater discharges to wetlands owned by SVCSD in Sonoma Valley and the California Department of Fish and Wildlife. The discharge wetlands are approximately 3.5 miles southeast of the treatment plant, and receive approximately 900 AFY.

Table 3.5-2 presents the WWTP effluent quality data from SCVSD, and the corresponding USEPA, NBWA and UC Division of Agriculture and Natural Resources guidelines for the use of recycled water.

3.5.1.4 MMWD

The Central Marin Sanitation Agency (CMSA) has an NPDES permitted capacity of 10 million gallons per day (mgd). Treated wastewater is currently discharged to the San Pablo Bay. In 2014, wastewater inflow was 13,082 acre-feet per year (AFY). By the year 2025, the facility is projecting to receive 14,891 AFY. **Table 3.5-2** presents the water quality data for effluent discharge of treated wastewater. The effluent water quality data for 2015 indicate that the treated water from CMSA meet all the water quality criteria for discharge.

3.5.1.5 Napa SD

Napa SD's treated wastewater is permitted to be discharged to the Napa River from October 1 to June 30. During the non-discharge dry season (July 1 through September 30 and sometimes longer), treated wastewater is stored in ponds and used to irrigate golf courses, vineyards, landscaping for corporate parks, ball fields, a cemetery, and other landscaping uses.

The Napa SD Water Recycling Facility has two 10-AF recycled water reservoirs on-site with a total permitted capacity of 15.4 mgd (approximately 17,250 AFY). The adjacent WWTP includes four oxidation ponds that total 344 acres. Napa SD typically stores raw water in these ponds and then treats the water immediately before distribution. Wastewater inflow was 9,513AFY in 2014 and is projected to increase to 12,107 AFY by 2025.

Recycled water users are primarily located along the recycled water distribution pipeline at Highway 29 and Jameson Canyon Road and further north along the Napa Valley Highway. In 2005, recycled water customers received 426 MG per year (1,307 AFY) (Napa SD 2005). Napa SD has identified potential future recycled water users in the MST area, including Napa State Hospital.

Table 3.5-2 presents the WWTP effluent quality data from April 2007 to October 2007 provided by Napa SD, and the corresponding USEPA, NBWA and UC Division of Agriculture and Natural Resources guidelines for the use of recycled water.

3.5.1.6 Petaluma Ellis Creek Water Recycling Facility

The City of Petaluma's Ellis Creek Water Recycling Facility (WRF) had a wastewater inflow of 6,122 AFY in 2014 and is projected to receive 6,949 AFY by 2025. Similar to the other WWTPs in the region, the San Francisco Bay RWQCB does not permit the Ellis Creek WRF to discharge to the Petaluma River during the dry season (May 1 through October 20). During this time, Title 22 disinfected tertiary treated recycled water is reused for agricultural irrigation or stored in onsite ponds. The facility has a permitted capacity of 6.7 mgd (approximately 7,500 AFY). Treated water is discharged to Petaluma River. According to the water quality data in **Table 3.5-2**, the Ellis Creek WRF meets the water quality guidelines for discharge.

3.5.1.7 American Canyon Water Reclamation Facility

The City of American Canyon's Water Reclamation Facility has the ability to produce recycled water that meets the Title 22 standards for disinfected tertiary water, which is suitable for a wide range of uses such as landscape irrigation in residential and commercial areas, school yards, parks and playgrounds. The Water Reclamation Facility has a total wastewater treatment capacity of 2.5 MGD (3,363 AFY) at average dry weather flow conditions and 5.0 MGD (6,726 AFY) at peak wet weather flow conditions (UWMP), and is permitted to discharge to the North Slough on the Napa River, and to a constructed wetland that eventually flows to the North Slough (Kennedy/Jenks, 2016).

3.5.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Water Quality issues and used to determine the significance criteria presented in Section 3.5.3.1 is found in **Appendix 3.5A**.

3.5.3 Direct and Indirect Effects

3.5.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, the NBWRP Phase 2 or an alternative would result in a significant impact on water quality if it would:

1. Violate any water quality standards or waste discharge requirements;
2. Substantially alter the existing drainage pattern of the site or area (including through the alteration of the course of a stream or river) in a manner that would result in substantial erosion, siltation, on- or offsite; or
3. Otherwise substantially degrade water quality

TABLE 3.5-2: WWTP EFFLUENT WATER QUALITY

Constituent	Units	Water Quality Guidelines					Petaluma[a]			Novato SD[a]			SVCSD[b]				Napa SD[c]			CMSA[d]			City of American Canyon[e]		
		Recommended Maximum Level for Vineyard Water Quality Needs[f]	Recommended Constituent Limits in Recycled Water for Irrigation[g]	NBWA Values, Degree of Restrictions on Use[h]			Minimum	Average	Maximum	Minimum	Average	Maximum	Desired Range[i]	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum
				None	Slight to Moderate	Severe																				
Aluminum	mg/L	5.0	5.0				0.420	0.420	0.420				None	0.01	0.874	4.3	0.120	0.284	0.510						
Arsenic	mg/L	0.1	0.10				0.00067	0.001	0.0013	0.0005	0.0005	0.0007	None	0.0018	0.0052	0.0170	<0.0005	0.0085	0.011	0.00056	0.00068	0.00081	<0.00045	0.00073	0.0012
Beryllium	mg/L	0.1	0.10				<0.00009	<0.00009	<0.00009				None	0.00	0.0002	0.0001	<0.0001		<0.0005	ND	ND	ND	ND	ND	ND
Bicarbonate	mg/L			<90	90-500	>500	200	225	250				75	43	114.6	150									
Boron	mg/L	1	0.75	<0.7	0.7-3.0	>3.0	0.38	0.455	0.53				<0.5	0.21	0.442	0.60	0.29	0.82	1.87				0.062	0.062	0.062
Cadmium	mg/L	0.01	0.01				<0.00002	0.00004	0.00015	<0.00005	0.00005	0.00005	None	0.00	0.0002	0.0001	<0.1[j]			ND	0.00011	0.00078	ND	ND	ND
Chloride	mg/L	262		<140	140-350	>350	130	145	160				30	74.0000	94.8000	100	6-	160	251				190	190	190
Chlorine residual	mg/L			<1.0	1.0-5.0	>5.0	0.31	0.31	0.31	<.01	<.01	<.01	None				8	8.5	9.1	ND	ND	ND	1.8	4.6	12.9
Chromium	mg/L	0.1	0.1				0.00008	0.00043	0.00094	<0.0005	0.00005	0.00076	None	0.0005	0.0008	0.002	<0.0005	0.0008	0.0012	0.00042	0.0006	0.00095	ND	ND	ND
Cobalt	mg/L	0.05	0.05				0.00026	0.00026	0.00026				None	0.0002	0.0004	0.0005	<0.0005		0.0005						
Copper	mg/L	0.2	0.2				0.00049	0.0036	0.007	0.0013	0.00331	0.0054	None	0.0018	0.0021	0.0026	0.0020	0.0040	0.0076	0.0036	0.0046	0.007	0.0020	0.0040	0.0062
Dissolved Solids	mg/L			<450	450-2000	>2000	560	580	600				<500	370	472	540							576	1213	1865
Fluoride	mg/L	1.0	1.0				0.13	0.13	0.13				None	0.10	0.15	0.28	<0.10		0.18						
Iron	mg/L		5.0	<0.1	0.1-1.5	>1.5	0.04	0.04	0.04	0.00007	0.000145	0.00033	None	0.020	0.084	0.10	<0.05		0.07						
Lead	mg/L	5.0	5.0				0.00008	0.00025	0.00046	<0.00025	<0.00025	<0.00025	None	0.0003	0.0004	0.001	<0.0003		<0.0005	0.0001	0.00016	0.00016	<0.00010	<0.00015	<0.00023
Lithium	mg/L	2.5	2.0				0.0099	0.0099	0.0099				None	0.0078	0.0119	0.014	0.0090	0.0102	0.0120						
Manganese	mg/L	0.2	0.2	<1.0	1.0-5.0	>5.0	0.0021	0.00755	0.013				None	0.0025	0.0266	0.017	0.0001	0.0456	0.0930						
Molybdenum	mg/L	0.01	0.01				0.0014	0.0014	0.0014				None	0.0005	0.0009	0.0018	0.0010	0.0020	0.0033						
Nickel	mg/L	0.2	0.2				0.0013	0.0026	0.012	0.002	0.00353	0.0066	None	0.0024	0.0037	0.0041	0.0036	0.0046	0.0061	0.0035	0.0039	0.0044	0.0035	0.0042	0.0049
pH	Unitless			6.5-8.4					7.62	7.62	7.62	6.7	6.96	7.2	8.125	8.15	9.1100	9.9700					7.2	7.4	8.0
Selenium	mg/L	0.02	0.02				0.00013	0.00023	0.00058	<0.0004	0.000463	0.00074	None	0.0003	0.0029	0.002	<0.001		0.013	ND	0.00032	0.00092	ND	<0.00043	<0.00085
Sodium	mg/L			<3	3-9	>9							<30	60	83.2	97							180	180	180
Sodium Adsorption Ratio	mg/L	3					4.13	4.215	4.3				<6.0	2.32	3.076	3.41	0.6	3.5	4.7				4.6	4.6	4.6
Specific Conductance	mmhos/cm[k]			<0.7	0.7-3.0	>3.0	0.85	0.975	1.10				<750	520	684	760	0.9	1.0	1.3	0.71	2.36	4.39	1.03	2.17	2.95
Vanadium	mg/L	0.1	0.1				0.002	0.002	0.002				None	0.0021	0.0025	0.004	<0.002		0.002						
Zinc	mg/L	2.0	2.0				0.019	0.039	0.082	0.015	0.026	0.036	None	0.0120	0.021	0.03	0.001	0.017	0.024	0.015	0.026	0.034	0.038	0.051	0.062

NOTES:
[a] Values are a compilation of sampling data from January 2015 through December 2015.
[b] Values are a compilation of sampling data for 2014-2017 taken from SVCSD's annual water reclamation at R4 reservoir.
[c] Values are a compilation of sampling data from April 2007 through October 2007 taken from the North San Pablo Bay Restoration and Reuse Project Draft EIR/ EIS, NBWRA 2009.
[d] Results are a compilation of Final Effluent Discharge Data for 2015. CMSA does not currently monitor recycled water.
[e] Data was provided by City of American Canyon staff. If the minimum, maximum, and average values are all the same, then the parameter was likely only tested once during 2015 and may not be a good reflection of actual water quality.
[f] Source: UC Division of Agriculture and Natural Resources, 2006.
[g] Source: USEPA, 2012.
[h] NBWA Recycled Water Characterization.
[i] Desired range as defined by SVCSD.
[j] All sampling events were non-detect less than the value specified.
[k] mmhos/cm = millimhos per centimeter.

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3.5.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 mile of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.5.1: Short Term Construction-Related Effects. Disturbance of soils during construction of new Project-related infrastructure could generate short term erosion-related water quality impacts. Construction activities could result in the accidental release of fuels or hazardous materials. Project construction activities could require dewatering that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks. (Less than Significant with Mitigation)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative, therefore no short-term water quality impacts would occur.

Under the No Action Alternative, it is likely that a subset of water recycling projects would be implemented by Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. These projects would include 12.7 miles of pipeline, and would be subject to the same requirements of the NPDES General Construction Permit to implement BMPs. Therefore, the potential impacts related to water quality would be reduced to a less-than-significant level. The scale of projects, and therefore, the scale of potential impact, associated with the No Action Alternative would be reduced compared to the Proposed Action.

Proposed Action

The Proposed Action would require earthmoving activities such as excavation, trenching, soil stockpiling, and filling that could disturb currently stable soils and result in increased erosion and discharge of sediment to neighboring surface water bodies. Sedimentation to the waterways could degrade water quality that adversely affect beneficial uses by increasing channel sedimentation and suspended sediment levels (turbidity), reducing the flood-carrying capacity, and adversely affecting associated aquatic and riparian habitats. Additionally, sedimentation to local drainage facilities could result in reduced storm flow capacities, resulting in localized ponding or flooding during storm events. Without mitigation, these impacts would be considered potentially significant.

Construction of the proposed recycled water pipelines would involve one of the four potential methods: trenching; jack and bore tunneling; directional drilling; or suspending the pipe (such as in the presence of a bridge). Open cut trenches require excavation and stockpiling of site soils to complete construction of the pipelines. During these activities the stockpiled soils can become susceptible to the effects of wind or water-borne erosion. Trenchless technologies including jack and bore, directional drilling, and suspended completion would have minimal disturbance to site soils and thus would have a less than significant impact to potential erosion-related water quality.

Operation of construction equipment to support the development of project-related infrastructure could potentially result in the accidental release of fuels and other hazardous materials associated with the operation of that equipment to neighboring water bodies in the project area. Hazardous materials associated with construction equipment, such as fuels, oils, antifreeze, coolants, and other substances could adversely affect water quality if inadvertently released to surface waters.

The acreage of land disturbed by individual facility construction would exceed 1.0 acre, the minimum acreage that would initiate the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the NPDES Construction Activity Storm Water Permit requirements. This General Permit mandates the development and implementation of a SWPPP identifying BMPs to reduce erosion of disturbed soils and release of hazardous materials into water courses. As such, Member Agencies or their contractors would prepare a SWPPP requiring implementation of BMPs for erosion and sediment control. These include the use of straw waddles, silt fencing, water detention structures, baker tanks, and other control measures that would limit

construction-related storm runoff. Because these measures would reduce the erosion of soils and release of hazardous materials into water courses, facility construction would not violate water quality standards for construction activities. Preparation of the SWPPP and compliance with implementation and reporting measures identified in the SWPPP would ensure compliance with state regulatory policies to minimize the potential for water quality impacts from construction activities (**Mitigation Measure 3.5.1**). Therefore, impacts to water quality during construction would be reduced to **less than significant with mitigation**.

Earthmoving activities below grade could potentially encounter groundwater and require dewatering actions to handle and dispose of groundwater that would otherwise interfere with construction activities. Groundwater levels vary throughout the project area and depths of excavation would vary with each project component. Project construction activities, particularly trenching (for all project facilities), jack and bore tunneling, and directional drilling (for recycled water pipelines), may intercept groundwater, which would require temporary localized dewatering to facilitate construction. Groundwater would be pumped and discharged to the local drainage system. Water from dewatering operations could contain materials used during typical construction activities such as silt, fuel, grease, or other chemicals. The discharge from construction dewatering would have the potential to affect downstream surface water quality. All discharges of groundwater would occur in compliance with limitations established in the Basin Plan, and may need to implement treatment prior to discharge as required under the permit requirements of the Regional Board. Implementation of **Mitigation Measure 3.5.1**, would reduce impacts to surface water from dewatering activities to a l**ess-than-significant** level.

As is described above, **Mitigation Measure 3.5.1** would reduce the potential impact of construction-related short term stormwater erosion, hazardous material spills, and dewatering effects to a less-than-significant level. **Table 3.5.3** identifies potential impacts for the Proposed Action by project type.

Program Elements

The impacts attributable to erosion and sedimentation during construction of the Program Elements listed in **Table 3.5.3** would be similar to those identified for the Proposed Action. Activities that would create a risk of erosion and sedimentation include trenching and trench dewatering, grading/earth moving, embankment construction, and well installation/drilling muds. As noted under the discussion of the Proposed Action, implementation of **Mitigation Measure 3.5.1** would reduce the severity of these potential impacts. Therefore, the impacts related to construction of any of the Program Elements would be **less than significant with mitigation**.

Storage Alternative

The impacts to erosion and sedimentation under the Storage Alternative would be equivalent and greater than the impacts discussed for the Proposed Action, in proportion to the facilities constructed under this alternative. Impacts for each agency are identified in **Table 3.5.4**.

Mitigation Measures

Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit. Member Agencies or their contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of Notice of Intent to comply with the provisions of this General Permit and preparation of a SWPPP. The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance.

The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation:

1. Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite.
2. Sediment control BMPs such as silt fencing or detention basins that trap soil particles.
3. Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure.
4. Management of hazardous materials and wastes to prevent spills and provide the means to contain any spills that might occur.
5. Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality.
6. Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls.
7. Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.

Impact Significance after Mitigation: Less than Significant.

TABLE 3.5.3: PROPOSED ACTION SHORT TERM CONSTRUCTION RELATED EFFECTS TO WATER QUALITY

	Member Agency	Impact and Mitigation Measure by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary impacts related to construction activities would be within the fence line of existing WRFs. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce impacts to **Less than Significant**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD/CMSA	
Pipeline Projects		
Marin County Lower Nov Creek	Marin Co.	Short-term erosion impacts related to pipeline construction within constructed levees. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SVCSD Napa Road Pipeline	SVCSD	Short-term erosion impacts related to pipeline construction within existing roadways. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
MMWD San Quentin Pipeline	MMWD	
Petaluma Urban Water	Petaluma	
Petaluma Ag Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK V Turnout	Novato SD	Turnout installation would be coordinated with BMK Phase I Levee Installation. Short-term impacts related to construction. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Napa SD Soscol Storage	Napa SD	Short-term erosion impacts related to storage pond construction. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
PROGRAM ELEMENTS		
Pipeline Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Short-term erosion impacts related to pipeline construction within constructed levees. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
City of Petaluma Ag Phase 3	Petaluma	Short-term erosion impacts related to pipeline construction within existing roadways. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Storage or Other Projects		
Novato SD Seasonal Storage	Novato SD	Short-term erosion impacts related to storage pond grading and embankment construction. Drainage channels are located adjacent to the storage site and would be protected from erosion and sedimentation. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Napa SD State Hospital Storage Tank	Napa SD	Short-term erosion impacts related to pipeline construction overland construction. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SCWA Potable Water ASR - Valley of the Moon	SCWA	Short-term erosion and sedimentation impacts related to well installation and drilling muds. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SCWA Potable Water ASR - Sonoma	SCWA	Short-term erosion and sedimentation impacts related to well installation and drilling muds. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.

TABLE 3.5.4: STORAGE ALTERNATIVE SHORT TERM CONSTRUCTION RELATED EFFECTS TO WATER QUALITY

	Member Agency	Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary impacts related to construction activities would be within the fence line of existing WRFs. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce impacts to **Less than Significant**.
Pipeline Projects		
Napa SD MST Northern and Eastern Loop	Napa SD	Short-term erosion impacts related to pipeline construction within roadways. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Short-term erosion impacts related to embankment construction. Standard BMPs per SWPPP requirements and **Mitigation Measure 3.5.1** would reduce potential impacts to **Less than Significant**.
SVCSD Seasonal Storage- Mulas	SVCSD	
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Petaluma	

Impact 3.5.2: Incidental Runoff. Project operation would increase the use of recycled water for irrigation within the project area, with the potential to impact surface water quality. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Under the No Action Alternative, which includes consideration of future conditions, implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

Any of the Member Agencies would still be required to adhere to Title 22 requirements that prohibit over-application of recycled water such that ponding or excess runoff would be unlikely. Also, the use of efficient drip irrigation systems would also be effective in appropriate application of recycled water. These likely uses and the existing regulatory requirements would minimize the potential for the runoff of recycled water applied through irrigation to have **less than significant** impacts on surface water quality.

Proposed Action

The Proposed Action would increase the use of tertiary treated recycled water within the project area for agricultural uses (vineyard irrigation, dairy/pasture, tree and row crops), urban irrigation (including golf courses, parks, and general landscaping) and environmental enhancement. Most of the land that would receive recycled water from the proposed project is currently irrigated with groundwater water, local surface water, or imported surface water supplies.

Over-application of irrigation water could potentially increase the runoff of recycled water into local creeks, streams, and rivers that discharge to San Pablo Bay. Title 22 recycled water use requirements prohibit the over-application of recycled water to the extent that it would cause ponding and/or runoff into adjacent surface water bodies. These policies minimize the potential for the runoff of recycled water applied through irrigation. Also of note, is that areas that irrigate through drip irrigation systems are designed to efficiently irrigate such that excess runoff is minimized. Additionally, the Project's recycled water would be treated to Title 22 requirements for disinfected tertiary recycled water. This quality of water is allowed to be used as a water supply source for agricultural irrigation of food crops, landscape irrigation with high public contact, and non-restricted recreational impoundments. As shown in **Table 3.5-2**, the existing facilities within the Member Agencies are meeting water quality criteria recommended for irrigation.

Therefore, adherence to the Title 22 requirements, continuation of drip irrigation systems and the use of highly-treated water would minimize any adverse effects to surface water quality. The water quality impacts to the receiving waters would be **less than significant**.

Program Elements

The impacts of incidental runoff attributable to those Program Elements that would provide recycled water for irrigation would be similar to those of the Proposed Action. The individual Program Elements would primarily serve agricultural and landscaping purposes and would adhere to Title 22 water treatment and recycled water use requirements, as discussed above. As shown in

Table 3.5-2, the existing facilities within the Member Agencies are meeting water quality criteria recommended for irrigation. The use of drip irrigation systems would promote the efficient application of irrigation water and minimize excess runoff. Therefore, adherence to the Title 22 requirements, continuation of drip irrigation systems and the use of highly-treated water would minimize any adverse effects to surface water quality. The water quality impacts to the receiving waters would be **less than significant**.

Storage Alternative

The impacts to incidental runoff under the Storage Alternative would be equivalent to the impacts discussed for the Proposed Action; all of the Member Agencies would still be required to adhere to Title 22 requirements that prohibit over-application of recycled water such that ponding or excess runoff would be unlikely. Therefore, potential impacts would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.5.3: Public Health. The proposed Project would increase the use of recycled water on lands within the project area, with the potential to affect public health. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Under the No Action Alternative, which includes consideration of future conditions, implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

The majority of the recycled water under this alternative would be used for vineyard irrigation, followed by urban landscaping. The recycled water would still be required to adhere to the water quality requirements and restrictions of Title 22. Therefore, public health impacts from the use and storage of recycled water are expected to be **less than significant**.

Proposed Action

The Proposed Action would increase the use of recycled water within the project area for agricultural, urban and environmental enhancement uses. Recycled water supplies delivered as a part of this project would be treated prior to distribution to meet the requirements of Title 22 for disinfected tertiary recycled water for unrestricted use.

The Member Agencies currently use recycled water in their service areas for various purposes including irrigation of public lands, reclamation of wildlife marshes, golf course irrigation, urban irrigation, recreational facility, and vineyard irrigation.

Public health concerns related to the use of recycled water for irrigation are related to direct interaction and exposure to irrigated areas at public parks and golf courses, potential health effects associated with the consumption of agricultural products irrigated with these supplies, and the potential effects on the health of the crops themselves as it relates to farm and vineyard production levels over the long term.

The California Division of Drinking Water (DDW) has produced Guidelines for Use of Reclaimed Water, which apply to areas receiving water that meets CCR Title 22 Water Recycling Criteria. The guidelines focus on application and management specifications for various recycled water uses, including general use requirements, landscape irrigation requirements, impoundment requirements, and agricultural reuse area guidelines. General requirements include posting signs to inform the public in areas where recycled water is in use, confining recycled water to authorized use areas, using purple pipes to indicate that water distribution and transmission systems contain recycled water, and other requirements designed to ensure that recycled water use does not adversely affect public health through direct interaction. As outlined above, Title 22 also sets use requirements for the separation of areas irrigated with recycled water from domestic groundwater supply wells.

The potential for public health effects resulting from the consumption of food crops irrigated with recycled water was analyzed in a 1998 study completed by the Monterey County Water Recycling Projects Water Quality and Operations Committee (MCWRP, 1998). The study concluded that the recycled water did not contain viable microorganisms of public health concern and further outlined the natural barriers to the transfer of living organisms and organic molecules from irrigation water into plant tissues. The cell walls of roots that absorb and transport water to the edible tissues of crops act as a filter for these organisms and molecules.

In reference to other studies of toxicological effects in humans using recycled water, the advisory panel on chemicals of emerging concern (CECs) found that many recent studies all determined, essentially, no adverse health outcomes in populations using recycled water (SWRCB, 2010). The panel determined that after review of these various studies completed over several decades,

that the predominantly negative findings of any harmful effects all provided multiple lines of evidence that appropriately treated recycled water represents a safe source of water to supplement potable drinking water supplies (SWRCB, 2010).

Non-regulated constituents, or microconstituents and personal care products include a wide variety of chemicals used by society that are assumed to be present in the influent streams of the Member Agency WWTPs. Residues of these inputs have been measured at other WWTPs around the country using similar treatment processes and are assumed to be present in the Member Agencies recycled water streams. As was described above in Section 3.5.1, methods for measuring microconstituents in recycled water have not been established by the USEPA According to the Recycled Water Policy (discussed above in Section 3.5.2), SWRCB in consultation with DDW, held a "blue-ribbon" advisory panel to guide future actions relating to constituents of emerging concern (SWRCB, 2010). As noted above, the panel found that previous studies found no toxicological effects of using recycled water but held that the effects of CECs or microconstituents is a rapidly evolving field and that regulatory requirements need to be based on best available science. The panel or a similarly constituted panel will update this report periodically which is currently scheduled next for a draft report release in 2018. Each report shall recommend actions that the State should take to improve our understanding of emerging constituents and, as may be appropriate, to protect public health and the environment. Permits for recycled water projects shall be consistent both with any DDW recommendations to protect public health and with any actions by SWRCB taken pursuant to paragraph 10(b)(2).

Although there are currently no testing methods or monitoring requirements developed for pharmaceutical compounds, many sanitation districts have started public outreach programs aimed at reducing the amount of pharmaceuticals that are sent to the wastewater system. The Member Agencies participate and coordinate with these programs as part of their regular public outreach programs for pollution prevention. The impact on public health would be **less than significant**.

Program Elements

The Valley of the Moon and Sonoma ASR projects would not involve the use of recycled water. The impacts to public health attributable to each of the remaining Program Elements would be equivalent to the impacts discussed for the Proposed Action. All Member Agencies would be required to adhere to Title 22 requirements, which protect public health. Therefore, the impact is **less than significant**.

Storage Alternative

The impacts to public health under the Storage Alternative would be equivalent to the impacts discussed for the Proposed Action; all of the Member Agencies would be required to adhere to Title 22 requirements that are protective of public health. Therefore, the impact is **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.5.4: Agricultural Uses. The proposed Project would offset the use of potable water supplies for agricultural irrigation. Recycled water quality could have the potential to affect crop production. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Under the No Action Alternative, which includes consideration of future conditions, implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. The majority of the recycled water under this alternative would be used for vineyard irrigation, followed by urban landscaping. The recycled water would still be required to adhere to the water quality requirements and restrictions of Title 22. The tertiary treated recycled water produced from the proposed expansion would still meet the water quality guidelines for the use of recycled water by the USEPA and Title 22. This impact would be **less than significant**.

Proposed Action

The University of California Division of Agriculture and Natural Resources study described above in Section 3.4.1 examined the quality of Napa SD's recycled water and its appropriateness for vineyard applications. The study was followed up in 2014 after reviewing data from 8 years of applying recycled water for irrigation on a vineyard (UCANR, 2014). The study concluded that Napa SD recycled water is satisfactory for vineyards on a long term basis with respect to salinity, chloride, sodium, boron, calcium to magnesium ratio, 24 trace elements (mostly metals), nitrogen, phosphorus, and potassium. The study also concluded that long-term salinity accumulation is not expected to occur when using Napa SD recycled water. In fact, nitrogen levels in recycled water can be

beneficial for vineyards and other crops unless nitrogen levels are already high. For vineyards that do not currently fertilize with nitrogen additives, the use of appropriate cover crops and additional irrigation sources can offset the low amount of nitrogen present in recycled water. The study also stated that recycled water use is consistent with the National Organic Program standards for certified organic vineyards (UC Division of Agriculture and Natural Resources, 2006).

The findings presented for the suitability of using Napa SD recycled water supplies for vineyard irrigation are also assumed to apply to the other Member Agencies recycled water supplies given similar average annual rainfall levels, soil conditions, and recycled water quality treated consistent with Title 22 requirements. Recycled water is already commonly used on vineyards and other agricultural uses without demonstrable adverse effects to agricultural production. Therefore, impacts are considered **less than significant**

Program Elements

The Valley of the Moon and Sonoma ASR projects would not directly involve the use of recycled water. The impacts to agricultural uses attributable to the remaining Program Elements would be similar to those discussed for the Proposed Action. The tertiary treated recycled water provided by each Program Element would meet the water quality guidelines for the use of recycled water set forth by the USEPA and Title 22. Therefore, this impact would be **less than significant**.

Storage Alternative

The impacts to agricultural uses under the Storage Alternative would be equivalent to the impacts discussed for the Proposed Action. The tertiary treated recycled water produced from the proposed expansion would still meet the water quality guidelines for the use of recycled water set forth by the USEPA and Title 22. This impact would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.5.5: Secondary Effects to Groundwater Quality. Irrigation with recycled water could contribute to loading of specific constituents to groundwater. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Under the No Action Alternative, which includes consideration of future conditions, implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding.

For comparison to the Action Alternatives, it is estimated that recycled water would still be available from projects implemented by Member Agencies on an individual basis. Title 22 requirements for use of tertiary treated recycled water would still apply along with existing regulatory requirements including the SWRCB Draft Recycled Water Policy. Therefore, with adherence to these requirements the potential impact of secondary adverse effects on groundwater quality would be **less than significant**.

Proposed Action

As noted above, the expanded availability of recycled water from the Project would include use for irrigation. Irrigation with recycled water could contribute to loading of constituents of concern to underlying groundwater supplies in the vicinity of irrigation sites. Due to the efficiency of vineyard irrigation systems, it is unlikely that a substantial amount of recycled water would be able to percolate through the soils and into the groundwater aquifer. Recycled water that does infiltrate through the vadose zone would likely improve in quality because the soils act as natural filters. Typical ground water quality concerns regarding the use of recycled water include metals, microorganisms (bacteria), total dissolved solids (TDS), and nitrates.

As shown in **Table 3.5-2**, metals in the treated effluent of the participating WWTPs are below their respective MCLs. The UC Davis study of irrigation with recycled water concluded that after months of monitoring, the levels of heavy metals in the NSD recycled water was well below established thresholds of concern for irrigation water (UC Davis, 2014). In addition, metals are generally removed from water in soils through a complex process of adsorption, precipitation, ion exchange, and complexation.

Microorganisms, including bacteria and viruses, are removed from water through filtration, adsorption, desiccation, predation, disinfection, and exposure to other adverse conditions. Bacteria, including coliform, are removed by filtration through the soil; in general, there is greater filtration of bacteria in fine-grained material than in course-grained material. Studies of wastewater application indicated that coliforms are normally removed after five feet of percolation through the soil (USEPA, 1981).

The drinking water MCL for nitrate (as nitrogen) is 10 mg/L. Nitrate is absorbed by plants, and is readily immobilized in the unsaturated zone through absorption. However, once in the ground water, nitrate is relatively stable and mobile. The level of nitrate present in NBWRP treated recycled water would typically be less than the nitrate requirement of crops, and would be expected to be readily absorbed. Therefore, the potential for nitrate loading to affect groundwater quality within the area of irrigation is considered low.

The TDS levels in recycled water supplies is anticipated to average approximately 410 mg/L. This level is below the drinking water MCL of 500 mg/L, and is generally equivalent or below groundwater TDS within the proposed irrigation areas. In addition, the expanded use of recycled water would in some instances replace the local groundwater use. The repeated use of local groundwater supplies can result in a buildup of residual salinity which is reflected in TDS measurements. Therefore, irrigation with recycled water is not anticipated to significantly affect TDS levels in local groundwater supplies. The SWRCB Draft Recycled Water Policy encourages every region in California to develop a salt/nutrient management plan that is sustainable on a long-term basis and that provides California with clean, abundant water. These plans shall be consistent with the Department of Water Resources' (DWR) Bulletin 160, as appropriate, and shall be locally developed, locally controlled and recognize the variability of California's water supplies and the diversity of its waterways. The Sonoma Valley Salt and Nutrient Management Plan was developed in 2013. Therefore, based on the Title 22 water quality requirements of the treated recycled water, the ability to reduce local groundwater use, and compliance with existing regulations, the potential impact of secondary adverse effects on groundwater quality would be **less than significant**.

Program Elements

The Valley of the Moon and Sonoma ASR projects would not involve the use of recycled water and not contribute to the loading of recycled water constituents in groundwater. Therefore, there would be **no impact**.

The impacts to groundwater attributable to the Program Elements would be of the same character as those discussed for the Proposed Action. Therefore, based on the Title 22 water quality requirements of the treated recycled water, the ability to reduce local groundwater use, and compliance with existing regulations, the potential impact of secondary adverse effects on groundwater quality would be **less than significant**.

Storage Alternative

The impacts to groundwater under the Storage Alternative would be equivalent to the impacts discussed for the Proposed Action; therefore, based on the Title 22 water quality requirements of the treated recycled water, the ability to reduce local groundwater use, and compliance with existing regulations, the potential impact of secondary adverse effects on groundwater quality would be **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.5.6: Pipeline Rupture. Pipeline ruptures could generate accidental releases of recycled water. (Less than Significant)

No Project/No Action Alternative

The NBWRP Phase 2 would not be implemented under the No Project Alternative; therefore, **no impact** would occur.

Under the No Action Alternative, which includes consideration of future conditions, implementation of local plans for expansion of water recycling projects would occur by any one or more of the Member Agencies on an individual basis, without the benefit of regional coordination, or federal funding. Construction of new independent wastewater recycling projects within each service area would develop new recycled water conveyance pipelines that would incorporate the same safety measures that would be included in new pipelines developed by the proposed project, described above. The effects generated by an emergency pipeline rupture under the No Project Alternative/No Action Alternative are anticipated to be **less than significant**.

Proposed Action

Pipeline ruptures as a result of an earthquake or other unforeseen events could potentially generate a discharge of recycled water to surface water bodies within the project area. The design and construction of new pipelines will incorporate features and operational procedures to minimize the risk of water quality impacts in the event of emergency pipeline rupture, including:

1. Inspections of all pipelines for adherence to construction standards;

2. Leak detection system; and
3. Placement of block valves to allow sections of pipelines to be shut off in the event a leak is detected.

In addition, the recycled water conveyed through pipelines developed as a part of the project alternatives would be treated to meet Title 22 disinfected tertiary requirements. Water quality impacts to surface water bodies in the project area associated with a leak or spill from a recycled water pipeline would be considered **less than significant**.

Program Elements

The Valley of the Moon and Sonoma ASR projects would not involve the use of recycled water. Therefore, there would be **no impact**.

The impacts to groundwater attributable to the Program Elements would be of the same character as those discussed for the Proposed Action. The recycled water stored in storage facilities and conveyed through pipelines developed as components of the Program Elements would be treated to meet Title 22 disinfected tertiary requirements. Water quality impacts to surface water bodies in the project area associated with a leak or spill from a recycled water pipeline would be considered **less than significant**.

Storage Alternative

The impacts to groundwater under the Storage Alternative would be equivalent to the impacts discussed for the Proposed Action; the recycled water stored in storage facilities and conveyed through pipelines developed as a part of the project alternatives would be treated to meet Title 22 disinfected tertiary requirements. Water quality impacts to surface water bodies in the project area associated with a leak or spill from a recycled water pipeline would be considered **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.5.3.3 Impact Summary by Service Area

Appendix 3.5B provides a summary of potential Project impacts per Member Agency related to water quality.

3.6 Biological Resources

This section describes existing wildlife (including special-status species and species listed under the federal or state Endangered Species Acts), vegetation communities, and wetland resources in the project area (Section 3.6.1, *Affected Environment*). Section 3.6.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the proposed action, and summarizes such effects by service area. Study areas were established for each of the proposed facilities or facility types, and biological resources were identified within these areas to assess the direct (footprint) and indirect effects (such as construction noise, light, or erosion) of the project on biological resources. The *Cumulative Impacts* are analyzed in Section 4.0. All figures referred to in this section are available in Appendix A. Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.6A. During scoping for this EIR/EIS, no comments or other input were received regarding biological resources.

3.6.1 Affected Environment

This evaluation of biological resources is based on the following: field surveys; aerial photograph interpretation; and database review of vegetation communities, wildlife habitat, and jurisdictional "waters of the United States" or "waters of the state" that occur near the project area. Reconnaissance-level field surveys for the Phase 2 Project were conducted in August and September 2017 to identify habitat that could support special-status plant and wildlife species. These surveys were used to update and augment existing information on biological resources and to verify the results of previously produced biological reports.

The following resources were consulted to prepare an initial list of plant and wildlife species considered for potential effects of NBWRP Phase 2: California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database ([CNDDB], (CDFW, 2017)), the California Native Plant Society (CNPS) online inventory (CNPS, 2017), U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) environmental conservation online system (USFWS, 2017), and the National Oceanic and Atmospheric Administration online Google Earth species list tool by the National Marine Fisheries Service (NMFS) (NMFS, 2017).

Vegetation communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. When possible, the vegetation community descriptions and terminology used are based on *A Manual of California Flora* (Sawyer and Keeler-Wolf, 1995), the CDFW *List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database* (CDFW, 2017), and Holland's *Preliminary Description of Terrestrial Natural Communities of California* (Holland, 1986).

3.6.1.1 Vegetation Communities

Vegetation community descriptions within each service area are provided in **Appendix 3.6A**. Vegetation community descriptions and species accounts within each service area are provided below. Species accounts are prefaced by a table (**Appendix 3.6B**) indicating which species may occur by service area and project alternative.

3.6.1.2 Special-status Species

Certain plant and wildlife species are considered as having "special-status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection from federal or state endangered species legislation. Other species have been designated as "sensitive" on the basis of the following: adopted policies and expertise of state resource agencies; organizations with acknowledged expertise; or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives.

A focused database and literature search for the project area and vicinity identified more than 40 special-status plants and more than 50 special-status wildlife species with potential to occur in the recycled water service areas. **Appendix 3.6B** lists these species, their potential habitat, and the potential for occurrence within 40 feet of the alignment. For alignments coincident with existing roadways, a distance of 40 feet is measured on each side of the road from the edge of pavement; the total widths for off-road alignments are not precisely defined but a buffer area of approximately 50 feet on each side of the centerline was evaluated for potential special status species habitat. No focused or protocol-level wildlife surveys were conducted in support of the proposed project. However, suitable habitat for several special status species occurs within the project area. Species that occur or have high potential to occur within the project area are discussed in Species Accounts below.

Special-status Plants

The initial list of special-status plants which occur in the general project region and potentially occurring within the project area was compiled on the basis of database searches described in Section 3.6.1. The Draft EIR and Final EIR for NBWRP Phase I were also consulted (Bureau of Reclamation, 2009).

Appendix 3.6B lists the special-status plant species with potential to occur that were identified in the vicinity of the project area. The table indicates all service areas where special status plants have potential to occur. These include local sightings of Sonoma sunshine (*Blennosperma bakeri*; federal and state endangered), Franciscan onion (*Allium peninsulare* var. *franciscanum;* Rank 1B), and Napa false indigo (*Amorpha californica* var. *napensis*; Rank 1B). The precise distribution of these species in the project area is unknown. As indicated in Section 2.0, Project Description, pipeline installation would occur primarily within the road right-of-way, with precise pipeline alignment determined during design.

Protocol-level or focused plant surveys have not been performed for any of the project alignments for NBWRP Phase 2. For the NBWRP Phase 1 EIR/EIS, rare plant surveys were conducted for the pipeline alignments that had been analyzed in the Sonoma Valley Recycled Water Project (SVRWP) EIR (ESA, 2006). These surveys were conducted for Napa false indigo (*Amorpha californica* var*. napensis*), Sonoma sunshine, narrow-anthered California brodiaea (*Brodiaea californica* var. *leptandra*), dwarf downingia (*Downingia pusilla*), largeleaf filaree (*Erodium macrophyllum*), legenere (*Legenere limosa*), Jepson's leptosiphon (*Leptosiphon jepsonii=Linanthus jepsonii*), Mt. Diablo cottonweed (*Micropus amphibolus*), and oval-leaved viburnum (*Viburnum ellipticum)*. None of the target species were observed in the SVRWP project area during appropriately-timed botanical surveys (ESA, 2006). The disturbed nature of other undeveloped portions of the project sites in combination with the presence of non-native annual grasses that favor disturbed areas likely prohibit establishment of special-status plant species in most areas. Appropriately-timed surveys for special-status plant species would be needed prior to project implementation to confirm the absence of rare plants in these areas.

Special-status Fish and Wildlife

An initial list of special-status fish and wildlife species known to occur in the general project region and potentially occurring within the project area was compiled from databases discussed in Section 3.6.1; review of pertinent scientific literature about the sensitive species of concern (e.g., Moyle, 2002; Leidy, 2007); and ESA biologists' familiarity with local wildlife resources. The previously prepared EIR/EIS for Phase I was also consulted (Bureau of Reclamation, 2009). Appendix 3.6B lists the special-status wildlife species with potential to occur that were identified in the vicinity of the project area. The table indicates all service areas where special status wildlife have potential to occur.

Reconnaissance-level surveys in the project area were conducted in 2017 on August 25 and 29; and on September 13 and 25 to assess available habitat in the project area. The habitat assessment considered factors such as available habitat, habitat quality, and species distribution in evaluating the likelihood of special-status species occurrence in the project area. Focused protocol-level surveys were not conducted for any special-status fish or wildlife species. Therefore, the potential for species' presence was determined based on habitat suitability and CNDDB occurrences (CDFW, 2017). The general ecology for special-status species identified as having the greatest potential to occur in or near the proposed project are described below.

Fish. Based on the results of the review, a total of nine special-status fish species have been identified in the project area, including San Pablo Bay. Of these nine species, two are presumed extirpated from San Francisco Bay drainages (Coho salmon (*Oncorhynchus kisutch*), and tidewater goby (*Eucyclogobius newberryi*)), though goby has potential to repopulate; four are known to occur in San Pablo Bay and may occur in the lower tidal reaches of project area drainages, but are not expected to occur within the freshwater portions of project area streams and rivers (delta smelt (*Hypomesus transpacificus*), green sturgeon (*Acipenser medirostris*), longfin smelt (*Spirinchus thaleichthys*), and Sacramento splittail (*Pogonichthys macrolepidotus*)); and three have a high potential to occur both in San Pablo Bay and in project area drainages (central California coast steelhead, Chinook salmon (*Oncorhynchus tshawytscha*), and Pacific lamprey).

Wildlife. Potential habitat was identified for 50 special-status species within the project region, of which several are present or presumed present in or near the project area: seven state or federal threatened or endangered species (California freshwater shrimp, California red-legged frog (*Rana draytonii*), western snowy plover (*Charadrius alexandrinus nivosus*), California black rail (*Laterallus jamaicensis*), Ridgway's rail (*Rallus obsoletus obsoletus*), and salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*)) and two other special-status species (western pond turtle (*Actinemys marmorata*), and pallid bat (*Antrozous pallidus*)). On the basis of this biological resources analysis, it was determined that habitat for threatened, endangered, and otherwise special-status wildlife species near the proposed project alignment is generally restricted to within stream corridors, ponds, freshwater marshes, grasslands, salt pond levees, salt marshes, and areas in the immediate vicinity of such features that are crossed by proposed pipelines or adjacent to proposed alignments within existing roadways. Public road rights-of-ways in the project area are not particularly sensitive relative to these special-status species.

Special-status Vegetation Communities

Northern Coastal Salt Marsh. Northern coastal salt marsh is usually found along sheltered inland margins of estuaries, lagoons and bays that are subject to regular tidal influence. Vegetation changes with the salinity gradient but always consists of salt-tolerant plants, usually perennials that form a moderate to dense land cover. Vegetation characteristic of northern coastal salt marsh includes pickleweed, saltgrass (*Distichlis spicata*), alkali heath (*Frankenia grandifolia*), marsh gumplant (*Grindelia stricta*), and California cordgrass. Adjacent communities include valley grassland and freshwater marsh. Northern coastal salt marsh occurs in lower Novato Creek and the turnout to transitional wetlands in the Hamilton Wetland, and adjacent to the

Petaluma Agricultural Recycled Water Expansion area. Northern coastal salt marsh occurs in or near the project area at the above stated locations and in the Lower Novato Creek Restoration Area.

Coastal Brackish Marsh. Coastal brackish marsh communities are similar to coastal salt marsh communities but receive freshwater from area creeks and drainages. Salinity levels fluctuate with rainfall and drainage patterns, and with tidal variations. Brackish marshes usually intergrade with coastal salt marshes along coastal or bay fringes and with freshwater marshes at upstream drainages. Vegetation is usually dense and dominated by tall, perennial monocots that can reach six feet in height. Typical vegetation includes sedges (*Carex* spp.), rushes (*Juncus* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Coastal brackish marsh occurs in lower Novato Creek upstream from salt marsh, and adjacent to the Petaluma Agricultural Recycled Water Expansion Area. This vegetation community occurs in or near the project area at the Novato restoration site and the adjacent pipeline locations.

3.6.1.3 Species Accounts

Occurrences of special-status plants and wildlife in the vicinity of project elements are shown on **Figures 3.6-1** through **3.6-6** in **Appendix A**. A discussion of special status plants and wildlife in the vicinity of project elements is provided in **Appendix 3.6A**.

3.6.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Biological Resource issues and used to determine the significance criteria presented in Section 3.6.3.1 is found in **Appendix 3.6A**.

3.6.3 Direct and Indirect Effects

3.6.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would result in a significant impact to biological resources if it would:

1. Substantially diminish habitat for fish, wildlife, or plants species;
2. Result in a fish or wildlife population to drop below self-sustaining levels;
3. Threaten elimination of a plant or animal community;
4. Substantially affect an endangered, rare, or threatened species of animal or plant or the habitat of the species;
5. Decrease the number of or diminish the range of an endangered, rare, or threatened species;
6. Interfere substantially with the movement of any native resident or migratory fish or wildlife species; impede use of native wildlife nursery sites;
7. Substantially degrade the quality of the environment, including but not limited to:
    a. the substantial adverse effect on or loss of federally protected wetlands,
    b. the substantial degradation or loss of habitat, sensitive natural communities, or other resources identified in local or regional plans, policies, regulations or by lists compiled by CDFW or USFWS; or
8. Conflict with any local policies or ordinances protecting biological resources or with provisions of an adopted habitat conservation plan; natural community conservation plan; or other local, regional, or state habitat conservation plan.

CEQA Section 15380 further provides that a plant or animal species may be treated as "rare or endangered" even if it is not on one of the official lists if, for example, the species is likely to become endangered in the foreseeable future.

3.6.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 mile of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within member agency service areas. This would include the construction of a

total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water and 1.8 miles of pipeline in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.6.1: Impacts on Wetlands, Streams and Riparian Habitats. Construction of NBWRP Phase 2 could result in impacts to jurisdictional wetlands and other waters of the United States, as well as impacts to waters of the State and riparian habitat. (Less than Significant with Mitigation)

Potential impacts could involve temporary and permanent discharge of fill material into jurisdictional wetlands and other waters of the U.S. to accommodate construction activities. Wetlands or drainages could be affected by pipeline trenching activities, bore and jack installation under streams, and other construction activities, and temporary filling of seasonal wetlands in work areas.

Potential impacts to riparian habitat include temporary and permanent disturbance of stream channels during construction activities, including removal or disturbance to riparian vegetation, and alteration of bed and banks of drainages due to trenching. While trenchless technology is planned for all 36 crossings, if it is infeasible at certain locations, trenching may be used. At crossings, a pipeline trench 25 feet wide would be dug, across a riparian corridor with a maximum width of 10 feet, thus impacting 250 square feet of riparian habitat at each crossing, or a maximum of 9,000 square feet (0.2 acres) at all 36 crossings.

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NPBWP Phase 2. Therefore, no impacts to stream crossings or wetlands would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the Phase 2 Program projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project 1 – Distribution (Novato SD), Turnout to Wetlands (Novato SD), Urban Recycled Water Expansion (Petaluma), and the first phase of American Canyon's Recycled Water Distribution System Expansion. As noted below in the evaluation of the Proposed Action, all of these projects have the potential to impact wetlands and riparian areas. Wetlands and riparian areas will be avoided to the maximum extent practicable. A jurisdictional determination will be required for any potential wetlands present. Impacts to jurisdictional wetlands or riparian areas would be potentially significant. Implementation of **Mitigation Measure 3.6.1** would reduce these impacts to a less-than-significant level.

Proposed Action

Collectively, the NBWRP Phase 2 would provide 4,902 AF of new recycled water for beneficial use and would include: installation of 20.6 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 4.87 mgd of tertiary treatment capacity, and development of approximately 10.2 AF of storage, primarily for agricultural use.

As noted in Section 3.2, Surface Hydrology, implementation of NBWRP Phase 2 would have the potential to cross 36 streams. All stream crossings would be designed using trenchless technology or attached to bridge structures to avoid potential impacts to stream channels and waters of the U.S. and State. Potential wetland and riparian features are present along the channel crossings in the City of Petaluma, SVCSD and City of American Canyon service areas, at the turnout to transitional wetland at Bel Marin Keys and along the alignment at Lower Novato Creek, and in the vicinity of the storage facility site at the Soscol WRF in Napa SD. There are no potential riparian areas or jurisdictional wetlands that would be affected by MMWD facilities.

The project would avoid impacts to wetlands and riparian areas to the maximum extent practicable. A jurisdictional determination will be required for any potential wetlands present. Impacts to jurisdictional wetlands or riparian areas would be potentially significant. The project would comply with the provisions of all federal and state permits, including mitigation for any wetland impacts due to unavoidable trenching (maximum of 0.2 acres for the project). Implementation of **Mitigation Measure 3.6.1** would further reduce these impacts to a less-than-significant level.

Program Elements

The Program Elements would provide additional capacity for certain locations. Novato SD would store 150 AF of tertiary recycled water and one 700 gmp pump station, and would deliver 860 AFY of recycled water to agricultural customers. Napa sanitation District would provide an additional 5 mg operational storage tank and a project yield of 429 AFY. SCWA ASRs would provide an approximate total of 140 AFY of injected potable water. The two program elements included for the City of American Canyon, collectively include 3,450 LF of 8-inch-diamter pipelines and 1,800 LF of 6-inch-diamter pipelines.

Programmatic projects also have the potential to impact wetland and riparian features, particularly at the Napa State Hospital Storage Tank site in Napa SD, and the Lower Novato Creek Project Restoration site in Novato SD. The American Canyon

Recycled Water Distribution System Expansion Projects has one crossing, the City of Petaluma programmatic expansion area has 6 crossings, and Napa State Hospital alignment has one crossing. These crossings may involve impacts to riparian features or wetlands. There are no crossings at the SCWA ASR sites.

The project will avoid impacts to wetlands and riparian areas to the maximum extent practicable. A jurisdictional determination will be required for any potential wetlands present. Impacts to jurisdictional wetlands or riparian areas would be potentially significant. Implementation of **Mitigation Measure 3.6.1** would reduce these impacts to a less-than-significant level.

Storage Alternative

As with the Proposed Action, construction of the elements of the Storage Alternative have the potential to impact wetlands and riparian areas. The Storage Alternative would avoid impacts to wetlands and riparian areas to the maximum extent practicable. A jurisdictional determination would be required for any potential wetlands present. Impacts to jurisdictional wetlands or riparian areas would be potentially significant. Implementation of **Mitigation Measure 3.6.1** would reduce these impacts to a less-than-significant level.

Mitigation Measures

Mitigation Measure 3.6.1: Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and State and impacts to riparian habitat.

Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to Section 401 of the Clean Water Act. Proposed facilities would most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The CDFW has jurisdiction in the project area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFW jurisdiction. If work is proposed in these areas, project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFW. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below.

1. Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include:
    a. Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90 degree angle) to the drainage or wetland as feasible.
    b. Placement of project components as distant as feasible from channels and wetlands.
    c. For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback from jurisdictional features[1]. Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments.
2. Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used.
3. Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings (e.g., Lynch Creek). Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat.

    The following additional measures shall apply to channel crossings in which the trenching construction method is used:

    a. Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15.
    b. At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.

[1] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

c. At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing.

d. If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

4. Construction BMPs shall be implemented as discussed in Mitigation Measure 3.5.1a in Section 3.5, Water Quality, to reduce risk of erosion and sediment transport into all construction areas in proximity of drainages.

5. For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.

6. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.

7. To offset temporary and permanent impacts to wetlands and other waters of the U.S. and State, and impacts to riparian habitat, compensatory mitigation will be provided through on-site restoration to emulate pre-project conditions, or as required by regulatory permits and SAAs.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.2: Impacts to Fish and California Freshwater Shrimp. Construction of NBWRP Phase 2 facilities could affect special-status aquatic species including central California coast steelhead, Chinook salmon, and California freshwater shrimp, or designated critical habitat for steelhead. (Less than Significant with Mitigation)

Under the proposed action, trenchless methods (e.g., suspending pipes from bridges or directional drilling) will be employed at perennial stream crossings, and seasonal streams will be dry during construction. During the course of construction activities both near and at stream crossings, the potential exists for accidental spills of drilling muds such as bentonite, gasoline, oil, or other toxic substances. During directional drilling activities, drill head lubricants sometimes escape through soil fractures to the surface, termed a "frac-out," and spill into upland or aquatic environments. The release of such materials into streams can be deleterious to fish and otherwise damaging to aquatic environs depending upon the sensitivity of receiving waters, timing of the spill, magnitude of the release and the scale of cleanup activities. In the event of a materials spill, impacts could be experienced during site cleanup activities. Such impacts could include direct mortality by escaped materials or cleanup equipment, and temporary degradation of habitat.

In some locations, further geotechnical investigation may reveal that open trench methods will be necessary. In the event that trench installation is necessary, surface and/or groundwater flows would be diverted during trenching, pipe-laying, and backfilling activities. A temporary diversion channel or pipe would divert flows around the construction area. In addition to diverting surface flows, underground flows and groundwater would be collected and pumped to a point downstream of the construction site.

All dewatering operations would comply with SWPPP requirements and requirements of the Regional Water Quality Control Board (RWQCB) and other jurisdictional agencies. In order to meet these requirements, bypass water may be pumped directly around work areas, or it may be pumped to a temporary sedimentation basin to later be returned to the channel. The pipeline would be installed within an excavated trench below the scour depth of the stream bed as determined by design. Following installation, the stream channel would be restored to pre-project gradient and a restoration plan would be developed and implemented.

Anticipated equipment includes excavators for trenching and pipe-laying, trucks for hauling material, concrete pumper trucks, and pumps, hoses, and other miscellaneous construction equipment. Once the water diversion system is in place and the construction site is dewatered, all equipment would operate within the dewatered area or entirely outside the channel.

The following potential effects to steelhead, Chinook, other special-status fish such as Pacific lamprey, or designated critical or essential fish habitat may result from open trench pipeline crossings:

1. Injury or mortality from being crushed by earth-moving equipment, construction debris, and worker foot traffic;

2. Injury or mortality as a result of improper capture, handling, containment, or transport of individuals during preconstruction capture and relocation activities;

3. Injury or mortality resulting from short-term sedimentation and turbidity that may occur during construction and removal of cofferdams;

4. Injury or mortality during dewatering activities;
5. Injury or mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats;
6. Temporary destruction of salmonid habitat through alterations of the stream substrate, downstream sedimentation, and the temporary loss of riparian vegetation and stream function as fishery habitat.

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NPBWP Phase 2. Therefore, no impacts to special status aquatic species would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the Phase 2 Program projects would be pursued in the absence of Title XVI funding. As noted below in the evaluation of the Proposed Action, the City of American Canyon crossing of North Slough and the City of Petaluma's crossing at Lynch Creek have the potential to impact listed and special-status fish species. The Turnout to Wetlands and Lower Novato Creek projects do not cross perennial waterways and therefore would not impact special-status fish species. Adverse effects to steelhead, Chinook, other special-status fish or designated critical habitat or essential fish habitat from inadvertent bentonite releases or from construction of above-ground suspended pipeline crossing would be potentially significant effects. Implementation of **Mitigation Measure 3.6.2** would reduce these impacts to a less than significant level.

Proposed Action

The NBWRP Phase 2 pipeline alignments cross or bridge 36 intermittent, seasonal, and perennial drainages throughout the recycled water service areas. Most of the crossings will occur on seasonal and intermittent streams that are expected to be dry at the time of construction. The potential direct effects from construction of the proposed action would only occur at those stream crossings where salmonids are known or presumed to be present, or where critical habitat or essential fish habitat has been designated. A total of three stream crossings in the action area were identified as potentially supporting listed salmonids or as designated critical habitat or essential fish habitat.

Of the 36 total stream crossings, the proposed action would cross three streams documented to support, or to have historically supported, threatened or endangered fish: North Slough, Arroyo Seco and Lynch Creek. Lynch Creek is a tributary to the Petaluma River in the City of Petaluma service area. North Slough is a tributary to the Napa River in the City of American Canyon. Arroyo Seco is a tributary to Schell Creek in the SVCSD service area.

Pipelines will be installed using trenchless methods such as bore and jack tunneling or directional drilling. While these underground pipeline installation methods avoid most of the potential effects associated with open-trench construction, salmonids may be affected by potential releases of construction materials into the watercourse. Bentonite clay, used as a lubricant during underground drilling activities, may enter bedrock fissures and subterranean connections to the streambed. Adverse effects to steelhead, Chinook, other special-status fish or designated critical habitat or essential fish habitat from inadvertent bentonite releases or from construction of above-ground suspended pipeline crossing would be potentially significant effects. Implementation of **Mitigation Measure 3.6.2** would reduce these impacts to a less than significant level.

Program Elements

The NBWRP Phase 2 Program Element pipeline alignments cross 8 additional drainages throughout the recycled water service areas. All of these crossings will occur on seasonal and intermittent streams that are expected to be dry at the time of construction. The potential direct effects from construction would only occur at stream crossings where salmonids are known or presumed to be present, or where critical or essential fish habitat has been designated. Adverse effects to steelhead, Chinook, other special-status fish or designated critical habitat or essential fish habitat from inadvertent bentonite releases, or from construction of above-ground suspended pipeline crossing, would be potentially significant effects. Implementation of **Mitigation Measure 3.6.2** would reduce these impacts to a less than significant level.

Storage Alternative

The Storage Alternative includes additional storage, treatment and distribution facilities to provide operational flexibility within member agency service areas. Adverse effects to steelhead, Chinook, other special-status fish or designated critical habitat or essential fish habitat from inadvertent bentonite releases at crossing, or from construction of above-ground suspended pipeline crossings, would be potentially significant effects. Implementation of **Mitigation Measure 3.6.2** would reduce these impacts to a less than significant level.

Mitigation Measures

Mitigation Measure 3.6.2: Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp.

Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFW, and USACOE), and implementing protective measures. For Lynch Creek, North Slough, and Arroyo Seco, special-status fish are presumed present. California freshwater shrimp are presumed present in Arroyo Seco. Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat:

1. Project designs shall be configured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible. Trenchless constructions methods will be employed wherever possible. In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements.
2. All activities across waterways will be restricted to low-flow periods of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in accordance with CDFW and RWQCB permit requirements). Restricting construction activities to this work window will minimize effects to California freshwater shrimp and steelhead;
3. Reclamation or appropriate agency shall ensure the appropriate permit authorizations are secured for stream crossings, and a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California freshwater shrimp during construction operations;
4. At least 15 days prior to onset of activities, Reclamation or appropriate agency shall submit the name(s) and credentials of biologists who would conduct activities authorized by the BO. No project activities shall begin until Reclamation has received written approval from the USFWS and CDFW that the biologist(s) is approved to conduct the work;
5. A Service-approved biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the California freshwater shrimp and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action;
6. If trenchless methods cannot be implemented due to geotechnical conditions, and the channel is not dry, water from around the section of trench that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to affect downstream resources. Sediment curtains will be placed downstream of the construction zone to prevent disturbed sediment from being transported and deposited outside of the construction zone;
7. If ground water is encountered, or if water remains in the channel after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997);
8. Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential California freshwater shrimp or steelhead habitat;
9. A qualified biological monitor will be on site during all activities crossing waterways. The biological monitor will be authorized to halt construction if effects to California freshwater shrimp or salmonids are evident.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.3: Impacts on Reptiles and Amphibians. Construction of NBWRP Phase 2 has the potential to impact California red-legged frog and western pond turtles in upland and aquatic habitat. (Less than Significant with Mitigation)

Trenchless crossing methods (e.g., suspending pipes from bridges or directional drilling) would be employed at stream crossings. Construction methods in the vicinity of these crossing sites for installation of pipelines would be minimally invasive, utilizing open trench methods either within or adjacent to roadways.

Assuming that the identified creeks will be traversed by trenchless techniques (e.g., directional drilling), impacts on California red-legged frogs and western pond turtles would be avoided to the maximum extent possible. Impacts may include:

1. Injury or mortality from being crushed by earth moving equipment, debris, and worker foot traffic;
2. Work activities, including noise and vibration causing frogs to leave suitable habitat;
3. Mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats, or;
4. Injury or mortality as a result of handling, containment, or transport of individuals from active work locations.

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NPBWP Phase 2. Therefore, no impacts to California red-legged frog or western pond turtle would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the NBWRP Phase 2 projects as discussed above under Impact 3.6.1, would be pursued in the absence of Title XVI funding. As noted below in the evaluation of the Proposed Action, impacts to California red-legged frog or western pond turtle at Lynch Creek would be potentially significant. Implementation of **Mitigation Measure 3.6.3** would reduce these impacts to a less than significant level.

Proposed Action

NBWRP Phase 2 would installation of pipelines and construct facilities across the six service areas as discussed above under Impact 3.6.1. Pipelines would cross 36 waterways. In the absence of focused California red-legged frog or western pond turtle surveys, these species are presumed present within available perennial aquatic habitat and adjoining upland environs at North Slough (City of American Canyon), Arroyo Seco (SVCSD), and Lynch Creek (City of Petaluma). Upland construction methods in the vicinity of these crossing sites are expected to be minimally invasive, utilizing open trench methods either within or adjacent to existing roadways. The USFWS programmatic biological opinion for impacts to California red-legged frogs (USFWS, 2014) identified typical effects that could occur to this species as a result of the proposed action, listed above, including injury or mortality to individual frogs and abandonment of habitat due to disturbance.

Impacts to California red-legged frog or western pond turtle from construction would be potentially significant. Implementation of **Mitigation Measure 3.6.3** would reduce these impacts to a less than significant level.

Program Elements

The Program Elements would provide additional capacity in the Novato SD, Napa SD, SCWA, and City of American Canyon service areas. These sites do not include perennial waterways and therefore would not impact California red-legged frog or western pond turtle or their habitat. No impacts are expected.

Storage Alternative

The Storage Alternative includes additional storage, treatment and distribution facilities to provide operational flexibility within the following member agency service areas: Novato SD, Napa SD, Petaluma Ellis Creek WRF, and SVCSD. The storage facility along Highway 37 in the SVCSD and planned tidal marsh restoration in the Novato SD would include disturbance to marsh vegetation that may provide habitat to red-legged frog and western pond turtle.

Impacts to California red-legged frog or western pond turtle from construction of these facilities would be potentially significant. Implementation of **Mitigation Measure 3.6.3** would reduce these impacts to a less than significant level.

Mitigation Measures

Mitigation Measure 3.6.3: Implement protection measures to avoid and minimize impacts to western pond turtles and California red-legged frogs.

1. The implementation of measures identified for the protection of special-status fish and California freshwater shrimp would also protect California red-legged frogs and western pond turtles within aquatic habitat. When working within 200 feet of stream crossings, workers shall receive specific training in the identification, life history, local project area occurrence, and protection of western pond turtles and California red-legged frogs. Also, to minimize the likelihood of encountering turtles or frogs in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads, the project will be outside of frog and pond turtle habitat.
2. Trenchless methods will be employed at crossings presumed or known to support California red-legged frog. In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements;
3. To the extent practicable, work activities within or adjacent to aquatic habitat that is potentially occupied by red-legged frogs will be completed between April 1 and October 31, which avoids the time period when California red-legged frogs are most likely to move through upland areas.
4. Prior to construction activities at stream crossings where aquatic impacts are expected, a qualified biologist shall perform California red-legged frog and western pond turtle surveys within suitable habitat within projected work areas. If California red-legged frogs or western pond turtles are encountered during construction activities, work in the immediate area shall cease until the area is determined to be free of sensitive species. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and

release hatchlings into the creek system in late fall. If California red-legged frog tadpoles or eggs are found, the biologist shall contact the USFWS to determine if moving any of these life-stages is appropriate.

5. At least 15 days prior to onset of activities, Reclamation or appropriate agency shall submit the name(s) and credentials of biologists who would conduct activities authorized by the BO. No project activities shall begin until Reclamation has received written approval from the USFWS that the biologist(s) is approved to conduct the work;
6. Reclamation or appropriate agency shall ensure the appropriate permit authorizations are secured for stream crossings, and a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog or western pond turtle during construction operations;
7. All trash that could attract predators will be regularly contained and removed from the work site.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.4: Impacts on Birds. Construction of NBWRP Phase 2 has the potential to affect special-status marsh birds, burrowing owl, and other nesting birds in and near the project sites. (Less than Significant with Mitigation)

Potential nesting habitat for numerous common and special-status birds occurs in and adjacent to NBWRP Phase 2 facilities and throughout the project area. Potential nesting sites include large trees, riparian corridors, streamside vegetation, shrubs, open grasslands, levee roads, and under bridges. Project activities, such as site clearing and grubbing, earthmoving, grading, trenching, during the nesting season (generally February 1 to August 31) have the potential to result in direct mortality of bird species. Construction in or adjacent to wetland habitats could impact nesting rails, including the endangered Ridgway's rail and California black rail.

In addition, human disturbances and construction noise have the potential to cause indirect impacts due to nest abandonment and death of young, or loss of reproductive potential at active nests located near project activities. If ground-disturbing activities (i.e., ground clearing, trenching, or grading, including removal or trimming of trees or shrubs), are scheduled to occur outside the nesting season (September 1 through January 31), no mitigation is required. However, if activities would occur from February 1 to August 31, implementing **Mitigation Measure 3.6.4** would reduce potential impacts to a less-than-significant level.

No Project/No Action Alternative

Under the No Project Alternative, no facilities would be constructed as part of NPBWP Phase 2. Therefore, no impacts to nesting birds would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the NBWRP 2 projects as discussed above under Impact 3.6.1 would be pursued in the absence of Title XVI funding. As noted below in the evaluation of the Proposed Action, Disturbance to nesting migratory birds at any of these sites would be a potentially significant impact. Implementation of **Mitigation Measure 3.6.4** would reduce these impacts to a less than significant level.

Proposed Action

All project and staging areas contain suitable habitat for nesting birds protected under the Migratory Bird Treaty Act and the California Fish and Game Code. Potential nesting sites include large trees, riparian corridors, streamside vegetation, shrubs, open grasslands, levee roads, and under bridges. Special-status birds such as San Pablo song sparrow (*Melospiza melodia samuelis*) may occur in tidal marshes in Petaluma and Novato SD. Tricolored blackbird (*Agelais tricolor*) nest in dense colonies in wetland at Sears Point, approximately one mile east of Novato SD project area. Nesting sites for raptors such as white-tailed kite (*Elanus leucurus*) may be present in oak and eucalyptus trees throughout all project areas, and Northern harrier (*Circus cyaneus)* nesting sites may be present in clumps of grasses, willows or reeds. A Swainson's hawk nest was reported within one half-mile of the Soscol WRF in Napa SD. Golden eagle nesting is also reported in the vicinity of American Canyon (CDFW, 2017).

The Novato SD project area contains salt and brackish marsh vegetation that may provide habitat for Ridgway's rail and the California black rail. Habitat for Ridgeway's rail may also be found in the area of the Ellis Creek WRF near Petaluma. However, the turnout to transitional wetlands and pipeline routes are located in existing or future levees, and would not directly impact marsh habitat. Nesting rails could be impacted indirectly by construction noise or the movement of equipment and work personnel.

Potential burrowing owl habitat is located east of the NBWRP Phase 2 pipeline in American Canyon and in agricultural areas of Petaluma and Novato, but no habitat along pipeline routes is likely to support burrowing owls due to sustained vehicle traffic and high levels of human disturbance. The turnout to transitional wetlands in Hamilton wetlands is adjacent to grasslands and agricultural fields that provide burrowing owl habitat (Jones & Strokes 2003).

Disturbance to nesting raptors, burrowing owls, special-status rails or other nesting birds, would be a potentially significant impact. Implementation of **Mitigation Measure 3.6.4** would reduce these impacts to a less than significant level.

Program Elements

The Program Elements would provide additional capacity in the Novato SD, Napa SD, SCWA, and City of American Canyon service areas. Disturbance to nesting migratory birds at any of these sites would be a potentially significant impact. Implementation of **Mitigation Measure 3.6.4** would reduce these impacts to a less than significant level.

Storage Alternative

The Storage Alternative includes additional storage, treatment and distribution facilities to provide operational flexibility within the following member agency service areas: Novato SD, Napa SD, Petaluma Ellis Creek WRF, and SVCSD. Disturbance to nesting migratory birds at any of these sites would be a potentially significant impact. Implementation of **Mitigation Measure 3.6.4** would reduce these impacts to a less than significant level.

Mitigation Measures

Mitigation Measure 3.6.4: Impacts to Nesting Birds. The appropriate Member Agency shall implement the following protection elements to avoid disturbing common and special-status nesting birds:

1. Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31).
2. For ground-disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. Construction activities will be constrained to the smallest area possible to minimize disturbance to potential nesting habitat.
3. For work in Ridgway's rail, California black rail, western snowy plover or western burrowing owl habitat, a Service-approved biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the bird species and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action.
4. All work areas, including staging areas will be surveyed prior to construction for bird nests during nesting season. If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. For non-special status migratory birds, buffer size will be determined in consultation with CDFW. Buffer zones may be modified in coordination with CDFW based on existing conditions at work locations.

   If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.
5. For work in locations that provide habitat for listed marsh birds including Ridgway's rail, and special-status birds such as burrowing owl and black rail, protocol-level surveys will be conducted to determine species presence or absence.
6. If occupied burrowing owl burrows are discovered, construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the non-breeding season (September 1 through January 31), the exclusion zone would extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250 feet around occupied burrows. Passive relocation of owls is not proposed. A qualified biologist will monitor owl activity on the site to ensure the species is not adversely affected by the project.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.5: Impacts to Mammals. Construction of NBWRP Phase 2 has the potential to affect special-status mammals, including salt marsh harvest mouse, and roosting or breeding bats in and near the project alignments. (Less than Significant with Mitigation)

Impacts to terrestrial mammals may include the temporary removal of vegetation, direct mortality from equipment, entrapment in pipe sections or trenches, and harassment due to noise or vibration.

Bridges and large trees throughout the project area provide potential habitat for roosting and breeding bats. Potential direct impacts to special-status bats include removal of roost sites during site clearing and grubbing activities. Indirect impacts include increased noise and human presence during construction, with the possibility of temporary nest or roost abandonment.

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NBRWP Phase 2. Therefore, no impacts to special status mammals would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the Phase 2 Program projects as discussed above under Impact 3.6.1 would be pursued in the absence of Title XVI funding. As noted below in the evaluation of the Proposed Action, the project has the potential to impact special-status bats in all recycled water service areas, and potential to impact salt marsh harvest mouse and Suisun ornate shrew at the Novato SD sites. Impacts to bats and other special-status mammal species would be potentially significant. Implementation of **Mitigation Measure 3.6.5** would reduce potential impacts on special-status mammals to a less-than-significant level.

Proposed Action

Habitat for the endangered salt marsh harvest mouse and the special-status Suisun ornate shrew is present in the tidal marshes of the Novato SD, but the NBWRP Phase 2 pipelines will be built within a levee and is unlikely to impact habitat for this species. The turnout to transitional wetlands construction will similarly occur on a levee within disturbed habitat, adjacent to tidal marsh. No other project areas contain habitat for salt marsh harvest mouse or Suisun ornate shrew.

American badger may be found in dry, ruderal grasslands and grazing areas, but are typically found in more open habitat than is available in the vicinity of the project areas. This species would not be impacted by the project.

Pallid bat and other bat species may roost under bridge crossings over Lynch Creek, Arroyo Seco, North Slough, and other drainages that provide a reliable nearby water source. Large trees may also provide night roost habitat for bat species. The project has the potential to impact special-status bats in all recycled water service areas. Impacts to bats and other special-status mammal species would be potentially significant. Implementation of **Mitigation Measure 3.6.5** would reduce potential impacts on special-status mammals to a less-than-significant level.

Program Elements

The Program Elements would provide additional capacity in the Novato SD, Napa SD, SCWA, and City of American Canyon service areas. The Novato SD Lower Novato Creek restoration project would impact tidal marsh providing habitat for special status mammals. The project has the potential to impact special-status bats in all recycled water service areas, and potential to impact salt marsh harvest mouse and Suisun ornate shrew at the Novato SD sites. Impacts to bats and other special-status mammal species would be potentially significant. Implementation of **Mitigation Measure 3.6.5** would reduce potential impacts on special-status mammals to a less-than-significant level.

Storage Alternative

The Storage Alternative includes additional storage, treatment and distribution facilities to provide operational flexibility within the following member agency service areas: Novato SD, Napa SD, Petaluma Ellis Creek WRF, and SVCSD. The Novato SD restoration site may provide habitat for special status mammals. Impacts to protected bats and other special status mammal species near these facilities would be potentially significant. Implementation of **Mitigation Measure 3.6.5** would reduce potential impacts on special-status mammals to a less-than-significant level.

Mitigation Measures

Mitigation Measure 3.6.5: Impacts to Mammals.

1. The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on salt marsh harvest mouse during construction. Where avoidance of sensitive habitat (i.e., areas in or near pickleweed) is not feasible (e.g., by bridging or bore and jack), consultation with the USFWS would be initiated. If salt marsh harvest mouse is present or presumed to be present in the project area following informal coordination with USFWS, then formal consultation and a Biological Assessment in support of a Biological Opinion may be needed. Such a consultation would proceed as part of the Corps 404 permitting process. Similar coordination and permitting shall be performed with CDFW to address potential impacts to salt marsh harvest mouse. Staging areas shall be located outside potential salt marsh harvest mouse habitat.
2. To avoid potential impacts on salt marsh harvest mouse and Suisun ornate shrew, a qualified biologist shall conduct specific preconstruction surveys to delineate potential habitat in the project area. For areas within 100 feet of potential habitat, the project proponent shall install exclusionary fences to prevent species movement into the project area, and to prevent spoils from entering the salt marsh. Fencing will consist of a material that does not allow small mammals to pass through or over, and the bottom will be buried to a depth of at least six inches.

3. A qualified biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the species and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action.
4. Once a Biological Opinion is issued for the work, a qualified biologist will direct crews in the hand removal of pickleweed and remain on-site to provide biological monitoring during construction. The biological monitor shall inspect the exclusion fence to ensure their integrity, and shall conduct an education workshop for contractors outlining species' biology, legislative protection, and construction restrictions to reduce potential impacts. Protective measures for the salt marsh harvest mouse will equally protect the Suisun ornate shrew.
5. At the close of each workday, escape ramps/boards will be provided in all open trenches. Every morning prior to the start of construction, a qualified biologist will inspect all open trenches within 250 feet of emergent pickleweed (Salicornia pacifica) habitat for trapped mice. In the event a salt marsh harvest mouse or Suisun ornate shrew is found on-site, with approval from the Service, the biologist will remove animals from trenches before the start of construction.
6. A Service-approved biologist will be onsite during all ground-disturbing activities, including vegetation removal and during morning trench inspections, and otherwise available during the course of the construction work. The biologist will be responsible for informing the crews of the need to halt work if sensitive species are observed, and documenting compliance with the conservation measures and contacting the USFWS if any sensitive species are observed.
7. The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on special-status bats in and near project facilities during construction.
8. In conjunction with breeding bird surveys (**Mitigation Measure 3.6.4**), a qualified biologist will conduct preconstruction surveys for special-status bats at each bridge crossing location and in rural (i.e., non-road) areas where any large trees (e.g., > 24 inch diameter at breast height) will be removed. If an active roost is observed, a suitably-sized buffer (e.g., 100 to 150 feet) will be placed around the roost if it appears that trenching or other project activities may cause abandonment. Demolition activities must cease until juvenile bats are self-sufficient and will not be directly or indirectly impacted by activities.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.6: Impacts to Rare Plants. Project construction could result in impacts to listed and other special-status plants. (Less than Significant with Mitigation)

The following listed and special-status plants have been identified as having at least a moderate potential to occur in or near the project area: Sonoma sunshine, Franciscan onion, Napa false indigo, big-scale balsamroot, narrow-anthered brodiaea, Point Reyes bird's-beak, congested-headed hayfield tarplant, and saline clover (see **Appendix 3.6B**).

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NPBWP Phase 2. Therefore, no impacts to listed or other special status plants would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the Phase 2 Program projects discussed above under Impact 3.6.1 would be pursued in the absence of Title XVI funding. As noted below in the evaluation of the Proposed Action, impacts to rare plants from construction at these sites would be potentially significant. Implementation of **Mitigation Measure 3.6.6** would reduce these impacts to a less than significant level.

Proposed Action

Point Reyes bird's-beak and Napa false indigo have been recorded in the vicinity of the MMWD site, but Napa false indigo is likely extirpated and Point Reyes birds-beak occurs in coastal salt marsh. Thus, implementation of the proposed project would not impact either species due to lack of suitable habitat. The MMWD alignment crosses a roadway, roadside ruderal grassland, and ornamental vegetation. The Petaluma sites have the potential to support Franciscan onion, Napa false indigo, and congested-headed hayfield tarplant, which occur in grassland or in woodland openings, and Point Reyes bird's-beak, in salt marsh. The Novato SD sites have potential to support congested-headed hayfield tarplant in grassland areas. The Napa SD Soscol WRF has potential to support saline clover and narrow-anthered brodiaea in moist grassland areas. Saline clover also may potentially be found in moist grassland along the American Canyon alignment routes.

Sonoma sunshine has been recorded in moist grassland habitat north of the SVCSD Napa Road alignment. Because the alignment will be in the roadway, impacts to this species are not expected. This site also has potential to support saline clover, congested-headed hayfield tarplant, and narrow-anthered brodiaea. These species are unlikely to be encountered, but may occur in roadside grasslands near crossing sites. Impacts to rare plants from construction or staging would be potentially significant. Implementation

of **Mitigation Measure 3.6.6,** which includes completion of appropriately timed sensitive plant surveys, would reduce these impacts to a less than significant level.

Program Elements

The Program Elements would provide additional capacity in the Novato SD, Napa SD, SCWA, and City of American Canyon service areas. In addition to the potential habitat described for the Proposed Project, grassland at the periphery of the SCWA sites has the potential to support Franciscan onion, Napa false indigo, and narrow-anthered brodiaea.

Impacts to rare plants from construction would be potentially significant. Implementation of **Mitigation Measure 3.6.6** would reduce these impacts to a less than significant level.

Storage Alternative

The Storage Alternative includes additional storage, treatment and distribution facilities to provide operational flexibility within the following member agency service areas: Novato SD, Napa SD, Petaluma Ellis Creek WRF, and SVCSD. The storage facility in Napa may be built on a seasonal wetland site with potential habitat for Sonoma sunshine. The Novato SD restoration work may impact tidal marsh plants. Impacts to rare plants from construction at these sites would be potentially significant. Implementation of **Mitigation Measure 3.6.6** would reduce these impacts to a less than significant level.

Mitigation Measures

Mitigation Measure 3.6.6. Impacts to Rare Plants. Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented:

1. A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Appendix 3.6C, in all suitable habitat that would be potentially disturbed by the project, including staging areas.
2. Surveys shall be conducted following the most recent CDFW- or other approved protocol.
3. If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required.
4. If special-status plants are found during focused surveys, the following measures shall be implemented:
    a. Information regarding the special-status plant population shall be reported to the CNDDB.
    b. If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat.
    c. If special-status plant populations cannot be avoided, consultations with CDFW and/or USFWS would be required. A plan to compensate for the loss of special-status plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be developed in consultation with the appropriate agencies prior to the start of local construction activities.
    d. If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.

Impact Significance after Mitigation: Less than Significant.

Impact 3.6.7: Impacts on Heritage and Other Significant Trees. The proposed project could affect heritage and other significant trees. (Less than Significant with Mitigation)

No Project/No Action Alternative

Under the No Project Alternative, no facilities, would be constructed as part of NPBWP Phase 2. Therefore, no impacts to heritage or other significant trees would occur.

Under the No Action Alternative, which includes consideration of future conditions, it is likely that four of the Phase 2 Program projects discussed above under Impact 3.6.1 would be pursued in the absence of Title XVI funding. As noted below in the

evaluation of the Proposed Action. No trees have been identified for removal at these sites. However, tree species including valley oak, coast live oak, California bay, blue oak, madrone, eucalyptus, sycamore, cypress, willow, and other species occur near roads and in adjacent off-road areas proposed for pipeline construction and in the vicinity of program components. At some sites, trees will need to be trimmed or removed, some of which may be considered significant to the counties of Sonoma or Napa. Implementation of **Mitigation Measure 3.6.7** will reduce potential impacts to a less-than-significant level.

Proposed Action

No trees have been identified for removal as a result of the proposed projects. However, tree species including valley oak, coast live oak, California bay, blue oak, madrone, eucalyptus, sycamore, cypress, willow, and other species occur near roads and in adjacent off-road areas proposed for pipeline construction and in the vicinity of project components. At some sites, trees may need to be trimmed or removed, some of which may be considered significant to the counties of Marin, Sonoma or Napa. Staging areas will avoid removal of trees. Implementation of **Mitigation Measure 3.6.7** will reduce potential impacts to a less-than-significant level.

Program Elements

The Program Elements would provide additional capacity in the Novato SD, Napa SD, SCWA, and City of American Canyon service areas. No trees have been identified for removal with programmatic actions. However, tree species including valley oak, coast live oak, California bay, blue oak, madrone, eucalyptus, sycamore, cypress, willow, and other species occur near roads and in adjacent off-road areas proposed for pipeline construction and in the vicinity of program components. At some sites, trees may need to be trimmed or removed, some of which may be considered significant to the counties of Sonoma or Napa. Implementation of **Mitigation Measure 3.6.7** will reduce potential impacts to a less-than-significant level.

Storage Alternative

No trees have been identified for removal under the Storage Alternative. However, tree species including valley oak, coast live oak, California bay, blue oak, madrone, eucalyptus, sycamore, cypress, willow, and other species occur near roads and in adjacent off-road areas proposed for pipeline construction and in the vicinity of project components. At some sites, trees will need to be trimmed or removed, some of which may be considered significant to the counties of Sonoma or Napa. Implementation of **Mitigation Measure 3.6.7** will reduce potential impacts to a less-than-significant level.

Mitigation Measures

Mitigation Measure 3.6.7: The following measures will be implemented to avoid or reduce impacts to heritage or other significant trees:

1. If trees are identified for removal or trimming, a certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height), and number of protected trees. Also, in consultation with the appropriate County, the arborist will determine if any are heritage or landmark trees.
2. If any protected trees are identified that will be potentially removed or damaged by construction of the proposed project, design changes will be implemented where feasible to avoid the impact.
3. Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances (see **Appendix 3.6A**). Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.

Impact Significance after Mitigation: Less than Significant.

3.6.3.3 Impact Summary by Service Area

Appendix 3.6B provides a summary of potential Project impacts per Member Agency related to biological resources.

3.7 Land Use and Agricultural Resources

This section describes the affected environment, regulatory framework, and effects related to land use and agriculture resources. Section 3.7.1, *Affected Environment* describes existing land uses and agricultural resources in the project area. Section 3.7.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.7A. No comments or other input regarding land use or agricultural resources were received during the scoping period for this EIR/EIS.

3.7.1 Affected Environment

3.7.1.1 General Setting

Marin, Sonoma, and Napa Counties are located in the north San Francisco Bay Area, California. This area has a diverse and unique physical setting, including mountain ridges, hills, and valleys, which are replete with forests, oak woodlands, stream corridors, agricultural lands, and tidal and fresh water marshes.

Land uses in the approximately 320-square-mile NBWRP Phase 2 area include urban residential and commercial developments, industrial development, low density rural communities, agriculture and viticulture, grazing land, and open space. Currently, nearly half of the land in this region consists of open space, parks, and rural, agricultural and grazing lands. The most intensive farming occurs in Napa and Sonoma counties. Only a small percentage of land has been developed, primarily along the transportation corridor and within associated cities.

3.7.1.2 Local Setting

This section presents a brief description of the land use patterns in each of the Member Agency service areas, organized by county. Figures 2-1 through 2-27 in Appendix A provide a view of land use patterns in the area. It should be noted that the land use designations used in these descriptions are consistent with those used in each jurisdiction's planning documentation.

Marin County

Marin County's total land and water area is approximately 606 square miles, of which about 87 percent (527 square miles) is unincorporated. Marin County is one of the nine counties that comprise the San Francisco Bay Area. It is linked to San Francisco by the Golden Gate Bridge and to the East Bay via the Richmond-San Rafael Bridge.

The NBWRP Phase 2 area in Marin County includes the unincorporated community of San Quentin, which is located to the east of San Quentin State Prison and encompasses a portion of the Bayfront Conservation Zone as identified by the Marin Countywide Plan. The project area is within and to the west of the San Quentin Prison Public Facility area and the pipeline would run within East Sir Francis Drake Boulevard to the CMSA treatment facility (Marin County, 2007). These areas are primarily within public facility grounds (i.e., prison grounds) or along roadways. Unincorporated areas near Novato which would be affected by NBWRP Phase 2 activities include residential and agricultural uses (Marin County, 2007).

Novato SD

Formed in 1925, the Novato Sanitary District (SD) includes about 34 square miles in northern Marin County, with the bulk of it being the incorporated City of Novato, which covers about 28 square miles. In contrast to nearby cities, the Novato area's population density is low, one-half that of San Rafael and less than one-third that of Petaluma. This low density and the city's large parks and open space create a rural character (City of Novato, 1996). Public facility, residential, commercial, light industrial, and open space uses are adjacent to the Project area where pipelines would be installed.

The Novato SD Recycled Water Facility (RWF) is classified as "public lands" by the planning agency (City of Novato). Potentially affected areas along Lower Novato Creek are classified as "public facility" and "open space" uses.

MMWD

City of San Rafael. The portion of the project within the CMSA treatment facility and a portion of the pipeline connecting to the San Quentin Prison, would be located in the City of San Rafael within Marin County. Incorporated in 1874 and later as a charter city in 1913, the City of San Rafael is the county seat for Marin County and has the largest population in the county. The city covers 22 square miles, five of which are water and tidelands. San Rafael has set aside 3,285 acres of open space within the city limits and almost 7,300 acres in its planning area. The existing land uses in the small portion of San Rafael within the NBWRP Phase 2 area are open space and public areas (City of San Rafael, 2013).

Sonoma County

Sonoma County covers approximately 1,500 square miles and spans a diverse mosaic of landforms, environments, and human settlements (Sonoma County, 2008). Areas of the county within the NBWRA Phase 2 area include the Sonoma Valley, including the City of Sonoma, and areas within and south of the City of Petaluma.

The Mayacamas Range forms the eastern physical boundary of the county. Along with Sonoma Mountain, it encloses the Sonoma Valley or "Valley of the Moon," a scenic agricultural valley which extends from near Santa Rosa southeastward to the City of Sonoma and the marshlands of San Pablo Bay. The 140,000 residents in unincorporated areas are concentrated in urban areas located just outside several cities, notably Santa Rosa and Sonoma, and in a number of rural unincorporated communities. Within the NBWRP Phase 2 area, land uses include urban mixed residential in the city and unincorporated areas to the north and rural/agricultural to the south and east.

Highway 101 is the major north/south route in the coastal region of Northern California. Within the NBWRP Phase 2 area, it essentially parallels the Petaluma River from the Marin County line north to the City of Petaluma. In this area, land uses include agricultural and public/quasi-public land uses in the rural area to the south of the city, then corporate park and urban single-family uses in the eastern portion of the city.

SVCSD/SCWA

City of Sonoma. Totaling approximately 1,717 acres, the City of Sonoma is mostly built-out comprised of a mix of residential, commercial, agricultural, and wine production uses. In Sonoma, open space is composed of agricultural land, hillsides, creeks, riparian corridors, parks, and small pockets of land with less intensive uses, including small vineyard, garden, grazing, and horse pasture areas. Hills and adjacent agricultural lands in Sonoma County provide a natural greenbelt for the City of Sonoma (City of Sonoma, 2006). The NBWRP Phase 2 area is primarily located within existing roads adjacent to public facility and park/open space uses.

Petaluma

City of Petaluma. Incorporated in 1858, the City of Petaluma comprises approximately 9,911 acres in its urban growth boundary. Petaluma's existing land use distribution is dominated by residential land uses, with commercial uses along major corridors, and light industrial uses clustered in business parks at the northern and southern edges of Petaluma, adjacent to Highway 101. Open space, including a County park, constitutes a significant portion of the Petaluma's acreage. Thirty percent of this open space, however, is comprised of privately-held and/or operated recreation facilities such as golf courses (City of Petaluma, 2008). The NBWRP Phase 2 area is primarily located within existing roads adjacent to residential, education, mixed use, business park, public, park, and open space uses.

Napa County

Napa SD

County of Napa. Regional land use patterns in Napa County consist of dense urban centers associated with cities along Highways 12, 29, 121, 128, and 221, open space, natural resources, and agricultural activities with vineyard development as one of the most prominent activities (Napa County, 2008). The majority of Napa County comprises unincorporated land.

The NBWRP Phase 2 components located within unincorporated Napa County would be located within existing roadways in an industrial area adjacent to the Napa County Airport, within the bounds of the Soscol Water Recycling Facility (WRF) located on public-institutional, and within public-institutional lands adjacent to the Napa State Hospital (Napa County, 2008).

American Canyon

City of American Canyon. The City of American Canyon is located in a transitional area between the Sulphur Springs Mountains and the Napa River. Highway 29 bisects the City of American Canyon. The NBWRP Phase 2 components within the city would largely be located in existing roadways adjacent to single family residential and commercial uses to the south, and industrial uses to the north (City of American Canyon, 1994).

3.7.1.3 Agricultural Setting

Agricultural land uses constitute much of the project area. Categories of agricultural land uses include irrigated farmland, dry farm property, dairy and pasture, vineyard, and orchard. "Irrigated farmland" includes rice and field, vegetable, nursery, and berry crops. "Dairy and Pasture" consists of dairies, dairies with residences, and grazing areas. The "orchard" category groups deciduous fruits and nuts, citrus, and subtropical trees. The primary agricultural land uses in the southern Sonoma, Napa, and Petaluma Valleys are vineyards and hay fields. Napa and Sonoma Valleys contain vast areas of vineyards, and new technologies are allowing grapes to be grown on steeper slopes, cooler and/or drier climates, and poorer soils, as wine grape production is expected to continue to expand. In the diked baylands, agricultural production is limited due to the high salinity of the soil and limited water supply. Therefore, oat hay

is one of the only practical crops that can be grown in these areas. The dairy industry and cattle grazing still have a strong presence. However, grazing acreage has dropped significantly, as housing and vineyard development have replaced grazing land in many areas. Other agricultural uses in the watershed include timber, olives, vegetable crops, Christmas trees, small scale poultry farming, greenhouses, and floral nurseries (USACE, 2010).

Important Farmland in the Project Area

As described in the Regulatory Framework discussion in **Appendix 3.7B**, the California Farmland Mapping and Monitoring Program classifies important farmlands into five categories based on their suitability for agriculture: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance and Grazing Land. Further information relative to each project facility, including the type and number of acres of agricultural land affected.

Farmland Conversion

Table 3.7-1 provides a summary of recent changes to agricultural land within the project area, in Napa County, Sonoma County and Marin County respectively. All three counties experienced a net loss of agricultural land between 2014 and 2016. However, there was a net increase in the amount of Unique Farmland and Farmland of Local Importance. In all three counties, the most significant net losses were in Grazing Land.

TABLE 3.7-1: RECENT FARMLAND CONVERSIONS IN NAPA, SONOMA AND MARIN COUNTIES

	Total Acres Inventoried		2014–2016 Acreage Changes		
Land Use Category	**2014**	**2016**	**Acres Lost**	**Acres Gained**	**Net Change**
Prime Farmland	61,262	60,554	1,269	561	-708
Farmland of Statewide Importance	27,107	26,918	485	296	-189
Unique Farmland	49,809	49,990	977	1,158	+181
Farmland of Local Importance	162,781	162,936	1,053	1,208	+155
Grazing Land	685,348	684,084	1,656	392	-1,264
Agricultural Land Subtotal	986,307	984,482	**3,784**	**3,223**	**-1,825**

SOURCE: CDC, 2016a, 2016b, 2016c.

3.7.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Land Use and Agricultural Resources issues and used to determine the significant criteria present in **Section 3.7.1** is found in **Appendix 3.7A**.

3.7.3 Direct and Indirect Effects

3.7.3.1 Significance Criteria under CEQA

Based on **Appendix G** of the CEQA Guidelines, NBWRP Phase 2 or an alternative would result in a significant impact on land use if it would:

1. Physically divide an established community;
2. Conflict with any applicable land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating a significant environmental effect; or
3. Conflict with any applicable habitat conservation plan or natural community conservation plan.

As the standard for determining whether NBWRP Phase 2 alternatives would conflict with a general plan policy, this EIR/EIS relies on the following guidance provided in the *General Plan Guidelines*, published by the Office of Planning and Research (OPR): "An action, program, or project is consistent with the general plan if, considering all its aspects, it will further the objectives and policies of the general plan and not obstruct their attainment" (OPR 2003).

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 alternatives would result in a significant impact on agricultural or forestry resources if it would:

1. Directly or indirectly convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation, to a non-agricultural use;[1]
2. Conflict with existing zoning for agricultural use, or a Williamson Act contract; or
3. Involve other changes in the existing environment which, due to their location or nature, could result in the conversion of Farmland to non-agricultural use.

3.7.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.7.1: Implementation of NBWRP Phase 2 would not physically divide an established community. (No Impact)

No Project/No Action Alternative

The No Project Alternative would not conflict with any land use plans, therefore **no impact** would occur.

Under the No Action Alternative, only the Urban Recycled Water Expansion project would be constructed in an established neighborhood. While construction of this project would temporarily disrupt day-to-day movements in these neighborhoods, it would not have a lasting effect on community cohesion after construction is complete. Therefore, **no impact** would occur.

Proposed Action

The NBWRP Phase 2 would include components that are constructed within developed areas. Treatment upgrades and the siting of storage reservoirs or tanks would occur primarily within existing Wastewater Treatment Plant (WWTP) sites. Proposed pipelines would be installed below the ground surface and not within view. The footprint of proposed pump stations would not be large enough to physically divide an established community. NBWRP Phase 2 therefore, would not physically divide a community. **No impact** is expected. **Table 3.7.-2** summarizes the impact finding for each element of the Proposed Action.

Novato SD. NBWRP Phase 2 would include facility upgrades at the existing Novato SD RWF including the installation of a chlorine contact tank and tertiary filters with associated on-site piping. The upgrades would occur within the existing WWTP boundaries and project-related construction will be localized to RWF site and would not physically divide an existing community, and **no impact** would occur.

NBWRP Phase 2 would also include approximately 5,780 linear feet of distribution pipelines along Olive Avenue, Lea Drive, Davidson Street, Louis Drive, Franklin Avenue, Rowland Way, and Vintage Way. The pipelines would be constructed along existing roadways or rights-of-way adjacent to public facility, residential, commercial, light industrial, and open space uses by the North Marin Water District (NMWD). These facilities would not physically divide an established community. Construction and installation of pipeline, for any option, would be beneath the ground surface and within existing easements and roadways where feasible and would not physically divide an established community, and **no impact** would occur.

[1] Based on the definition of agricultural use contained in the Williamson Act, conversion to "non-agricultural use" would mean that land previously used for producing an agricultural commodity for commercial purposes is no longer capable of serving this purpose.

TABLE 3.7-2: PROPOSED ACTION EFFECTS TO ESTABLISHED COMMUNITIES

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	These NBWRP Phase 2 components would be constructed and operated within the confines of existing treatment facilities. They would not be located within and divide existing communities. Therefore, there would be **no impact**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD	
Pipeline Projects		
Marin County Lower Novato Creek	Marin Co.	These pipeline components would be in rural or undeveloped areas. Therefore, there would be **no impact** to established communities.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	
MMWD San Quentin Pipeline	MMWD	Construction of pipeline components in streets would have the potential to temporarily disrupt neighborhoods. However, upon completion of construction, these pipelines would be buried and would not be a permanent barrier. Therefore, there would be **no impact** to established communities.
Petaluma Urban Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	These components would be located in a wetland restoration area with no established community. Therefore, there would be **no impact**.
Napa SD Soscol Covered Storage	Napa SD	These component would be located within the confines of existing treatment facilities that is not located within an established community. Therefore, there would be **no impact**.
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	This pipeline component would be in a rural, sparsely developed area. Therefore, there would be **no impact** to established communities.
Napa SD Napa State Hospital Pipeline	Napa SD	This component would be located in a public health services facility. While construction of the pipeline would temporarily disrupt pedestrian and vehicular circulation on the facility, it would not permanently divide the facility. Therefore, there would be **no impact**.
SCWA Potable Water ASR - Sonoma	SCWA	This component would be located on a public utility site that is fenced to prevent general public access. Therefore, there would be **no impact** to an established community.
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	These NBWRP Phase 2 components would be in rural or undeveloped areas. Therefore, there would be **no impact** to established communities.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	
SCWA Potable Water ASR - Valley of the Moon	SCWA	Construction of pipeline components in streets would have the potential to temporarily disrupt neighborhoods. However, upon completion of construction, these pipelines would be buried and would not be a permanent barrier. Therefore, there would be **no impact** to established communities.
SCWA Potable Water ASR - Sonoma	SCWA	

NBWRP Phase 2 would also provide recycled water to an environmental enhancement project with the construction of a hydraulic structure to connect to an existing outfall pipeline, a flow splitting structure to divert flow, and approximately 100 linear feet of pipeline. The enhancements and associated infrastructure would be located within public facility lands and open space, and would not physically divide an established community. Therefore, **no impact** would occur.

SVCSD. NBWRP Phase 2 would expand the recycled water service area in the unincorporated areas of Sonoma County east of the City of Sonoma along Napa Road. The pipeline would be located within the roadway or roadway shoulder and would connect to existing pipelines and extend eastward. The buried recycled water pipeline extensions would be constructed within existing public roadways adjacent to rural residential and agricultural land uses. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

MMWD. NBWRP Phase 2 would include upgrades at the existing CMSA facility and the site retrofits at San Quentin and a conveyance pipeline within Sir Francis Drake Boulevard from the treatment facility to the prison grounds. The existing land uses in San Rafael in the NBWRP Phase 2 area are open space and public areas. The pipeline would be buried and extend through existing roadways to San Quentin State Prison. Improvements to the CMSA treatment facility would occur within the facility; likewise, the remaining above-ground components would be located within the confines of the prison. Therefore, the improvements and associated infrastructure would not physically divide an established community, and **no impact** would occur.

Napa SDs. NBWRP Phase 2 would increase the Soscol WRF tertiary treatment capacity and construct an operational storage pond, and would occur within the bounds of the WRF. The NBWRP Phase 2 area is located within the bounds of the Soscol WRF located on public-institutional lands in unincorporated Napa County. The NBWRP Phase 2 area is located within public-institutional lands adjacent to the Napa State Hospital. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

Petaluma. NBWRP Phase 2 would include upgrades at the existing Ellis Creek WRF to increase its tertiary filtration and disinfection capacity. The project site is located within the already disturbed area at the existing Ellis Creek WRF facility and would require minimal construction in undisturbed areas. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

NBWRP Phase 2 would also include an extension of a pipeline from an existing pipeline near Ellis Creek WRF to serve the Oakmead Business Park. The proposed pipeline alignments would be along existing roadways within the City of Petaluma's right-of-way adjacent to residential, education, mixed use, business park, public, park, and open space land uses. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

Additionally, NBWRP Phase 2 includes the extension of recycled water pipelines from the Ellis Creek WRF eastward to serve agricultural customers along Lakeville Highway. The proposed pipeline alignments would be along roads in the public right-of-way, within already disturbed areas. The number of creek crossings would be minimized and green ways would be avoided to minimize construction in undisturbed areas. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

NBWRP Phase 2 includes additional program elements involving the extension of recycled water pipelines to serve agricultural customers along Lakeville Highway. The proposed pipeline alignments would be along roads in the public right-of-way, within already disturbed areas. The number of creek crossings would be minimized and green ways would be avoided to minimize construction in undisturbed areas. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

American Canyon. NBWRP Phase 2 would involve a number of pipeline extensions from its existing system to deliver recycled water to existing landscaping and industrial users currently on potable water and convert them to recycled water for non–potable uses. The recycled water pipeline extensions would be constructed within existing public roadways adjacent to single family residential, commercial, and industrial uses. Therefore, NBWRP Phase 2 would not physically divide an established community, and **no impact** would occur.

Program Elements

NBWRP Phase 2 would include construction of a new seasonal tertiary recycled water storage pond at a site near Highway 37, and five other program elements providing recycled water to an environmental enhancement project, similar as described above in the Novato SD discussion under the Proposed Action. The enhancements and associated infrastructure would be located within public facility lands and open space, and would not physically divide an established community.

NBWRP Phase 2 includes two program elements involving Aquifer Storage and Recovery (ASR). NBWRP Phase 2 would construct a new ASR well, including two new monitoring wells, to allow for injection/extraction operations to store and recover injected potable water as well as a new pipeline and pump station to convey water from the ASR, located near an existing Water Agency potable water pipeline in El Verano. The NBWRP Phase 2 area is primarily located within existing roads adjacent to public/quasi-public and urban residential uses. Therefore, this NBWRP Phase 2 Program component would not physically divide an established community.

NBWRP Phase 2 would similarly construct a new Sonoma ASR well and two new monitoring wells – along with the conversion of an existing groundwater well to a third monitoring well – to allow for injection/extraction operations to store and recover injected potable water. New pipeline would also be constructed to convey water from the existing Water Agency potable water distribution system to the Sonoma ASR. The NBWRP Phase 2 area is primarily located within existing roads adjacent to public facility and park/open space uses. Therefore, this NBWRP Phase 2 component would not physically divide an established community.

The NBWRP Phase 2 would include a new operational storage tank for the Napa State Hospital and pipeline to connect the tank to the existing recycled water distribution system. The storage tank would be on a hillside, and the pipeline would be located underground. Therefore, this NBWRP Phase 2 component would not physically divide an established community.

The recycled water pipeline extensions under the program elements in American Canyon would be constructed within existing public roadways adjacent to single family residential, commercial, and industrial uses. Therefore, this NBWRP Phase 2 component would not physically divide an established community, and **no impact** would occur.

Storage Alternative

With the exception of the Napa SD MST Northern and Eastern Loop, Storage Alternative components would either be constructed within existing facilities or in rural undeveloped areas and as such would not divide an existing community. Although construction of the MST pipeline components in residential streets would have the potential to temporarily disrupt neighborhoods, upon completion of construction, these pipelines would be buried and would not be a barrier. Therefore, there would be **no impact** to established communities for the Storage Alternative components.

Mitigation Measures

None required.

Impact Significance: No Impact.

Impact 3.7.2: Implementation of NBWRP Phase 2 would not conflict with applicable land use plans adopted for the purpose of avoiding or mitigating a significant environmental effect. (Less than Significant)

Environmental impacts of NBWRP Phase 2 are evaluated throughout this EIR/EIS. Applicable land use plans of all subject jurisdictions have been reviewed and included in the development of significance criteria applied to each resource area.

State law and judicial interpretation of state law mutually exempt public utilities and special-purpose local agencies (such as water and wastewater districts) from complying with local building and zoning ordinances when locating or constructing facilities for the production, generation, storage, treatment, or transmission of water and wastewater (California Government Code Section 53090 et seq.). No local agency approvals would be needed for adoption of the program elements of the project, although in circumstances, encroachment permits may be required for NBWRP Phase 2 activities in public right-of-way.

In light of these considerations, the consistency evaluation below provides an evaluation to advise the decision-makers as to whether NBWRP Phase 2 is consistent with applicable land use plans and policies.

No Project/No Action Alternative

The No Project Alternative would not conflict with any land use plans, therefore **no impact** would occur.

The projects under the No Action Alternative, would not conflict with local land use planning guidance and controls relative to protecting environmental resources. Therefore, there would be **no impact** related to consistency with land use plans.

Proposed Action

Collectively, NBWRP Phase 2 would provide 4,884 acre-feet (AF) of new recycled water for beneficial use and would include: installation of 19.8 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 4.87 million gallons per day (mgd) of tertiary treatment capacity, and development of approximately 10.1 acre-feet of storage, primarily for agricultural use. A discussion of Member Agencies is provided below.

Novato SD, SVCSD, SCWA, MMWD, Napa SD, Petaluma American Canyon. The project facilities proposed under NBWRP Phase 2 – whether funded by Title XVI or not (i.e., Program Elements) – would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. NBWRP Phase 2 includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Construction of some of these facilities would result in impacts on air quality and natural resources and could conflict with those specific plans and policies, appropriate and practicable mitigation measures have been presented to address the potential conflicts. On the whole, NBWRP Phase 2 would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

The significance criteria used in this document align with the intent of the general plans' goals and policies related to protecting the environment. As detailed throughout the other sections of Chapter 3, most of the environmental impacts attributable to NBWRP Phase 2 would be associated with construction, and the impacts would be reduced to less-than-significant levels, either through measures proposed as part of the program or otherwise committed to by the NBWRA and its Member Agencies. NBWRP Phase 2 would, on the whole, be consistent with all applicable General Plans and other land use plans in the area. NBWRP Phase 2 would further the objectives and policies of these plans and not obstruct their attainment by providing recycled water for agricultural, urban, and environmental uses, thereby reducing reliance on local and imported surface and groundwater, reducing

the amount of treated effluent releases to San Pablo Bay and its tributaries, as well as to promote other conjunctive use strategies to improve water supply reliability. Therefore, there would be **no impact** related to consistency with land use plans.

Program Elements

The Program Elements would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. Like NBWRP Phase 2, these elements include facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Construction of some of these facilities would result in impacts on air quality and natural resources and could conflict with those specific plans and policies, appropriate and practicable mitigation measures have been presented to address the potential conflicts. On the whole the Program Elements would also provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region. Therefore, there would be **no impact** related to consistency with land use plans.

Storage Alternative

The project facilities proposed under the Storage Alternative, which include the Proposed Action, would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation and agriculture. Like NBWRP Phase 2, the Storage Alternative includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Construction of some of these facilities would result in impacts on air quality and natural resources and could conflict with those specific plans and policies, appropriate and practicable mitigation measures have been presented to address the potential conflicts. On the whole the Storage Alternative would also provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region. Therefore, there would be **no impact** related to consistency with land use plans.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.7.3: Impact to Farmland. NBWRP Phase 2 could affect the agricultural use of important farmland. (Less than Significant)

Some NBWRP Phase 2 alternative elements could cause short-term disturbance and/or permanent conversion of agricultural lands. Construction activities could cause direct disturbance to agricultural lands or indirectly disrupt agricultural lands and activities. Such effects could include disruption of access of farm roads or isolation of areas, rendering them too small to effectively or economically farm during construction. Similarly, some permanent NBWRP Phase 2 alternative elements could cause conversion of all or part of an active agricultural parcel and result in a complete loss of the parcel for agriculture or isolate areas and render them too small to effectively or economically farm during construction.

No Project/No Action Alternative

The No Project Alternative would not conflict with any land use plans, therefore **no impact** would occur.

None of the components of the No Action Alternatives would disrupt an active agricultural parcel. All of these components would be constructed in parcels not currently given to active agricultural use or in roadways. Therefore **no impact** would occur.

Proposed Action

All of the elements of the Proposed Action would be constructed and operated within existing treatment facilities, roadways, or other developed areas. The Proposed Action would not impact the agricultural use of important farmland. Therefore, there would be **no impact**.

Program Elements

Of the NBWRP Phase 2 Program Elements, only the Novato SD Seasonal Storage and the Novato SD/Marin County Environmental Enhancement (County Projects 5 and 6) components would affect active farmland and Farmlands of Local Importance. No other classifications of farmland would be affected. The Seasonal Storage parcel would convert 23 acres. County Project 5 would convert 50 acres of Farmland of Local Importance, while County Project 6 would convert 510 acres. This would

constitute a total conversion of 583 acres out of a total of over 984,400 acres of [classified] farmland in the three-county region. This would be a conversion of 0.06 percent in the region; therefore, this impact would be considered **less than significant**.

Storage Alternative

Under the Storage Alternative, all of the seasonal storage projects would permanently convert active farmland and Farmlands of Local Importance to reservoirs. No other classifications of farmland would be affected. The Novato SD Route 37 Seasonal Storage component would convert 24 acres. The SVCSD Mulas Storage component would convert 8 acres. Petaluma's proposed storage reservoir southeast of the Ellis Creek WRF would convert 129 acres. The Napa SD Jameson Ranch storage reservoirs would convert 47 acres. This would constitute a total conversion of 208 acres out of a total of over 984,400 acres of State-classified farmland in the three-county region. This would be a conversion of approximately 0.02 percent in the region; therefore, this impact would be considered **less than significant**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.7.3.3 Impact Summary by Service Area

Appendix 3.7B provides a summary of potential Project impacts per Member Agency related to land use and agricultural resources.

3.8 Transportation and Traffic

This section describes regional and local roadways, public transit, and bicycle and pedestrian transportation in the project area in Section 3.8.1, *Affected Environment*. Section 3.8.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.8A. During scoping for this EIR/EIS, transportation and traffic-related concerns raised by the public and responsible agencies included a letter from the California Department of Transportation (Caltrans), in which they requested information about anticipated construction staging adjacent to U.S. 101, SR 116, and SR 29 and suggested that a Transportation Management Plan may be required if traffic restrictions and detours are needed along or near these routes.

3.8.1 Affected Environment

3.8.1.1 Regional Roadways

Regional access to the NBWRP's service areas (i.e., on Interstate and State freeways/highways) varies from area to area, but in general, the Napa-Sonoma-Novato region connects with areas to the northeast via *Interstate 80 (I-80)*, with areas to the northwest and southwest via *United States Highway 101 (U.S. 101)*, with areas to the north via *State Route (SR) 12 and SR 29*, and with areas to the southeast via *SR 4 and I-580*.[1] Regional access is also provided by three state highways, *SR 37, SR 116 and SR 221*, each of which would be used to transport construction materials, equipment, and workers to and throughout project areas. The project areas are illustrated in figures in **Appendix A**.

Novato SD. *SR 37* is a four-lane divided highway with a mix of at-grade intersections and freeway-like interchanges. In the Novato SD Service Area, SR 37 connects with Atherton Avenue via ramps. At the Atherton Avenue interchange, SR 37 has an annual average daily traffic (ADT) of about 41,000 vehicles and a peak month ADT of about 42,500 vehicles (Caltrans, 2016).[2]

U.S. 101 is an eight-lane freeway in the Novato area, with a ramp connection with Nave Drive (Hamilton Field area) 37. At the Nave Drive interchange, U.S. 101 has an annual ADT of 158,000 to 170,000 vehicles and a peak month ADT of 172,000 to 185,000 vehicles (Caltrans, 2016).

SVCSD. *SR 12* is generally a two-lane highway that passes through the service area. SR 12 widens to include turning lanes in both directions at its intersection with Watmaugh Road, and widens to four lanes plus turning lanes in both directions at its intersection with Leveroni Road – Napa Road. The current travel pattern within the City of Sonoma is dominated by SR 12, which passes through downtown Sonoma and includes portions of Broadway, West Napa Street, and the Sonoma Highway. SR 12 has an annual ADT that ranges from about 5,700 to 12,900 vehicles, and a peak month ADT that ranges from about 6,200 to 13,600 vehicles (Caltrans, 2016).

MMWD. I-580 is a four-lane freeway that connects the North Bay (San Rafael, etc.) and the East Bay (Richmond, etc.). In the MMWD service area, I-580 connects with Sir Francis Drake Boulevard (SFD Boulevard) via ramps. At the SFD Boulevard interchange, I-580 has an annual ADT that ranges from about 54,000 to 82,000 vehicles and a peak month ADT ranging from about 56,000 to 86,000 vehicles (Caltrans, 2016).

U.S. 101 is an eight-lane freeway in the Larkspur area, with a ramp connection with SFD Boulevard. At the SFD Boulevard interchange, U.S. 101 has an annual ADT of 149,000 to 172,000 vehicles and a peak month ADT of 162,000 to 187,000 vehicles (Caltrans, 2016).

Napa SD. Regional access to the Napa SD Water Recycling Facility is provided by *SR 29* and *SR 221* (each a four-lane divided highway) at an at-grade intersection with Soscol Ferry Road. At that intersection, SR 29 has an annual ADT of 49,000 to 64,000 vehicles (a peak month ADT of 53,000 to 67,000 vehicles), and SR 221 has an annual ADT of 32,000 vehicles (a peak month ADT of 38,500 vehicles) (Caltrans, 2016).

Petaluma. *SR 116* is a two-lane highway that connects SR 121 (south of the City of Sonoma) with SR 1 (at Jenner, on the coast). In the area of the Ellis Creek Water Recycling Facility (WRF), SR 116 connects with U.S. 101 via ramps. At the U.S. 101 interchange, SR 116 has an annual ADT of 38,500 vehicles (a peak month ADT of 39,500 vehicles) (Caltrans, 2016). The ADT decreases farther from U.S. 101, with a range of 17,100 to 19,500 vehicles (peak month ADT of 17,500 to 20,000) near the Ellis Creek WRF.

U.S. 101 is a four-lane freeway in the Petaluma area, with a ramp connection with SR 116. At the SR 116 interchange, U.S. 101 has an annual ADT of 92,000 to 104,000 vehicles and a peak month ADT of 99,000 to 112,000 vehicles (Caltrans, 2016).

[1] Although not located within the NBWRP area, SR 4 is described to define the general characteristics of the Regional Roadway system.
[2] The peak-month daily traffic volume represents average conditions for the month of heaviest traffic flow; the Caltrans publication does not identify the specific month in which these higher traffic volumes occur.

American Canyon. *SR 29* is a four-lane highway that connects SR 37 with the City of Napa, and provides regional access to the American Canyon Water Reclamation Facility (American Canyon WRF). SR 29 has an annual ADT that ranges from about 43,500 to 48,500 vehicles and a peak month ADT ranging from about 45,500 to 51,000 vehicles (Caltrans, 2016).

3.8.1.2 Local Roadways and Public Transit

The local roadways that border, cross, or may be used to access the project corridors / work sites, as well as public transit routes and bikeways that run on those local roads, are described below. Some roadways would be affected by pipeline construction, while others would be used for access throughout project construction. Bicycle facilities that could be affected by the project include bike lanes and bike routes. Bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes share roadways with other vehicles, as they are designated for bicycle use with signs, but have no separate lane width.

Novato SD

Local Roadways. DeLong Avenue is a four-lane roadway, with areas of on-street parking and other areas with no parking, and Golden Gate Transit bus routes west of U.S. 101.

Davidson Street is a two-lane roadway that connects DeLong Avenue with the Novato SD Recycled Water Facility (RWF). There is no parking permitted on this street, and no transit service.

Rowland Boulevard is a four-lane, divided, roadway from east of South Novato Boulevard to Vintage Way. There are bike lanes, varying provision for on-street parking, and Golden Gate Transit bus routes on this road.

Public Transit. The project area is served by the following Golden Gate Transit and Marin Transit bus routes (GGBHTD, 2017).

Route 56 (Golden Gate Transit) runs on Rowland Boulevard every 30 minutes on weekdays in commute direction only (southbound to San Francisco, 5:30 to 7:30 AM; northbound to Novato, 3:30 to 6:00 PM).

Route 58 (Golden Gate Transit) runs on DeLong Avenue every 20 to 30 minutes on weekdays in commute direction only (southbound to San Francisco, 6:00 to 7:15 AM; northbound to Novato, 4:30 to 5:30 PM).

Route 70 (Golden Gate Transit) runs on DeLong Avenue and Rowland Boulevard every hour between 5:00 AM and 11:00 PM.

Route 101 (Golden Gate Transit) runs on DeLong Avenue hourly, except every 30 minutes in commute direction (weekdays), and except 30 minutes during midday period (Saturday).

Route 35 (Marin Transit) runs on DeLong Avenue and Rowland Boulevard every 30 minutes between 6:00 AM and 9:00 PM, and then hourly to 11:00 PM.

Route 71X (Marin Transit) runs on DeLong Avenue and Rowland Boulevard every 30 minutes between 6:00 AM and 7:00 PM (weekdays only).

Route 251 (Marin Transit) runs on Rowland Boulevard every hour between 6:30 AM and 8:30 PM (weekdays), and between 8:30 AM and 9:30 PM (weekends).

SVCSD

Local Roadways. Napa Road is a two-lane roadway. East of Fifth Street East, on-street parking is not permitted. The pavement width is about 60 feet. Napa Road becomes Leveroni Road west of Broadway.

Broadway is designated SR 12 – Sonoma Highway, where a cross section that varies from two lanes (with and without a center left-turn lane) to a four-lane roadway with a center left-turn lane. There are areas of on-street parking and other areas with no parking, and segments with bike lanes.

Public Transit. There is no transit service on Napa Road or the above-described roads.

MMWD

Local Roadways. Sir Francis Drake Boulevard is a two-lane road that connects I-580 and U.S. 101 (and extends west of U.S. 101), with no on-street parking permitted.

Andersen Drive is a two-lane road, with bike lanes and no on-street parking permitted in the segments affected by the Phase 2 Program.

Public Transit. There is no transit service on the above-described roads within the Phase 2 Program area.

Napa SD

Local Roadways. Soscol Ferry Road is a two-lane road, beginning at the intersection of State Route 12/29 and State Route 221, and terminating at the Soscol Water Recycling Facility.

Public Transit. There is no transit service on the above-described road.

Petaluma

Local Roadways. Roadways affected by the projects in the Petaluma area are generally two-lane roads, with no bike facilities, or public transit. These include the following: Maria Drive, Telford Lane, Stonehenge Way, Morning Glory Drive, Ely Road, Fieldstone Lane, Flanigan Way, Clary Way, Castle Drive, Windmill Lane, Sleepy Hollow Lane, Ellis Street, Johnson Street, Lindberg Lane, St. Francis Drive, Baywood Drive, Daniel Drive, Park Lane, Louise Drive, Oneel Drive, Parent Way, Juliet Drive, Cypress Drive, Pine View Way, Lakeville Highway, Old Lakeville Road No. 1, Cannon Lane/Mangel Ranch Road, and Niemela Road. Exceptions to the above character of road are as follows:

1. Sonoma Mountain Parkway, Rainier Avenue, Caulfield Lane, and East Washington Street are four-lane roads, with the latter also having a center two-way left-turn lane (TWLTL). South McDowell Boulevard is a two-lane road with a center TWLTL.

Public Transit. The project area is served by the following Golden Gate Transit, Sonoma County Transit, and Petaluma Transit bus routes (GGBHTD, 2017; SC Transit, 2017; Petaluma Transit, 2017).

Route 76 (Golden Gate Transit) runs on Ely Road every 30 minutes on weekdays in commute direction only (southbound to San Francisco, 5:00 to 7:00 AM; northbound to Novato, 3:00 to 5:30 PM).

Route 44 (Sonoma County Transit) runs sporadically on Sonoma Mountain Parkway weekdays only.

Route 33 (City of Petaluma Transit) runs on Maria Drive and Sonoma Mountain Parkway every 60 minutes on weekdays and weekend days, 6:25 AM to 8:25 PM.

American Canyon

Local Roadways. Roadways affected by the projects in American Canyon are generally two-lane roads, with no bike facilities, or public transit. These include the following: Spikerush Circle, Hess Road, Lombard Road, Dodd Court, Klamath Court, Hanna Drive, Mezzetta Court, Jim Oswalt Way, Green Island Road and Tower Road. Exceptions to the above character of road are as follows:

1. Benton Way is a two-lane road with bike lanes.
2. Donaldson Way East is a two-lane road that flares out to a four-lane width at its intersection with SR 29.
3. Devlin Road is a two-lane road with a center TWLTL.

Public Transit

Route 11 (American Canyon Transit, 2017) runs on Broadway (SR 29) on an irregular schedule on weekdays and weekends.

American Canyon Shuttle (American Canyon Transit, 2017) runs on Broadway (SR 29) on an irregular schedule on weekdays only.

3.8.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Transportation and Traffic issues and used to determine the significance criteria presented in **Section 3.8.3.1** is found in **Appendix 3.8A**.

3.8.3 Direct and Indirect Effects

3.8.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would result in a significant impact on transportation and traffic if it would:

1. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

2. Conflict with an applicable congestion management program including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
4. Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment);
5. Result in inadequate emergency access; or
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

In addition to the above-listed criteria, the following criteria are derived from common engineering practice to apply to the project-specific analysis presented herein:

7. Substantially increase traffic safety hazards due to increased traffic volumes; or
8. Cause substantial damage or wear of public roadways by increased movement of heavy vehicles

3.8.3.2 Impacts Not Further Evaluated

NBWRP Phase 2 and alternatives would have no impact related to the following considerations identified in Appendix G of the CEQA Guidelines. Because neither NBWRP Phase 2 nor the alternatives would result in any direct or indirect impact related to these considerations, none could cause or contribute to any cumulative impact. Therefore, these considerations are not addressed further in this Section 3.8.

Exceedance of LOS Standards Established by the County Congestion Management Agency. As discussed above, long-term operation of any NBWRP Phase 2 facility is anticipated to be similar to the existing traffic and circulation conditions within the project area, with the addition of a minimal increase in maintenance worker trips. Increases in traffic volumes generated by construction projects end when construction activities end. As such, county LOS standards are not used to judge potential impacts presented herein.

Air Traffic Patterns. NBWRP facilities would not affect air traffic patterns of nearby airports. Construction equipment would not exceed height restrictions within this area. Therefore, NBWRP Phase 2 would not alter air traffic patterns nor result in substantial safety risks associated with airport operations.

Increased Hazards Due to a Design Feature or Incompatible Uses. NBWRP Phase 2 elements would not include new design features (e.g., new facilities or obstructions within public roadways) or alterations of existing features (e.g., road realignment). In addition, traffic generated by NBWRP Phase 2 would be compatible with the mix of vehicle types (autos and trucks) currently using project area roads. Therefore, NBWRP Phase 2 would not result in hazards caused by a design feature or incompatible use.

Conflicts with Adopted Policies, Plans, or Programs Supporting Alternative Transportation. NBWRP Phase 2 would not directly or indirectly eliminate alternative transportation corridors or facilities (e.g., bike paths, lanes, bus turnouts, etc.) both because of facility locations and because of the short-term nature of construction activities where potential effects could occur. In addition, NBWRP Phase 2 would not include changes in policies or programs that support alternative transportation. Therefore, NBWRP Phase 2 would not conflict with adopted policies, plans, or programs supporting alternative transportation.

3.8.3.3 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of

secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water.

Impact 3.8.1: Construction of NBWRP Phase 2 would have temporary and intermittent effects on traffic and transportation conditions in the project area. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, the level of project-generated traffic could be noticeable by local residents/drivers on those local streets, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Proposed Action

Projects under NBWRP Phase 2 would not introduce any uses to the project corridor that would generate noticeable long-term changes in traffic; operational traffic would be limited to infrequent trips by maintenance personnel and by vehicles delivering chemicals to treatment plants. Thus, potential traffic and transportation effects would be confined to construction of the proposed facilities. Construction-generated traffic would be temporary and, therefore, would not result in any long-term degradation in operating conditions or level of service on any project roadways. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles.

Pipelines

In addition to increased traffic generated by construction workers and trucks, elements under the Proposed Action that consist of pipeline installation would affect traffic flow by temporarily reducing the capacity of the affected roads because of lane closures and in some cases, road closures. For the purposes of this EIR/EIS, impact analysis assumes that pipeline installation associated with the implementation of individual projects would be within existing roadway or railroad rights-of-way. Construction of the proposed pipelines would involve one of the four potential methods: trenching; jack and bore tunneling; directional drilling; or suspending the pipe (such as in the presence of a bridge). These methods are described in detail in **Section 2.10.1**, ***Recycled Water Pipelines***.

Trip Generation

Construction activities conducted under NBWRP Phase 2 would results in increased traffic volumes on area roadways generated by the daily arrival and departure of constructions workers, and by trucks hauling equipment and materials to and from the construction sites. It is estimated that each project under NBWRP Phase 2 would generate about 18 to 30 one-way worker trips per day, and about 2 to 18 one-way heavy truck trips per day. Average daily trip generation associated with construction of NBWRP Phase 2 that could occur simultaneously were combined to determine the "worst-case" scenario, estimated to occur in 2020 and include simultaneous construction of the following NBWRP Phase 2:

1. Turnout to Wetlands (Novato SD);
2. Napa Road Pipeline (SVCSD);
3. San Quentin Prison Recycled Water Distribution System (MMWD);
4. Soscol WRF Covered Storage, with Pipelines (Napa SD);
5. Urban Recycled Water Expansion (Petaluma);
6. Agricultural Recycled Water Expansion (Petaluma); and
7. Recycled Water Distribution Expansion Phase 2 (American Canyon).

However, as evident from the locations of the seven above-cited projects increased traffic generated by construction activities associated with these overlapping (in time) projects generally would not use the same roadways. As such, the impact of increased traffic on traffic and transportation conditions for these projects generally would not be additive. An exception would be the potential concurrent use of U.S. 101 to access the project work sites for MMWD's San Quentin Prison Recycled Water Distribution System (Sir Francis Drake Boulevard interchange); Novato SD's Turnout to Wetlands (Nave Drive interchange); SVCSD's Napa Road Pipeline (SR 37 interchange); and Petaluma's Urban Recycled Water Expansion and Agricultural Recycled Water Expansion (SR 116 interchange). The level of increased traffic on U.S. 101 from the simultaneous construction of these projects would decrease as one travels farther north on U.S. 101. The other exception would be the potential concurrent use of SR 29 to access the project work sites for the Napa SD's Soscol WRF Covered Storage (SR 29 to Soscol Ferry Road) and American Canyon's Recycled Water Distribution Expansion Phase 2 (SR 29 to local streets).

The concurrent construction activities would increase the average daily traffic volume on U.S. 101 and SR 29 by no more than 0.01 percent (i.e., too small of a change to be perceived by the average motorist). Traffic increases on local roads would be more noticeable, but the roadways would continue to accommodate traffic within the roadways' carrying capacity (see discussion below under each Member Agency's NBWRP Phase 2 element). Proposed hours of construction are between 8:00 AM and 7:00 PM unless stipulated (in coordination with responsible jurisdiction) that night construction could be used to minimize impacts to traffic flow. Truck trips related to off-hauling of excavated material from pipeline trenches and deliveries of equipment and materials would be dispersed over the course of the day, thus lessening the effect on traffic flow conditions. Project truck traffic occurring weekdays during the hours of 7:00 to 9:00 AM and 4:00 to 6:00 PM would coincide with peak-period traffic and, therefore, would have the greatest potential to impede traffic flow. While the construction contractor for each NBWRP Phase 2 element would likely schedule truck trips to avoid peak traffic hours on area roadways, dispersion of the above-described less-than-substantial number of truck trips over the hours of the day would cause less-than-significant impacts on traffic flow during any specific hour. The primary impacts from the movement of construction trucks would include short-term and intermittent lessening of roadway capacities due to slower movements and larger turning radii of the trucks compared to passenger vehicles. In addition, drivers could experience delays if they were traveling behind a construction truck.

A discussion of individual Member Agencies is provided below. Traffic increases associated with construction of the individual projects within NBWRP Phase 2 would be less than the above-described concurrent construction activities. The impact of temporary reduction to roadway capacity (i.e., lane or road closure) could be significant (though short-term). With the implementation of **Mitigation Measures 3.8.1a** through **3.8.1f**, which include compliance with local road encroachment permits and the *Work Area Protection and Traffic Control Manual,* preparation of a Traffic Control Plan, identification of roadways that require special construction techniques, development of a circulation and detour plan, and consultation with local transit service providers, the impacts would be **less than significant with mitigation.**

Novato SD

RWF Treatment Capacity Expansion. Construction of the RWF expansion project is expected to begin in early 2022 and take approximately four months to complete. It is estimated that this work would generate about 18 one-way worker trips per day, and about 2 one-way heavy truck trips per day. The Novato SD RWF work site would be accessed from U.S. 101 (at the DeLong Avenue interchange) to Davidson Street (a two-lane street, which narrows as it approaches the RWF). The level of project-generated traffic could be noticeable by local residents, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Marin County Lower Novato Creek Project 1 – Distribution. Construction of this distribution project is expected to begin in mid-2021 and take approximately three months to complete. It is estimated that this work would generate about 24 one-way worker trips per day, and up to about 4 one-way heavy truck trips per day. The work site would be accessed from U.S. 101 (at the DeLong Avenue interchange) to Davidson Street (a two-lane street, which narrows as it approaches the RWF). The level of project-generated traffic could be noticeable by local residents, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Turnout to Wetlands. Construction of the turnout from the existing Novato SD outfall is expected to begin in early-2021 and take approximately two weeks to complete. It is estimated that this work would generate about 24 one-way worker trips per day and up to about 18 one-way heavy truck trips per day. The work site would be accessed from U.S. 101 to Nave Drive and Hamilton Parkway (two-lane streets) to an existing access/service road. The level of project-generated traffic could be noticeable by local residents/drivers on those local streets, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

SVCSD

SVCSD Napa Road Pipeline. Construction of the pipeline would begin in early 2020 and would be expected to take approximately six months to complete. It is assumed that installation of the pipeline would require jack-and-bore crossing at East 8th Street and at a creek east of Hyde Road. It is estimated that this work would generate about 24 one-way worker trips per day, and up to about 6 one-way heavy truck trips per day. The pipeline alignment would be accessed from Broadway/SR 12 (two to four lanes) to Napa Road (two lanes). The level of project-generated traffic could be noticeable by local residents / drivers on those local streets, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

It is anticipated that the size (diameter) of the pipe and width of Napa Road would require temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) during installation of the pipeline (i.e., no full road closure would be needed).

MMWD

San Quentin Prison Recycled Water Distribution System. Construction of NBWRP Phase 2 element is expected to begin in late-2019 and take approximately six months to complete.

It is estimated that this work would generate up to about 24 one-way worker trips per day and up to about 4 one-way heavy truck trips per day. The work site on the prison grounds and the pipeline alignment would be accessed from U.S. 101 to SFD Boulevard and Andersen Drive (two-lane roads). The level of project-generated traffic could be noticeable by local residents/ drivers on those local streets, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

It is anticipated that the size (diameter) of the pipe and width of SFD Boulevard could allow temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) during installation of the pipeline (i.e., no full road closure would be needed). However, given the nature of the road (i.e., providing an important connection between U.S. 101 and I-580, and access for the Larkspur Ferry Landing), impacts to traffic flow during daytime hours would be significant, and pipeline installation in SFD Boulevard would require night-time work (in coordination with Marin County). Pipeline installation on prison grounds and in Andersen Drive would occur during daytime hours.

Napa SD

Soscol WRF Increased Filter Capacity and Soscol WRF Covered Storage. The construction of these facilities is expected to begin in late-2018 and take approximately 4 months to complete. It is estimated that this work would generate up to about 30 one-way worker trips per day and about 2 one-way heavy truck trips per day. The work site would be accessed from Soscol Ferry Road (two-lane road) that connects the intersection of SR 12/29/221 and the Soscol Water Recycling Facility. The level of project-generated traffic would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Petaluma

Ellis Creek WRF Increased Capacity. The construction of Ellis Creek WRF capacity expansion is expected to begin in mid-2019 and take approximately 8 months to complete. It is estimated that this work would generate up to about 18 one-way worker trips per day, and about 2 one-way heavy truck trips per day. The work site would be accessed from U.S. 101 to SR 116 / Lakeville Highway (two-lane road). The level of project-generated traffic would increase traffic volumes on those roadways by no more than 0.01 percent (i.e., too small of a change to be perceived by the average motorist).

Urban Recycled Water Expansion. The Urban Recycled Water Expansion pipeline alignments would be along existing roadways with the City of Petaluma right-of-way. It is assumed that linear pipeline construction would occur at a rate of 100 feet per day, and jack-and-bore crossing would be required at the following eight locations: one at North McDowell Boulevard, two at Sonoma Mountain Parkway, one at Lynch Creek, one at Lynch Creek at Maria Drive and Sunrise Parkway, one at U.S 101 and two at Caulfield Lane. The construction of these pipelines are expected to begin in late-2019 and take approximately 19 months to complete.

It is estimated that this work would generate up to about 24 one-way worker trips per day, and up to about 6 one-way heavy truck trips per day. The pipeline alignments would be accessed from U.S. 101 to SR 116 / Lakeville Highway and to East Washington Street, and then to the local streets within which the pipelines would be installed. The level of project-generated traffic could be noticeable by local residents / drivers on those local streets, but would have a less-than-significant impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) or full road closure on the following two-lane roads (extent of closures would be determined during final project design): Maria Drive, Morning Glory Drive, Telford Lane, Stonehenge Way, Ely Road, Fieldstone Lane, Culpepper Drive, Flanigan Way, Clary Way, Castle Drive, Windmill Lane, Sleepy Hollow Lane, Ellis Street, Johnson Street, Lindberg Lane, St. Francis Drive, Baywood Drive, Daniel Drive, Park Lane, Louise Drive, Oneel Drive, Parent Way, Juliet Drive, Cypress Drive, and Pine View Way. Detour routing is available for these roads. Pipeline installation in Rainier Avenue and Caulfield Lane, four-lane roadways, would require temporary closure of one lane of traffic, but two-way traffic flow would be maintained.

Agricultural Recycled Water Expansion. The construction of the Agricultural Recycled Water Expansion pipelines is expected to begin in late-2019 and take approximately eight days to complete. The installation of the pipelines would require jack-and-boring crossings at Stage Gulch Road. It is estimated that this work would generate up to about 24 one-way worker trips per day, and up to about 6 one-way heavy truck trips per day. The pipeline alignments would be accessed from U.S. 101 to SR 116 / Lakeville Highway, and then to the local roads within which the pipelines would be installed. The level of project-generated traffic could be noticeable by local residents / drivers on those local roads, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Project construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) or full road closure on the following two-lane roads (extent of closures would be determined during final project design): Old Lakeville Road No. 1, Cannon Lane/Mangel Ranch Road, and Niemela Road; detour routing is available for these roads.

It is anticipated that the size (diameter) of the pipe and width of Lakeville Highway could allow temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) during installation of the pipeline (i.e., no full road closure

would be needed). However, given the nature of the road (i.e., State Route 116), impacts to traffic flow during daytime hours would be significant and pipeline installation in Lakeville Highway would require night-time work (in coordination with Caltrans and Sonoma County).

American Canyon

Recycled Water Distribution System Expansion. The construction of the Recycled Water Distribution System Expansion pipelines is expected to begin in late-2018 and take approximately nine months to complete in two construction seasons.

It is estimated that this work would generate up to about 24 one-way worker trips per day, and up to about 4 one-way heavy truck trips per day. The pipeline alignments would be accessed from four-lane SR 29 (Broadway), and then to the local two-lane streets within which the pipelines would be installed. The level of project-generated traffic could be noticeable by local residents / drivers on those local streets, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Project construction of pipelines would include temporary closure of one lane of traffic (with alternate one-way traffic flow past the construction zone) or full road closure on the following two-lane roads (extent of closures would be determined during final project design): Devlin Road, Tower Road, Spikerush Circle, Benton Way, Dodd Court, Klamath Court, Brunello Drive, Pelleria Drive, Hess Road, Lombard Road, and Donaldson Way East. Detour routing is available for these roads.

It is anticipated that the size (diameter) of the pipe and width of four-lane Broadway could allow temporary closure of one lane of traffic during installation of the pipeline (i.e., no full closure of both lanes in the northbound or southbound direction would be needed). However, given the nature of the road (i.e., State Route 29), impacts to traffic flow during daytime hours would be significant and pipeline installation in Broadway would require night-time work (in coordination with Caltrans and American Canyon).

WRF Phase 2 Treatment Plant Upgrades. This project would include facility upgrades at the existing American Canyon WRF to increase tertiary treatment process to improve water quality for existing and future recycled water users. Phase 2 treatment plan upgrades at the existing American Canyon WRF would consist of the installation of one two-stage reverse osmosis (RO) system, modifications to ponds and addition of a concentrate disposal system, pipelines between the existing membrane bioreactor system to the RO system, and pipelines between the RO system and the evaporation pond. All construction activities would occur within the American Canyon WRF. The construction of these facilities and pipelines are expected to begin in late-2021 and take approximately six months to complete.

It is estimated that this work would generate up to about 24 one-way worker trips per day, and about four one-way heavy truck trips per day. The work site would be accessed from SR 29 to Paoli Loop Road, Green Island Road to Mezzetta Court (two-lane roads). The level of project-generated traffic would increase traffic volumes on those roadways by no more than 0.01 percent (i.e., too small of a change to be perceived by the average motorist).

Program Elements

Six additional NBWRP Phase 2 elements are evaluated at a program element level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. These elements include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA. Because the exact timeframe and construction schedule and phasing for these projects are currently unknown, the construction traffic generation and its impact on area roadways cannot be determined. However, assuming that the number of construction workers and equipment/materials for these projects are similar to the Proposed Action, it is estimated that each Program Element would generate up to about 24 one-way worker trips per day, and up to about 6 one-way heavy truck trips per day. That level of traffic would not be a substantial increase of traffic volumes on area roadways (i.e., too small of a change to be perceived by the average motorist, or while noticeable by local residents, well within the carrying capacity of the roads).

Storage Alternative

Construction of the Novato SD RWF expansion project is expected to begin in early 2022 and take approximately four months to complete. It is estimated that the work would generate about 18 one-way worker trips per day, and about two one-way heavy truck trips per day. The work site would be accessed from U.S. 101 (at the DeLong Avenue interchange) to Davidson Street (a two-lane street, which narrows as it approaches the RWF). The level of project-generated traffic could be noticeable for local residents, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

It is estimated that the pipeline work would generate up to about 24 one-way worker trips per day, and up to about six one-way heavy truck trips per day. The level of project-generated traffic could be noticeable by local residents / drivers on the local streets, but would have a less-than-significant impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Construction of each of the new seasonal storage reservoirs would include site preparation and clearing, excavation, earth movement, linear placement, embankment construction, and hydro-seeding. It is expected that no excavated material would need to be off-hauled (i.e., it would be used to build embankments or spread over the nearby surrounding area). It is estimated that construction activities could generate up to 40 one-way off-site construction worker vehicle trips and up to 120 one-way truck trips per work day. The reservoir sites would be accessed as follows: from SR 37 (Novato SD) at the existing access used for the Deer Island WRP; from Carneros Highway SR 12/121 (SVCSD) near 8th Street East; from SR 116 (Petaluma); and from North Kelly Road (Napa SD), a two-lane road that connects with SR 29 and SR 12. The level of project-generated traffic increases on the state highways (SR 37, SR 12/121, SR 116, and SR 29) would be too small of a change to be perceived by the average motorist (a less-than-significant impact). The level of project-generated traffic on local streets (e.g., North Kelly Road) could be noticeable by local residents / drivers, but would have a **less-than-significant** impact on traffic flow (i.e., would continue to accommodate traffic within the roadways' carrying capacity).

Mitigation Measures

Mitigation Measure 3.8.1a: The appropriate Member Agency for each NBWRP Phase 2 element shall obtain and comply with local road encroachment permits for roads that are affected by construction activities.

The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 2014). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval) required by **Mitigation Measure 3.8.1b**, below, would direct how traffic flow is safely maintained during project construction.

Mitigation Measure 3.8.1b: The construction contractor for each NBWRP Phase 2 element shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall:

1. Identify hours of construction (between 7:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM unless stipulated in coordination with responsible jurisdiction on a case-by-case basis);
2. Identify hours for deliveries;
3. Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging;
4. Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones);
5. Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints;
6. Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times;
7. Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through inclusion of such provisions in the construction contract. The assignment of temporary crossing guards at designated intersections may be needed to enhance pedestrian safety during project construction;
8. Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and
9. Specify the street restoration requirements pursuant to agreements with the local jurisdictions.

Mitigation Measure 3.8.1c: The appropriate Member Agency for each NBWRP Phase 2 element shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow.

Mitigation Measure 3.8.1d: The appropriate Member Agency for each NBWRP Phase 2 element shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.

Mitigation Measure 3.8.1e: The appropriate Member Agency for each NBWRP Phase 2 element shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way.

Mitigation Measure 3.8.1f: The appropriate Member Agency for each NBWRP Phase 2 element shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.

Impact Significance after Mitigation: Less than Significant.

Impact 3.8.2: Construction of NBWRP Phase 2 would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers). (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** associated with temporary disruption of circulation patterns under the No Project Alternative.

Under the No Action Alternative, it is assumed that these elements would have impacts similar to those of the Proposed Action. Likewise, with implementation of **Mitigation Measures 3.8.2a, 3.8.2b,** and **3.8.2c** would ensure that potential impacts associated with temporary effects on emergency access and access to public schools are **less than significant with mitigation**.

Proposed Action

Projects under NBWRP Phase 2 would have temporary effects on traffic flow, particularly with pipeline construction which would occur at a rate of 100-200 feet per day (as described in **Section 2.10**) within road rights of way. Pipeline construction within or across streets could result in delays for emergency vehicle access, and would also obstruct pedestrian, bicycle, and vehicle access to schools, thus disrupting the Safe Routes to School programs that are currently in place. Construction along the pipeline alignments would temporarily cause delays to school buses and limit access to school bus stops.

Construction of the storage facilities, pump stations, and upgrades to existing treatment plants would not directly interfere with circulation patterns near sensitive land uses because no schools, hospitals, fire stations, police stations, or other emergency providers are located adjacent to these proposed facilities. However, construction could indirectly disrupt circulation patterns near sensitive land uses, as haul route could pass by sensitive land uses, and traffic may divert to roadways with sensitive land uses due to construction activity.

Implementation of **Mitigation Measures 3.8.2a** and **3.8.2b** would require the appropriate Member Agency for each NBWRP Phase 2 element to coordinate with the appropriate local school district regarding construction schedule in the vicinity of schools and school access routes during construction. Implementation of **Mitigation Measure 3.8.2c** (i.e., **Mitigation Measure 3.8.1b**) would require the construction contractor to establish methods for maintaining traffic flow in and along the project corridor and minimizing disruption to emergency vehicle access to land uses along the alignment. Specific requirements that may be included in the traffic control/traffic management plan regarding emergency access and access to public schools are identified under **Mitigation Measure 3.8.1b**. Implementation of **Mitigation Measures 3.8.2a, 3.8.2b,** and **3.8.2c** would ensure that potential impacts associated with temporary effects on emergency access and access to public schools are **less than significant with mitigation**.

Program Elements

Six additional NBWRP Phase 2 elements are evaluated at a program element level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. These elements include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA. Because the exact timeframe and construction schedule and phasing for these projects are currently unknown, the construction traffic generation and its impact on area roadways cannot be determined. However, it is assumed that these elements would have impacts similar to those of the Proposed Action. Likewise, with implementation of **Mitigation Measures 3.8.2a, 3.8.2b,** and **3.8.2c** would ensure that potential impacts associated with temporary effects on emergency access and access to public schools are **less than significant with mitigation**.

Storage Alternative

Implementation of the Storage Alternative elements would result in circulation impacts similar to those of the Proposed Action. Likewise, with implementation of **Mitigation Measures 3.8.2a, 3.8.2b,** and **3.8.2c** would ensure that potential impacts associated with temporary effects on emergency access and access to public schools are **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.8.2a: Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, the appropriate Member Agency for each NBWRP Phase 2 element shall coordinate with the appropriate local school district to identify peak

circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods.

Mitigation Measure 3.8.2b: A minimum of two months prior to project construction, the appropriate Member Agency for each NBWRP Phase 2 element shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.8.1a**).

Mitigation Measure 3.8.2c: Implement Mitigation Measure 3.8.1b.

Impact Significance after Mitigation: Less than significant.

Impact 3.8.3: Construction of NBWRP Phase 2 would have temporary effects on alternative transportation or alternative transportation facilities. (Less than Significant with Mitigation)

No Project/No Action Alternative

Under the No Project Alternative, there would be **no impact** on alternative transportation or associated facilities.

Under the No Action Alternative, pipeline construction could disrupt access to bus stops and slow bus movements for bus routes provided by the transit service providers in the affected areas. Implementation of **Mitigation Measure 3.8.3** would ensure potential impacts associated with temporary disruptions to transit service are **less than significant with mitigation**.

Proposed Action

Projects under NBWRP Phase 2 would have no long-term impact on demand for alternative transportation or on alternative transportation facilities (i.e., for transit and bicyclists). However, pipeline construction could disrupt access to bus stops and slow bus movements for bus routes provided by the transit service providers in the affected areas (see *Public Transit* discussion in the Affected Environment discussion above).

Implementation of **Mitigation Measure 3.8.3** (i.e., **Mitigation Measure 3.8.1f**) would require the construction contractor to establish methods for minimizing construction effects on transit service. Specific requirements that may be included in the traffic control/traffic management plan are identified under **Mitigation Measure 3.8.1f**. Implementation of **Mitigation Measure 3.8.3** would ensure potential impacts associated with temporary disruptions to transit service are **less than significant with mitigation**.

Program Elements

Pipeline construction associated with the Program Elements could disrupt access to bus stops and slow bus movements for bus routes provided by the transit service providers in the affected areas. Implementation of **Mitigation Measure 3.8.3** would ensure potential impacts associated with temporary disruptions to transit service are **less than significant with mitigation**.

Storage Alternative

Pipeline construction under the Storage Alternative could disrupt access to bus stops and slow bus movements for bus routes provided by the transit service providers in the affected areas. Implementation of **Mitigation Measure 3.8.3** would ensure potential impacts associated with temporary disruptions to transit service are **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.8.3: Implement **Mitigation Measure 3.8.1f**.

Impact Significance after Mitigation: Less than significant.

Impact 3.8.4: Construction of NBWRP Phase 2 would temporarily increase the potential for accidents on project roadways. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** on the potential for accidents under the No Project Alternative.

The projects under the No Action Alternative would not change the long-term configuration of area roadways and would not introduce types of vehicles that are not already traveling on area roads. However, construction zones in the public right-of-way and heavy equipment operating adjacent to or within a road right-of-way would increase the potential for accidents. Construction-

generated trucks on project area roadways would interact with other vehicles. Potential conflicts also could occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses).

Implementation of **Mitigation Measure 3.8.4** requires the contractor to prepare a traffic control/traffic management plan in accordance with professional engineering standards prior to construction, including compliance with roadside safety protocols, so as to reduce the risk of accidents. Specific requirements that may be included in the traffic management plan are identified under **Mitigation Measures 3.8.1b** through **3.8.1f.** Thus, implementation of **Mitigation Measure 3.8.4** would ensure temporary increases in the potential for accidents are **less than significant with mitigation**.

Proposed Action

Projects under the Proposed Action would not change the long-term configuration (alignment) of area roadways, and would not introduce types of vehicles that are not already traveling on area roads. However, construction zones in the public right-of-way and heavy equipment operating adjacent to or within a road right-of-way would increase the potential for accidents. Construction-generated trucks on project area roadways would interact with other vehicles. Potential conflicts also could occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses).

Implementation of **Mitigation Measure 3.8.4** (i.e., **Mitigation Measures 3.8.1b** through **3.8.1f**) requires the contractor to prepare a traffic control/traffic management plan in accordance with professional engineering standards prior to construction, including compliance with roadside safety protocols, so as to reduce the risk of accidents. Specific requirements that may be included in the traffic management plan are identified under **Mitigation Measures 3.8.1b** through **3.8.1f**. Thus, implementation of **Mitigation Measure 3.8.4** would ensure temporary increases in the potential for accidents are **less than significant with mitigation**.

Program Elements

As with the Proposed Action, the Project Elements would not change the long-term configuration of area roadways and would not introduce types of vehicles that are not already traveling on area roads. However, construction zones in the public right-of-way and heavy equipment operating adjacent to or within a road right-of-way would increase the potential for accidents. Construction-generated trucks on project area roadways would interact with other vehicles. Potential conflicts also could occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses).

Implementation of **Mitigation Measure 3.8.4** requires the contractor to prepare a traffic control/traffic management plan in accordance with professional engineering standards prior to construction, including compliance with roadside safety protocols, so as to reduce the risk of accidents. Specific requirements that may be included in the traffic management plan are identified under **Mitigation Measures 3.8.1b** through **3.8.1f**. Thus, implementation of **Mitigation Measure 3.8.4** would ensure temporary increases in the potential for accidents are **less than significant with mitigation.**

Storage Alternative

These additional elements under the Storage Alternative would not change the long-term configuration of area roadways and would not introduce types of vehicles that are not already traveling on area roads. However, construction zones in the public right-of-way and heavy equipment operating adjacent to or within a road right-of-way would increase the potential for accidents. Construction-generated trucks on project area roadways would interact with other vehicles. Potential conflicts also could occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses).

Implementation of **Mitigation Measure 3.8.4** requires the contractor to prepare a traffic control/traffic management plan in accordance with professional engineering standards prior to construction, including compliance with roadside safety protocols, so as to reduce the risk of accidents. Specific requirements that may be included in the traffic management plan are identified under **Mitigation Measures 3.8.1b** through **3.8.1f**. Thus, implementation of **Mitigation Measure 3.8.4** would ensure temporary increases in the potential for accidents are **less than significant with mitigation**.

Mitigation Measures

Measure 3.8.4: Implement **Mitigation Measure 3.8.1b** through **3.8.1f**.

Impact Significance after Mitigation: Less than significant.

Impact 3.8.5: Construction of the NBWRP Phase 2 would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** on designated haul routes under the No Project Alternative.

The projects under the No Action Alternative would include the use of large trucks to transport equipment and material to and from work site(s) for the projects under NBWRP Phase 2 could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project impacts are expected to be negligible on those roads. Residential streets are generally not built with a pavement thickness or road base that would withstand substantial truck traffic volumes.

Implementation of **Mitigation Measure 3.8.5**, which requires the Member Agency to enter into an agreement prior to construction that would detail pre- and post-construction conditions on project haul routes and pipeline segments and repair damaged roads, would reduce impacts to **less than significant with mitigation**.

Proposed Action

The use of large trucks to transport equipment and material to and from work site(s) for the projects under NBWRP Phase 2 could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project impacts are expected to be negligible on those roads. Residential streets are generally not built with a pavement thickness or road base that would withstand substantial truck traffic volumes.

With the implementation of **Mitigation Measure 3.8.5**, which requires the Member Agency to enter into an agreement prior to construction that would detail pre- and post-construction conditions on project haul routes and pipeline segments and repair damaged roads, the impact is **less than significant with mitigation**.

Program Elements

As with the Proposed Action, the use of large trucks to transport equipment and material to and from work site(s) for the projects under NBWRP Phase 2 could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project impacts are expected to be negligible on those roads. Residential streets are generally not built with a pavement thickness or road base that would withstand substantial truck traffic volumes.

Implementation of **Mitigation Measure 3.8.5**, which requires the Member Agency to enter into an agreement prior to construction that would detail pre- and post-construction conditions on project haul routes and pipeline segments and repair damaged roads, would reduce impacts to **less than significant with mitigation**.

Storage Alternative

These Storage Alternative projects would also include the use of large trucks to transport equipment and material to and from work site(s) for the projects under NBWRP Phase 2 could affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and existing condition of the road. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The project impacts are expected to be negligible on those roads. Residential streets are generally not built with a pavement thickness or road base that would withstand substantial truck traffic volumes.

Implementation of **Mitigation Measure 3.8.5**, which requires the Member Agency to enter into an agreement prior to construction that would detail pre- and post-construction conditions on project haul routes and pipeline segments and repair damaged roads, would ensure that potential impacts on haul routes are **less than significant with mitigation**.

Mitigation Measures

> **Mitigation Measure 3.8.5:** Roads damaged by construction shall be repaired to a structural condition equal to that which existed prior to construction activity as per conditions of the encroachment permit (see **Mitigation Measure 3.8.1a**).

Impact Significance after Mitigation: Less than Significant.

3.8.3.4 Impact Summary by Service Area

Appendix 3.8B provides a summary of potential Project impacts per Member Agency related to transportation and traffic.

3.9 Air Quality

This section describes existing air quality conditions in Section 3.9.1, *Affected Environment.* Section 3.9.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. Setting information and the Regulatory Framework that governs air pollutants of concern (including criteria pollutants and toxic air contaminant (TAC) emissions) and related considerations is presented in Appendix 3.9A. No comments or other input were received during the scoping period for this EIR/EIS regarding air quality.

3.9.1 Affected Environment

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Other important factors are meteorological and topographical conditions. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

3.9.1.1 Local Climatology, Air Quality, and Sensitive Receptors

The project area is located in the counties of Napa, Sonoma, and Marin and is within the boundaries of the San Francisco Bay Area Air Basin (Air Basin), which encompasses the nine-county regions including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. Within the Air Basin, 11 subregions have been defined based on their unique climatology and topography. The project area spans the following four of these subregions: Marin County Basin; Napa Valley; Sonoma Valley, and Cotati and Petaluma Valleys (BAAQMD, 2017a).

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing levels of air quality in the project area can generally be inferred from ambient air quality measurements conducted by BAAQMD stations in the area. The monitoring stations record concentrations of various pollutants including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Ozone and particulate matter concentrations are of most concern because concentrations of these pollutants periodically exceed regulatory standards in the Air Basin. Climate and air quality conditions characteristic of the member agency service areas, as well as discussions of sensitive receptors in the vicinity of the NBWRP Phase 2 project sites are discussed in more detail in **Appendix 3.9A,** and are summarized in **Table 3.9-1**, **Table 3.9-2** and **Table 3.9-3**.

TABLE 3.9-1: AIR POLLUTANT SUMMARY FOR NOVATO SD AND MMWD SERVICE AREAS

Pollutant	Standard	2012	2013	2014	2015	2016
Ozone (O_3)						
Highest 1-hr average, ppm		0.076	0.081	0.088	0.081	0.088
Number of State standard exceedance days	0.09	0	0	0	0	0
Highest 8-hr average, ppm		0.57	0.069	0.068	0.070	0.067
Number of federal standard exceedance days	0.070	0	0	0	0	0
Respirable Particulate Matter-10 Micron (PM_{10})						
Highest 24-hr average, µg/m^3		37.1	54.4	40.9	42.0	27.0
Estimated State standard exceedance days	50	0	6	0	0	0
Estimated federal standard exceedance days	150	0	0	0	0	0
State Annual Average, µg/m^3	20	13.3	15.6	14.1	16.1	13.6
Exceedance?		No	No	No	No	No
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)						
Highest 24-hr average, µg/m^3		26.5	44.9	38.1	36.3	15.6
Estimated federal standard exceedance days	35	0	2	1	2	0
Federal Annual Average, µg/m^3	12.0	8.0	10.7	10.7	8.7	6.5
Exceedance?		No	No	No	No	No

TABLE 3.9-1: AIR POLLUTANT SUMMARY FOR NOVATO SD AND MMWD SERVICE AREAS (CONTINUED)

Pollutant	Standard	2012	2013	2014	2015	2016
Nitrogen Dioxide (NO_2)						
Highest 1-hr average, ppm		0.052	0.050	0.062	0.044	0.046
Number of State standard exceedance days, ppm	0.18	0	0	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0	0	0
State Annual Average, ppm	0.030	0.011	0.012	0.011	0.010	0.009
Exceedance?		No	No	No	No	No

NOTES: Underlined values indicate an excess of applicable standard. Data are from 4th Street Monitoring Station in San Rafael, California. ppm – parts per million; $\mu g/m^3$ – micrograms per cubic meter.

SOURCE: CARB, 2017.

TABLE 3.9-2: AIR POLLUTANT SUMMARY FOR THE AMERICAN CANYON, NAPA SD, AND SVCSD SERVICE AREAS

Pollutant	Standard	2012	2013	2014	2015	2016
Ozone (O_3)						
Highest 1-hr average, ppm		0.082	0.089	0.074	0.079	0.080
Number of State standard exceedance days	0.09	0	0	0	0	0
Highest 8-hr average, ppm		0.064	0.076	0.066	0.069	0.067
Number of State standard exceedance days	0.070	0	2	0	0	0
Number of federal standard exceedance days	0.070	0	1	0	0	0
Respirable Particulate Matter-10 Micron (PM_{10})						
Highest 24-hr average, $\mu g/m^3$		37.7	39.6	39.3	50.0	33.0
Estimated State standard exceedance days	50	0	0	0	0	0
Estimated federal standard exceedance days	150	0	0	0	0	0
State Annual Average, $\mu g/m^3$	20	16.1	18.7	15.8	18.7	*
Exceedance?		No	No	No	No	*
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)						
Highest 24-hr average, $\mu g/m^3$		24.2	35.8	29.9	38.2	24.3
Estimated federal standard exceedance days	35	*	1	0	1	0
Federal Annual Average, $\mu g/m^3$	12.0	*	11.7	11.9	10.7	8.6
Exceedance?		*	No	No	No	No
Nitrogen Dioxide (NO_2)						
Highest 1-hr average, ppm		0.050	0.043	0.046	0.043	0.039
Number of State standard exceedance days, ppm	0.18	0	0	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0	0	0
State Annual Average, ppm	0.030	0.007	0.009	0.007	0.007	0.007
Exceedance?		No	No	No	No	No

NOTES: Underlined values indicate an excess of the applicable standard. Data are from Jefferson Avenue Monitoring Station in Napa, California. ppm – parts per million; $\mu g/m^3$ – micrograms per cubic meter. * Indicates there was insufficient data available to determine the value.

SOURCE: CARB, 2017.

TABLE 3.9-3: AIR POLLUTANT SUMMARY FOR CITY OF PETALUMA SERVICE AREA

Pollutant	Standard	2014	2015	2016
Ozone (O_3)				
Highest 1-hr average, ppm		0.067	0.068	0.073
Number of State standard exceedance days	0.09	0	0	0
Highest 8-hr average, ppm		0.061	0.062	0.064
Number of federal standard exceedance days	0.070	0	0	0
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)				
Highest 24-hr average, µg/m^3		26.2	29.9	18.7
Estimated federal standard exceedance days	35	0	0	0
Federal Annual Average, µg/m^3	12.0	7.7	6.8	4.9
Exceedance?		No	No	No
Nitrogen Dioxide (NO_2)				
Highest 1-hr average, ppm		0.044	0.037	0.032
Number of State standard exceedance days, ppm	0.18	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0
State Annual Average, ppm	0.030	0.004	0.004	0.004
Exceedance?		No	No	No

NOTES: Data are from Morris Street Station in Sebastopol; ppm – parts per million; µg/m^3 – micrograms per cubic meter.

SOURCE: CARB, 2017.

3.9.1.2 Toxic Air Contaminants

Toxic Air Contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including Diesel Particulate Matter (DPM) emissions from diesel-fueled engines (CARB, 2011). DPM is a complex mixture of solid air pollutants, the majority of which are small enough to be inhaled into the lungs. Most inhaled particles are subsequently exhaled, but some deposit on the lung surface. Although particles the size of DPM can deposit throughout the lung, the largest fraction deposits in the deepest regions of the lungs where the lung is most susceptible to injury.

3.9.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Air Quality issues and used to determine the significant criteria present in Section 3.9.3.1 is found in **Appendix 3.9A**.

3.9.3 Direct and Indirect Effects

3.9.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant effect on the environment with respect to air quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under a federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
4. Expose sensitive receptors to substantial pollutant concentrations;
5. Create objectionable odors affecting a substantial number of people; or

6. Conflict with the State goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, California Global Warming Solutions Act of 2006.

Criteria Pollutant Emissions Thresholds. For analyzing short-term construction and long-term operational emissions under CEQA, the BAAQMD has established quantitative significance thresholds of 54 pounds per day for ROG, NO_x, and $PM_{2.5}$, and 82 pounds per day for PM_{10}. For construction emissions, the PM_{10} and $PM_{2.5}$ significance thresholds should be compared to exhaust emissions only. With regard to the assessment of construction-related fugitive dust, the BAAQMD emphasizes implementation of its recommended dust control measures rather than a quantitative comparison of estimated emissions to a significance threshold. The BAAQMD also has established annual significance thresholds of 10 tons per year for ROG, NO_x, and $PM_{2.5}$, and 15 tons per year for PM_{10} exclusively for long-term operational emissions. The Phase 2 Program would be considered to result in a significant impact on air quality under CEQA if its project-level components would generate pollution emissions in excess of the daily or annual significance thresholds (BAAQMD, 2017a).

Toxic Air Contaminants. Any project that would have the potential to expose sensitive receptors to substantial levels of toxic air contaminants that would result in an incremental cancer risk of 10.0 in one million or greater, a hazard index of 1.0 or greater, or an increase in ambient $PM_{2.5}$ concentrations of 0.3 $\mu g/m^3$ or greater annual average would be considered to have a significant impact to sensitive receptors (BAAQMD, 2017a).

Odors. For odors, BAAQMD recommends that potential impacts be evaluated if a potential source of objectionable odors is proposed at a location near existing sensitive receptors or if sensitive receptors are proposed to be located near an existing source of objectionable odors. It is recommended that wastewater treatment plants not be sited within 1 mile of sensitive receptors (BAAQMD, 2017a). The NBWRP Phase 2 components would involve existing wastewater treatment plants, but would not include any new sources of odors. Therefore, the NBWRP Phase 2 would not create objectionable odors that would affect a substantial number of sensitive receptors. No impact would occur; therefore, this issue is not discussed further in this document.

3.9.3.2 Approach to Analysis under NEPA

For the purposes of the NEPA review, the lead agency must establish the NBWRP Phase 2's applicability to the General Conformity Rule, to determine if it would be in compliance with all NAAQSs and the SIP. According to 40 CFR 93.153, conformity determinations are required only for federal actions that occur in nonattainment or maintenance areas and result in generation of emissions that exceed established de minimis levels that are based on the specific classification of non-attainment status. The federal de minimis emissions thresholds applicable to the NBWRP Phase 2 for NO_x, ROG, CO, and $PM_{2.5}$ are 100 tons per year (USEPA, 2017).

Other air quality concerns unique to NEPA are related to whether the project would be subject to New Source Review and if the project would affect an area designated as Class I under the federal CAA.

3.9.3.3 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within member agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.9.1: Construction of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could exceed air quality standards or contribute substantially to an existing or projected air quality violation. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be no CEQA impact under the No Project Alternative.

Under the No Action Alternative, the Turnout to Wetlands (Novato SD) and the Urban Recycled Water Expansion (Petaluma) construction could overlap in 2020, the Marin County Lower Novato Creek Project 1 – Distribution (Novato SD) and the Urban Recycled Water Expansion could overlap in 2022, and the first phase of American Canyon's Recycled Water Distribution System Expansion and the Urban Recycled Water Expansion could overlap in 2018. Total construction emissions during any given year associated with NBWRP Phase 2 would be substantially less than those shown in **Table 3.9-6**, and would not exceed any significance criteria or General Conformity de minimis levels. Therefore, construction-related effects of the No Action Alternative would not be adverse under NEPA.

Proposed Action

Construction activities conducted under the NBWRP Phase 2 would involve the use of a variety of off-road diesel-fueled equipment, including graders, cranes, excavators, loaders, etc., that would emit exhaust containing air pollutants at the construction sites. In addition, construction trucks and workers' vehicles would generate exhaust emissions offsite, and fugitive dust would be generated by onsite ground disturbing and material handling activities. The project-level analysis of NBWRP Phase 2 includes quantification of emission estimates for comparison to BAAQMD significance thresholds and General Conformity de minimis levels. The NO_x significance threshold and de minimis level represents emissions of all oxides of nitrogen, including NO_2. Given the low ambient levels of SO_2 and lead in the Air Basin, short-term construction-related SO_2 and lead emissions associated with the NBWRP Phase 2 are not expected to result in significant effects and were not calculated. The other program elements are currently at a conceptual level with incomplete design plans. These projects are evaluated qualitatively with a program-level of analysis.

Exhaust Emission Estimates

Average daily emissions associated with construction of NBWRP Phase 2 projects that could occur simultaneously were combined to determine the "worst-case" scenario for average daily and maximum annual emissions. The worst-case daily and annual emissions scenarios are estimated to occur in 2020 and include simultaneous construction of the following components of NBWRP Phase 2:

1. Turnout to Wetlands;
2. Napa Road Pipeline;
3. Urban Recycled Water Expansion;
4. Agricultural Recycled Water Expansion – Phases 1 and 2;
5. Soscol WRF Covered Storage;
6. San Quentin Prison Recycled Water Distribution System; and
7. Recycled Water Distribution Expansion Phase 2.

For off-road equipment, emissions were estimated using the California Emissions Estimator Model version 2016.3.1 (CalEEMod v2016.3.1), with assumptions for construction equipment inventories, equipment horsepower ratings, and construction phasing developed by the NBWRA and the Reclamation for this EIR/EIS analysis. Emission factors for on-road trucks and worker vehicles were derived using CARB's EMFAC2014 Burden Model.

To compare the estimated NBWRP Phase 2 construction emissions to the BAAQMD significance thresholds, the emissions must be exhaust only (i.e., no fugitive dust) and in an average daily format. It is assumed that each piece of equipment associated with construction of the NBWRP Phase 2 projects would operate six to eight hours per day for varying amounts of days depending on the type of construction activity as well as the schedule for the associated project. Average hours per day for each equipment type were estimated by dividing the total work hours for the equipment types, by the total workdays required to construct the given project. It is assumed that each project under the NBWRP Phase 2 would result in an average of 18 to 24 one-way worker trips per day, and between two and 18 one-way heavy truck trips per day depending on project type. A summary of the estimated maximum average daily construction emissions delineated by member agency that would be associated with the NBWRP Phase 2 projects during the maximum emissions year (2020) is presented in **Table 3.9-4**. Refer to **Appendix 3.9C** for the calculation sheets that were used to estimate the maximum daily average emissions that would be associated with construction of the proposed NBWRP Phase 2.

As shown in **Table 3.9-4**, average daily construction equipment and vehicle exhaust emissions for projects of each of the individual water agencies would not exceed any of the significance thresholds; however, when emissions for all of the agencies are combined, emissions of NO_x would be approximately 199 pounds per day, which would exceed the BAAQMD's significance threshold of 54 pounds per day, resulting in a significant impact with respect to the potential to cause a violation of an ozone and/or NO_2 air quality standard, or contribute substantially to an existing or projected violation an ozone and/or NO_2 air quality standard. Emissions of ROG, PM_{10}, and $PM_{2.5}$ would not exceed the BAAQMD's respective significance criteria; therefore, impacts associated with these pollutants would be less than significant.

In addition to exhaust emissions, emissions of fugitive dust would also be generated by construction activities associated with grading, earth disturbance, etc. With regard to fugitive dust emissions, the BAAQMD Guidelines focus on implementation of recommended dust control measures rather than a quantitative comparison of estimated emissions to a significance threshold. For all projects, the BAAQMD recommends the implementation of its *Basic Control Mitigation Measures*. Therefore, implementation of the

TABLE 3.9-4: ESTIMATED MAXIMUM DAILY AVERAGE CONSTRUCTION EXHAUST EMISSIONS (POUNDS/DAY)

Project Component	Average Daily Emission Estimates (pounds per day)				
	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato SD					
Turnout to Wetlands	1.86	23.01	15.10	0.88	0.83
Subtotal	*1.86*	*23.01*	*15.10*	*0.88*	*0.83*
SVCSD					
Napa Road Pipeline	2.40	25.20	20.46	1.16	1.10
Subtotal	*2.40*	*25.20*	*20.46*	*1.16*	*1.10*
City of Petaluma					
Urban Recycled Water Expansion	2.41	25.28	20.52	1.17	1.10
Agricultural Recycled Water Expansion – Phases 1 and 2	2.35	24.97	19.98	1.13	1.07
Subtotal	*4.76*	*50.25*	*40.50*	*2.30*	*2.17*
Napa SD					
Soscol WRF Covered Storage	1.41	14.58	10.49	0.64	0.60
Soscol WRF Covered Storage - Pipeline	2.30	24.30	19.68	1.12	1.06
Subtotal	*3.71*	*38.89*	*30.17*	*1.76*	*1.66*
MMWD					
San Quentin Prison Recycled Water Distribution System	0.88	9.61	6.58	0.42	0.40
San Quentin Prison Recycled Water Distribution System - Pipeline	2.38	24.65	20.40	1.16	1.09
Subtotal	*3.27*	*34.26*	*26.98*	*1.58*	*1.50*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	2.58	27.22	21.85	1.24	1.17
Subtotal	*2.58*	*27.22*	*21.85*	*1.24*	*1.17*
Grand Total	**18.59**	**198.84**	**155.07**	**8.92**	**8.42**
BAAQMD Significance Thresholds	54	54	--	82	54
Significant Impact?	No	Yes	No	No	No

SOURCE: ESA, 2017. See **Appendix 3.9C**.

BAAQMD's fugitive dust Basic Control Measures, which are contained in **Mitigation Measure 3.9.1-1a**, would reduce impacts associated with fugitive dust emissions to a less-than-significant level. The BAAQMD recommends that projects with estimated emissions that exceed one or more of the significance thresholds implement additional control measures consistent with those listed under **Mitigation Measure 3.9.1-1b**.

Mitigation Measures

Mitigation Measure 3.9.1-1a: BAAQMD Basic Construction Measures.

To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended Basic Construction Measures shall be implemented and included in all contract specifications for projects constructed under the Phase 2 Program:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and persons to contact at the North Bay Water Reuse Authority and/or the applicable member agency regarding dust complaints. These persons shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Mitigation Measure 3.9.1-1b: Additional Construction Mitigation Measures.

The North Bay Water Reuse Authority and/or applicable member agency shall implement all feasible measures from the BAAQMD's Additional Construction Mitigation Measures listed below:

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12-inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
9. Minimize the idling time of diesel powered construction equipment to 2 minutes.
10. The off-road diesel-powered equipment (more than 50 horsepower) to be used in the construction of any project (i.e., owned, leased, and subcontractor vehicles) under the Phase 2 Program shall be equipped with engines that achieve USEPA Tier 4 emissions standards.
11. Use low volatile organic compound (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NO_x and PM_{10}.

It should be noted that in lieu of BAAQMD measures for off-road construction equipment that require preparation of a plan to manage emissions, etc., **Mitigation Measure 3.9.1-1b** applies a straight-forward approach of simply requiring all off-road diesel-powered equipment (more than 50 horsepower) used under the NBWRP Phase 2 to be equipped with engines that achieve USEPA Tier 4 emissions standards. **Table 3.9-5** presents a summary of the estimated maximum average daily construction emissions with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**. Refer to **Appendix 3.9D** for the calculation sheets that show all assumptions used to estimate the mitigated maximum daily average emissions that would be associated with construction of the proposed Phase 2 Program.

As shown in **Table 3.9-5**, maximum average daily construction exhaust emissions of NO_x would be mitigated to approximately 38 pounds per day, which would be less than the BAAQMD's significance threshold of 54 pounds per day. Therefore, the significant impact with respect to the potential to cause a violation of an ozone and/or NO_2 air quality standard, or contribute substantially to an existing or projected violation of an ozone and/or NO_2 air quality standard, would be reduced to **less than significant with mitigation** incorporated.

Significance after Mitigation: Less than Significant.

TABLE 3.9-5: ESTIMATED MITIGATED MAXIMUM DAILY AVERAGE CONSTRUCTION EMISSIONS (POUNDS/DAY)

Project Component	Average Daily Emission Estimates (pounds per day)				
	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato SD					
Turnout to Wetlands	0.49	7.59	17.79	0.03	0.03
Subtotal	*0.49*	*7.59*	*17.79*	*0.03*	*0.03*
SVCSD					
Napa Road Pipeline	0.53	4.52	24.12	0.02	0.02
Subtotal	*0.53*	*4.52*	*24.12*	*0.02*	*0.02*
City of Petaluma					
Urban Recycled Water Expansion	0.53	4.53	24.21	0.02	0.02
Agricultural Recycled Water Expansion – Phases 1 and 2	0.53	5.00	23.43	0.02	0.02
Subtotal	*1.06*	*9.53*	*47.64*	*0.04*	*0.04*
Napa SD					
Soscol WRF Covered Storage	0.28	1.74	12.28	0.01	0.01
Soscol WRF Covered Storage - Pipeline	0.51	4.69	23.01	0.02	0.02
Subtotal	*0.79*	*6.43*	*35.29*	*0.03*	*0.03*
MMWD					
San Quentin Prison Recycled Water Distribution System	0.17	1.42	7.65	0.00	0.00
San Quentin Prison Recycled Water Distribution System - Pipeline	0.51	3.97	24.06	0.02	0.01
Subtotal	*0.69*	*5.39*	*31.71*	*0.02*	*0.02*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	0.57	4.71	26.11	0.02	0.02
Subtotal	*0.57*	*4.71*	*26.11*	*0.02*	*0.02*
Grand Total	**4.14**	**38.18**	**182.67**	**0.16**	**0.15**
BAAQMD Significance Thresholds	54	54	--	82	54
Significant Impact?	No	No	No	No	No

SOURCE: ESA, 2017. See **Appendix 3.9D**.

NEPA Review

Under amendments to the federal CAA, the USEPA has classified air basins or portions thereof as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The Air Basin is currently designated as a nonattainment area for the national ozone and $PM_{2.5}$ (24-hour) standards. The General Conformity Rule ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state's plans to meet national standards for air quality. Under the existing regulations, de minimis emission levels are listed for each criteria pollutant in units of tons per calendar year.

In creating the de minimis emission levels, USEPA sought to limit the need to conduct conformity determinations for actions with minimal emission increases. When the total direct and indirect emissions from a project are below the de minimis levels, the project would not be subject to a conformity determination (USEPA, 2017) and it can be assumed that the project would not result in a violation of a federal ambient air quality standard. 40 CFR 93.153 defines de minimis levels as the minimum threshold for which a conformity determination must be performed for various criteria pollutants in various areas. With respect to the Air Basin, the applicable de minimis levels are 100 tons/year (tpy) for ROG, CO, NO_x, and $PM_{2.5}$.[1] Since the Air Basin is attainment for PM_{10} federal ambient air quality standards, the de minimis level does not apply (USEPA, 2017).

For comparison to the applicable de minimis levels, annual tons of construction-related emissions were estimated for worst-case year 2020, which would include overlapping construction of the NBWRP Phase 2 components described above under *Exhaust Emissions Estimates*. ROG off-gassing that would be associated with Project-related asphalt paving activities was estimated using the CalEEMod emission factor of 2.62 pounds ROG per acre paved per day (CAPCOA, 2013). In addition to exhaust and off-gassing emissions, construction-related fugitive dust in the form of PM_{10} and $PM_{2.5}$ were estimated for the NEPA analysis.

1 The Air Basin is in attainment for CO but still designated as a maintenance area; thus, the de minimis level applies.

Emission factors and methods obtained from CARB and the CalEEMod emissions model were used to calculate fugitive dust emissions during the maximum year (i.e., 2020) of Phase 2 Program construction activities.

Maximum annual fugitive dust emissions were evaluated for the following activities: general site preparation and earthmoving on a total of 2.75 acres associated with the RWF Treatment Capacity Expansion, Turnout to Wetlands, San Quentin Prison Recycled Water Distribution System, Soscol SWR Covered Storage, Soscol WRF Increased Filter Capacity, Increase Ellis Creek WRF Capacity, and the WRF Phase 2 Treatment Plant Upgrades projects; as well as for approximately 83,000 cubic yards of soil handling associated with trenching and jack and bore pit excavations for 10 proposed NBWRP Phase 2 pipelines. For general site preparation and earth-moving activities, an emission rate of 20 pounds of PM_{10} per acre graded per day was used (CARB, 2002). Fugitive dust that would be associated with pipeline trench and jack and bore pit excavation activities was estimated using emission factors of 0.001 pound PM_{10} and 0.0002 pound $PM_{2.5}$ per cubic yard material handled based on the truck loading emission factor formula used by CalEEMod (CAPCOA, 2013). $PM_{2.5}$ fractions for soil disturbance activities developed by the South Coast Air Quality Management District (SCAQMD) were used to estimate $PM_{2.5}$ fugitive dust emissions that would be associated with site preparation activities (SCAQMD, 2006).

A summary of the estimated maximum annual construction emissions delineated by member agency that would be associated with the NBWRP Phase 2 projects during the maximum emissions year (2020) is presented in **Table 3.9-6**. Refer to **Appendix 3.9C** for the calculation sheets that were used to estimate the maximum annual emissions that would be associated with construction of the proposed NBWRP Phase 2.

As shown in **Table 3.9-6**, maximum annual construction emissions would be well below the applicable USEPA de minimis levels. Therefore, the construction activities under the Phase 2 Program would not be expected to contribute substantially to an existing or projected violation of a federal ambient air quality standard. In addition, implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b** would reduce the emissions presented in **Table 3.9-6** substantially. Construction-related effects of the NBWRP Phase 2 would not be adverse under NEPA.

TABLE 3.9-6: ESTIMATED MAXIMUM ANNUAL CONSTRUCTION EMISSIONS (TONS/YEAR)

Project Component	Maximum Annual Emission Estimates (tons/year)				
	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato SD					
Turnout to Wetlands	0.01	0.11	0.08	0.03	0.01
Subtotal	*0.01*	*0.11*	*0.08*	*0.03*	*0.01*
SVCSD					
Napa Road Pipeline	0.13	1.45	1.18	0.08	0.06
Subtotal	*0.13*	*1.45*	*1.18*	*0.08*	*0.06*
City of Petaluma					
Urban Recycled Water Expansion	0.32	3.29	2.68	0.17	0.15
Agricultural Recycled Water Expansion – Phases 1 and 2	0.22	2.24	1.77	0.12	0.10
Subtotal	*0.53*	*5.53*	*4.45*	*0.30*	*0.24*
Napa SD					
Soscol WRF Covered Storage	0.12	1.23	0.88	0.11	0.06
Soscol WRF Covered Storage - Pipeline	0.01	0.07	0.06	0.00	0.00
Subtotal	*0.13*	*1.31*	*0.94*	*0.11*	*0.06*
MMWD					
San Quentin Prison Recycled Water Distribution System	0.05	0.61	0.42	0.08	0.04
San Quentin Prison Recycled Water Distribution System - Pipeline	0.01	0.15	0.13	0.01	0.01
Subtotal	*0.06*	*0.76*	*0.55*	*0.10*	*0.05*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	0.13	1.44	1.14	0.08	0.06
Subtotal	*0.13*	*1.44*	*1.14*	*0.08*	*0.06*
Grand Total	**1.00**	**10.60**	**8.34**	**0.69**	**0.49**
USEPA De Minimis Level	100	100	100	--	100
General Conformity Determination Needed?	No	No	No	No	No

SOURCE: ESA, 2017. See **Appendix 3.9C**.

The NBWRP Phase 2 would not affect any area designated as Class I under the Clean Air Act because long-term emissions associated with the project would be less than significant and the nearest Class I area is the Point Reyes Wilderness Area, located approximately 10 miles west of the Phase 2 Program area.

Program Elements

Six additional projects are evaluated at a program elements level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA. The exact timeframe of when these projects would be constructed is currently unknown; however, the average daily and maximum annual construction emissions would be expected to be similar to the emissions disclosed for the individual NBWRP Phase 2 components shown in **Tables 3.9-5** through **3.9-7**. Depending on the phasing of the Program-level projects, the CEQA impact would likely be significant, but reduced to less than significant with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**, and the environmental effect under NEPA would not be adverse.

Storage Alternative

Table 3.9-7 summarizes the construction criteria pollutant emissions effects of the Storage Alternative by member agency and component type. Combined emissions of the Proposed Action and the Storage Alternative would exceed the NO_x significance threshold resulting in a CEQA significant impact. Depending on the phasing of the Storage Alternative components, NO_x emissions could exceed the significance threshold even with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**, which would result in a **significant unavoidable** impact. With respect to NEPA, combined emissions of the Proposed Action and emissions associated with the Storage Alternative would not be expected to exceed the General Conformity *de minimis* levels and the environmental effect would not be adverse.

TABLE 3.9-7: STORAGE ALTERNATIVE CONSTRUCTION EFFECTS RELATED TO POTENTIAL AIR QUALITY STANDARD VIOLATIONS

Storage Alternative Component	Water Agency	Effects by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Same as the proposed RWF Treatment Capacity Expansion, these alternative upgrades would be expected to occur in 2022 (or after), which would have no effect on peak-year (2020) construction emissions associated with the Storage Alternative shown in **Tables 3.9-4** through **3.9-6**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	Depending on the timing for implementation of the alternative pipeline components, the maximum average daily and maximum annual construction emissions, which would be similar to the emissions generated by the proposed NBWRP Phase 2 pipeline projects, could contribute to the peak emissions generated by the Storage Alternative.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Depending on the timing for implementation of the seasonal storage alternative components, their maximum average daily and maximum annual construction emissions, which would be similar to the emissions generated by the proposed NBWRP Phase 2 projects, could contribute to peak emissions generated by the Storage Alternative.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Napa SD	
SVCSD Seasonal Storage - Mulas	SVCSD	

Impact 3.9.2: Operations of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could contribute to an existing or projected air quality violation. (Less than Significant)

No Project/No Action Alternative

There would be no CEQA impact under the No Project Alternative.

Routine operations of the projects under the No Action Alternative scenario would not result in long-term emissions. Therefore, the No Action Alternative would have no adverse effects under NEPA.

Proposed Action

Routine operation of the NBWRP Phase 2 projects would rely on electrical power supplied from Pacific Gas and Electric Company (PG&E)'s existing regional power grid. It is generally not possible to determine the exact generation source(s) of electricity on the power grid that would supply the projects under the NBWRP Phase 2, or whether or not the electricity would

even be generated within the Air Basin. Therefore, indirect emissions of criteria pollutants associated with electricity use from the regional power grid are not addressed in this air quality analysis because it would be impractical/impossible to do so with any certainty.

The only operational emission sources that would be associated with the NBWRP Phase 2 would be stand-by emergency diesel generators that would be installed associated with the plant capacity increase and pump station components to provide emergency back-up power. Securing permits from the BAAQMD for the emergency standby generators would ensure less-than-significant operational impacts related to the use of such generators through adherence to BAAQMD Best Available Control Technology (BACT) guidance and Regulation 9-8-330 (BAAQMD 2015). Estimated maximum annual emissions that would be associated with emergency generator testing are presented in **Table 3.9-8**. Refer to **Appendix 3.9D** for the calculation sheets that were used to estimate the operational emissions that would be associated with the proposed NBWRP Phase 2.

As identified in **Table 3.9-8**, combined operational emissions that would be associated with the projects under the NBWRP Phase 2 would not exceed any of the significance thresholds; therefore, operational emissions would not be expected to result in or contribute to an exceedance of an ambient air quality standard and the associated impact would be **less than significant**.

TABLE 3.9-8: MAXIMUM ANNUAL EMERGENCY GENERATOR EMISSION ESTIMATES

Member Agency - Project	Maximum Annual (tons/year)				
	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Novato SD - RWF Treatment Capacity Expansion	0.00	0.01	0.01	0.00	0.00
City of Petaluma - Ellis Creek WRF Increased Capacity	0.00	0.04	0.03	0.00	0.00
Napa SD - Soscol WRF Increased Filter Capacity	0.00	0.02	0.02	0.00	0.00
MMWD – San Quentin Prison Recycled Water Distribution System	0.00	0.00	0.01	0.00	0.00
City of American Canyon - WRF Phase 2 Treatment Plant Upgrades	0.00	0.01	0.01	0.00	0.00
Total	**0.00**	**0.08**	**0.09**	**0.00**	**0.00**
BAAQMD Significance Thresholds	10	10	---	15	10
Significant Impact?	No	No	No	No	No

NOTES: It is assumed that each diesel generator would meet BAAQMD BACT emissions requirements and would be tested approximately 50 hours per year (4.2 hours per test, 12 tests per year) pursuant to BAAQMD Regulation 9-8-330.

SOURCE: ESA, 2017. See **Appendix 3.9D**.

Mitigation Measures

None required.

NEPA Review

As shown in **Table 3.9-8**, maximum annual operational emissions would be well below the applicable USEPA de minimis levels (i.e., 100 tons) for ROG, NO_x, CO, and $PM_{2.5}$. Therefore, the long-term operation and maintenance activities under the NBWRP Phase 2 would not be expected to contribute substantially to an existing or projected violation of a federal ambient air quality standard. The effect on ambient air quality would not be considered adverse under NEPA.

In addition, the NBWRP Phase 2 would not affect any area designated as Class I under the federal CAA because long-term emissions associated with the projects under the NBWRP Phase 2 would not be adverse and the nearest Class I area is the Point Reyes Wilderness Area, located approximately 10 miles west of the NBWRP Phase 2 area. Further, the proposed actions under the NBWRP Phase 2 would not be subject to New Source performance standards. Long-term effects of the NBWRP Phase 2 projects on air quality and visibility would not be adverse under NEPA.

Program Elements

Six additional projects are evaluated at a program level because they are currently at a conceptual level and will not be implemented until additional design and funding become available. Three of the projects (seasonal storage for Novato SD and two aquifer storage projects in City of Sonoma for the SCWA) would require pump stations that may require emergency backup generators. The size and use parameters of the pump stations and associated emergency generators are currently unknown; however, their annual operational emissions would be expected to be similar to the emissions disclosed for the individual components of NBWRP Phase 2 shown in **Table 3.9-8**. The CEQA impact would be less than significant and the environmental effect under NEPA would not be adverse.

Storage Alternative

Table 3.9-9 identifies the effects of the Storage Alternative by member agency and component type. The Novato SD RWF and the Novato SD, SVCSD, and Napa SD storage projects may require emergency generators to power facilities in the event of a power outage. Periodic testing of the emergency generators would result in emissions similar to those shown in **Table 3.9-8**. The CEQA impact would be less than significant and there would be no adverse effects under NEPA.

TABLE 3.9-9: STORAGE ALTERNATIVE OPERATIONAL EFFECTS RELATED TO POTENTIAL AIR QUALITY STANDARD VIOLATIONS

Storage Alternative Component	Water Agency	Effects by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	It is assumed that this alternative component would require an emergency generator approximately the same size as the proposed Novato SD RWF, which would result in negligible emissions increases compared to those shown in **Table 3.9-7**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	The alternative pipeline components would result in no long-term emissions.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	The Napa SD, SVCSD, and Napa SD storage projects would include pump stations that may require emergency generators. Testing of the emergency generators would result in emissions similar to those shown in **Table 3.9-7**.
SVCSD Seasonal Storage - Mulas	SVCSD	
Napa SD Jameson Ranch	Napa SD	
Petaluma – Ellis Creek WRF Southeast	Petaluma	The Ellis Creek WRF Southeast project would result in no long-term emissions.

Impact 3.9.3: Construction of the NBWRP Phase 2 projects would result in emissions that could conflict with the 2017 Clean Air Plan. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be no CEQA impact under the No Project Alternative.

Under the No Action Alternative, routine operations of these projects would not result in long-term emissions.

Proposed Action

The Air Basin is currently designated as a nonattainment area for state and federal ozone standards, state particulate matter (both PM_{10} and $PM_{2.5}$) standards, and the federal $PM_{2.5}$ (24-hour) standard. The BAAQMD's 2017 Clean Air Plan – Spare the Air, Cool the Climate (2017 CAP) is the applicable air quality plan that has been prepared to address ozone and particulate matter nonattainment as well as other issues, such as TAC and GHG emissions (BAAQMD, 2017c). The 2017 Clean Air Plan updates the BAAQMD's 2010 Clean Air Plan to comply with State air quality planning requirements.

The BAAQMD CEQA Guidelines recommends that a project's consistency with the current air quality plan should be evaluated using the following three criteria: does the project (in this case, the Phase 2 Program) support the goals of the air quality plan; does the project include applicable control measures from the air quality plan; and would the project not disrupt or hinder implementation of any control measures from the air quality plan? If it can be concluded with substantial evidence that the answers to the three criteria are in the affirmative, then the BAAQMD considers the project to be consistent with air quality plans prepared for the Air Basin.

The primary goals of the 2017 Clean Air Plan are to attain air quality standards, reduce population exposure, and protect public health in the Air Basin, and reduce GHG emissions and protect the climate. The BAAQMD-recommended gauge for determining if a project supports the goals in the current clean air plan is consistency with BAAQMD thresholds of significance. If projects under the Phase 2 Program would generate emissions that would not exceed the thresholds of significance after the application of all feasible mitigation measures, the Phase 2 Program would be consistent with the goals of the 2017 CAP. As indicated in the discussion under Impact 3.9.1, the Phase 2 Program would result in pollutant emissions during construction that would be less than the BAAQMD significance thresholds with the implementation of **Mitigation Measures 3.9.1-1a and 3.9.1-1b**; and as indicated in the discussion under Impact 3.9.2, the Phase 2 Program would result in pollutant emissions during operations that would be less than the BAAQMD significance thresholds. Therefore, the Phase 2 Program would be considered to support the primary goals of the 2017 CAP.

The 2017 CAP contains 85 control measures aimed at reducing air pollution in the Air Basin. Projects that incorporate all feasible air quality plan control measures are considered consistent with the 2017 CAP. The 2017 CAP contains two measures specific to water. The measures are referred to as Water Control Measures WR1, *Limit Greenhouse Gases (GHGs) from Publically Owned Treatment Works*, and WR2, *Support Water Conservation*. The intent of these control measures is to reduce criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from water treatment plants, and promoting the use of biogas recovery systems. The proposed actions under the Phase 2 Program would expand the use of recycled water in the North Bay region at facilities that currently rely on potable water, thereby promoting the conservation of limited surface water and groundwater resources. Under NBWRP Phase 2, the Phase 2 Program would provide opportunities to deliver recycled water and integrated water management systems in the North Bay region by providing increased recycled water supply to urban, agricultural, and environmental uses. Therefore, no inconsistency with the 2017 CAP has been identified. The Phase 2 Program would not hinder implementation of any of the 2017 CAP control measures.

In summary, the Phase 2 Program overall would not be considered to conflict with the 2017 CAP with implementation of mitigation. This impact would be mitigated to a less-than-significant level through **Mitigation Measure 3.9.1-1a** and **3.9.1-1b**.

Program Elements

The exact timeframe of when the Program Elements would be constructed is currently unknown; however, the average daily and maximum annual construction emissions would be expected to be similar to the emissions disclosed for the individual components of NBWRP Phase 2 shown in **Tables 3.9-4** through **3.9-6** and **Table 3.9-8**. Depending on the phasing of the Program Elements, the CEQA impact would be significant, but reduced to less than significant with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**, and the environmental effect under NEPA would not be adverse. Therefore, the Program Elements would be considered to support the primary goals of the 2017 CAP. Under NBWRP Phase 2, the Program Elements would provide opportunities to deliver recycled water and integrated water management systems in the North Bay region by providing increased recycled water supply to urban, agricultural, and environmental uses. Therefore, no inconsistency with the 2017 CAP has been identified. The Program Elements would not hinder implementation of any of the 2017 CAP control measures. This impact would be mitigated to **less than significant**.

Storage Alternative

The Proposed Action combined with the Storage Alternative would exceed the NO_x significance threshold resulting in a CEQA significant impact. Depending on the phasing of the Storage Alternative components, NO_x emissions could exceed the significance threshold even with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**, which would result in a significant unavoidable impact. Therefore, the Storage Alternative would not support the primary goals of the 2017 CAP and the associated potential impact would be **significant and unavoidable.**

Mitigation Measures

Implement **Mitigation Measure 3.9.1-1a** and **3.9.1-1b**.

Impact Significance after Mitigation: Less than Significant. Impacts for the Storage Alternative would be Significant and Unavoidable.

Impact 3.9.4: Construction of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be no CEQA impact under the No Project Alternative.

None of the No Action Alternative scenario projects would involve construction activities lasting longer than 2 months within 1,000 feet of any given sensitive receptor. Therefore, applying OEHHA guidance, activities conducted under the No Action Alternative would not exceed the BAAQMD's TAC significance thresholds (i.e., the proposed actions would not result in a hazard index greater than 1 for acute or chronic impacts and/or cancer risk greater than 10 incidents per 1,000,000 population) and would not result in adverse effects under NEPA related to exposure of sensitive receptors to DPM.

Proposed Action

Construction activities associated with the actions proposed under the Phase 2 Program would result in the short-term generation of DPM emissions from the use of off-road diesel equipment, and from construction material deliveries and debris/spoils removal using on-road heavy-duty trucks. As discussed previously, DPM is a complex mixture of chemicals and particulate matter that has been identified by the State of California as a TAC with potential cancer and chronic non-cancer effects. The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance (or substances)

in the environment and the duration of exposure to the substance. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments (HRAs), which determine the lifetime exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period when assessing TACs (such as DPM) that have only cancer or chronic non-cancer health effects. However, for short term activities such as construction, such HRAs should be limited to the duration of the emission-producing activities associated with the project, unless the activities occur for less than 6 months. Activities that would last more than 2 months, but less than 6 months, are recommended to be evaluated as if they would last for 6 months. OEHHA does not recommend conducting health risk assessments for projects that would last less than 2 months (OEHHA, 2015).

Construction activities associated with each of the individual projects under the Phase 2 Program would take place over periods that may range from a few months to several years. The BAAQMD has identified a distance of 1,000 feet from the source to the closest sensitive receptor locations within which community health risk thresholds would be applicable to gauge the significance of health risk-related impacts. The BAAQMD and OEHHA consider projects that are estimated to result in a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0 to be a significant health risk (BAAQMD, 2017). Depending on the distance separating construction activities from the nearest sensitive receptors and the concentration of DPM emissions generated during construction of projects proposed under the Phase 2 Program, health risk impacts on sensitive receptors could be significant.

Construction of several projects under the proposed Phase 2 Program would occur in the vicinity (i.e., within 1,000 feet) of sensitive receptors for durations ranging from several days to more than a year. Pipeline construction activities would proceed linearly at rates that would average from 100 feet per day to 400 feet per day, which would limit the duration of exposure for any given receptor to less than 2 months. Therefore, applying OEHHA guidance, pipeline construction activities conducted under the Phase 2 Program would not exceed the BAAQMD's TAC significance thresholds (i.e., the proposed actions would not result in a hazard index greater than 1 for acute or chronic impacts and/or cancer risk greater than 10 incidents per 1,000,000 population) and would result in **less-than-significant impacts** related to exposure of sensitive receptors to DPM. The construction activities within 1,000 feet of sensitive receptors that would pose the highest health risks would be at the proposed treatment plant facilities and pump station sites because work at those sites would likely occur for several months to 2 years, which could result in an increase in nearby sensitive receptor exposure to DPM. Out of these Phase 2 Program projects, only Napa SD's Soscol WRF Increased Filter Capacity project would be constructed at a distance of over 1,000 feet from the nearest sensitive receptors. Applying BAAQMD's screening distance guidance, the Soscol WRF Increased Filter Capacity project would result in a **less-than-significant** health risk impact.

NBWRP Phase 2 would involve construction activities lasting longer than 2 months within 1,000 feet of any given sensitive receptor include the following: Novato SD's RWF Treatment Capacity Expansion at its WWTP (550 feet from closest residence); MMWD's proposed treatment facilities at the CMSA plant (900 feet from the closest living quarters), and City of Petaluma's Ellis Creek WRF Increased Capacity Project (450 feet from closest residence). Uncontrolled construction activities at these distances can result in moderate to high sensitive receptor exposure to DPM emissions, causing potentially significant health risk impacts. However, pursuant to implementation of **Mitigation Measure 3.9.1-1b** (see Impact 3.9.1, above), all off-road diesel-powered equipment (more than 50 horsepower) used for projects under the Phase 2 Program would be equipped with engines that achieve USEPA Tier 4 emissions standards. This would reduce uncontrolled project-related DPM emissions by approximately 99 percent, and would ensure that the potentially significant health risk impacts associated with construction of the RWF Treatment Capacity Expansion, the San Quentin Prison Recycled Water Distribution System, and the Ellis Creek WRF Increased Capacity projects would be reduced to **less than significant with mitigation**.

Program Elements

Similar to NBWRP Phase 2, all pipeline construction activities associated with the Program Elements would proceed at a rate of at least 100 feet per day, which would limit exposure to nearby sensitive receptors and result in **less-than-significant** health risk impacts. Novato SD's Option 1: Site Near Highway 37 (Tertiary) 150 AF site is not within 1,000 feet of a sensitive receptor site; therefore, consistent with BAAQMD guidance, construction of this facility would also result in a **less-than-significant** health risk impact.

The SCWA's Valley of the Moon ASR Pump Station and monitoring well sites are approximately 100 feet from the nearest residence and the SCWA's Sonoma ASR Pump Station and monitoring well sites are approximately 150 feet from the nearest residence, and there are several residences approximately 600 feet from Napa SD's Napa State Hospital Storage Tank project site. Uncontrolled construction activities associated with these Program Elements at these distances could result in moderate to high sensitive receptor exposure to DPM emissions, causing potentially significant health risk impacts. However, pursuant to implementation of **Mitigation Measure 3.9.1-1b** (see Impact 3.9.1, above), all off-road diesel-powered equipment (more than 50 horsepower) used would be equipped with engines that achieve USEPA Tier 4 emissions standards. This would ensure that the potentially significant health risk impacts associated with construction of the Valley of the Moon ASR Pump Station and monitoring well, the Valley of the Moon ASR Pump Station and monitoring well, and the Napa State Hospital Storage Tank projects would be reduced to **less than significant with mitigation**.

Storage Alternative

Table 3.9-10 identifies the construction effects of the Storage Alternative by member agency and component type relative to expose of sensitive receptors to TACs.

TABLE 3.9-10: STORAGE ALTERNATIVE EFFECTS OF SENSITIVE RECEPTOR EXPOSURE TO TOXIC AIR CONTAMINANTS DURING CONSTRUCTION

Storage Alternative Component	Water Agency	Effects by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Construction of the Novato SD RWF at its WWTP would occur within 550 feet of the closest residence and would last longer than 2 months. Applying OEHHA guidance, uncontrolled construction activities associated with this project could result in sensitive receptor exposure to DPM emissions causing potentially significant health risk impacts. However, pursuant to implementation of **Mitigation Measure 3.9.1**-1b (see **Impact 3.9.1**, above), all off-road diesel-powered equipment (more than 50 horsepower) would be equipped with engines that achieve USEPA Tier 4 emissions standards. This would ensure that the potentially significant health risk impacts would be reduced to less than significant with mitigation.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	Pipeline construction would not involve activities lasting longer than 2 months within 1,000 feet of any given sensitive receptor. Therefore, applying OEHHA guidance, the associated health risk would be less than significant.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Seasonal storage alternative construction conducted by Novato SD, Petaluma, and SVCSD would not involve activities within 1,000 feet of any given sensitive receptor. Therefore, applying OEHHA guidance, the associated health risk would be less than significant.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
SVCSD Seasonal Storage – Mulas Site	SVCSD	
Napa SD Jameson Ranch	Napa SD	Construction of the Napa SD Jameson Ranch seasonal storage project would occur within 50 feet of the closest residence and would last longer than 2 months. Applying OEHHA guidance, uncontrolled construction activities associated with this project could result in sensitive receptor exposure to DPM emissions causing potentially significant health risk impacts. However, pursuant to implementation of **Mitigation Measure 3.9.1-1b** (see Impact 3.9.1, above), all off-road diesel-powered equipment (more than 50 horsepower) would be equipped with engines that achieve USEPA Tier 4 emissions standards. This would ensure that the potentially significant health risk impacts would be reduced to less than significant with mitigation.

Mitigation Measures

Implement **Mitigation Measure 3.9.1-1b** (see **Impact 3.9.1** discussion, above).

Significance after Mitigation: Less than significant.

Impact 3.9.5: Operation of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions. (Less than Significant)

No Project/No Action Alternative

There would be no CEQA impact under the No Project Alternative.

Routine operations of projects in the No Action Alternative scenario would not result in long-term emissions of TACs, and there would be no increased health risk. No adverse effect would occur under NEPA.

Proposed Action

The only onsite DPM emissions sources that would be associated with operations of the NBWRP Phase 2 would be emergency generators at the project sites listed in **Table 3.9-8**. DPM emissions (in the form of PM_{10}) from routine testing and maintenance of all these emergency generators combined would be less than 0.01 ton per year. Given the negligible amount of emissions that would be generated, long-term operations of the emergency generators would not exceed the BAAQMD's TAC significance thresholds. Therefore, the increased health risk from long-term DPM emissions would be negligible and this impact would be **less than significant**.

Program Elements

It is assumed that SCWA's Valley of the Moon ASR Pump Station and monitoring well and Sonoma ASR Pump Station and monitoring well, as well as Napa SD's Napa State Hospital Storage Tank projects would require emergency generators and associated routine testing and maintenance. Similar to NBWRP Phase 2 (see above), the DPM emissions that would be associated with the Program Elements would negligible. The increased health risk from long-term DPM emissions would be negligible and this impact would be **less than significant**.

Storage Alternative

The only onsite DPM emissions sources that would be associated with operations of the Action Alternative and the Storage Alternative would be emergency generators at NBWRP Phase 2 sites listed in **Table 3.9-8** as well as the alternative Novato SD RWF, Napa SD, and SVCSD alternative storage projects. DPM emissions (in the form of PM_{10}) from routine testing and maintenance of all the emergency generators combined would be expected to be less than 0.01 ton per year. Given the negligible amount of emissions that would be generated, long-term operations of the emergency generators would not exceed the BAAQMD's TAC significance thresholds. Therefore, the increased health risk would be negligible and this impact under CEQA would be **less than significant**.

Mitigation Measures

None required.

Significance after Mitigation: Less than Significant.

3.9.3.4 Impact Summary by Service Area

Appendix 3.9B provides a summary of potential Project impacts per Member Agency related to air quality.

3.10 Greenhouse Gas Emissions

This section describes existing greenhouse gas (GHG) emissions and climate change-related conditions in the NBWRP Phase 2 area in Section 3.10.1, *Affected Environment*. Section 3.8.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources and considerations is presented in Appendix 3.10A. No comments or other input were received during the scoping period for this EIR/EIS regarding GHG emissions.

3.10.1 Affected Environment

3.10.1.1 Climate Change

According to the U.S. Environmental Protection Agency (USEPA), the term "climate change" refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (over several decades or longer). There is scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Gases that trap heat in the atmosphere are often called GHGs. Emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to increases in global temperatures. The potential effects of climate change in California include sea level rise and reductions in snowpack, as well as an increased number of extreme-heat days per year, high ozone days, large forest fires, and drought years (CARB, 2014). Globally, climate change could affect numerous environmental resources through potential, though uncertain, changes in future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the observed and/or projected effects of climate change vary regionally, but include the following direct effects (IPCC, 2014):

1. Changing precipitation and snow melt patterns;
2. Negative effect on crop yield;
3. Increased heat waves, drought, flood, wildfires, and storm events;
4. Reduced renewable water resources in most dry subtropical regions; and
5. Ocean acidification damage to marine ecosystems.

In addition, many secondary effects are projected to result from climate change, including a global rise in sea level, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. The possible outcomes and feedback mechanisms involved are not fully understood, and much research remains to be done; however, over the long term, the potential exists for substantial environmental, social, and economic consequences.

3.10.2 Greenhouse Gas Emissions

GHG emissions that result from human activities primarily include carbon dioxide (CO_2), with much smaller amounts of nitrous oxide (N_2O), methane (CH_4, often from unburned natural gas), sulfur hexafluoride (SF_6) from high-voltage power equipment, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because these GHGs have different warming potentials (i.e., the amount of heat trapped in the atmosphere by a certain mass of the gas), and CO_2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO_2-equivalent (CO_2e) emissions. For example, while SF_6 represents a small fraction of the total annual GHGs emitted worldwide, this gas is very potent, with 23,900 times the global warming potential of CO_2. Therefore, an emission of 1 metric ton of SF_6 would be reported as 23,900 metric tons CO_2e. The global warming potential of CH_4 and N_2O are 25 times and 298 times that of CO_2, respectively (CARB, 2016a). The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

Carbon Dioxide. CO_2 is a naturally occurring gas that enters the atmosphere through natural as well as anthropogenic (human) sources. Key anthropogenic sources include the burning of fossil fuels (e.g., oil, natural gas, and coal), solid waste, trees, wood products, and other biomass, as well as industrially relevant chemical reactions such as those associated with manufacturing cement. CO_2 is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle.

Methane. Like CO_2, CH_4 is emitted from both natural and anthropogenic sources. Key anthropogenic sources of CH_4 include gaseous emissions from landfills, releases associated with mining and materials extraction industries (in particular coal mining), and fugitive releases associated with the extraction and transport of natural gas and crude oil. CH_4 emissions also result from livestock and agricultural practices. Small quantities of CH_4 are released during fossil fuel combustion.

Nitrous Oxide. N_2O is also emitted from both natural and anthropogenic sources. Important anthropogenic sources include industrial activities, agricultural activities (primarily the application of nitrogen fertilizer), the use of explosives, combustion of fossil fuels, and decay of solid waste.

Fluorinated Gases. HFCs, PFCs, and SF_6 are synthetic gases emitted from a variety of industrial processes, and they contribute substantially more to the greenhouse effect on a pound for pound basis than the GHGs described previously. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in small quantities, but because of their potency they are sometimes referred to as "high global warming potential gases."

3.10.2.1 Greenhouse Gas Sources

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. Energy-related CO_2 emissions resulting from fossil fuel exploration and use account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half of the energy-related emissions come from large stationary sources, such as power plants; over one-quarter derive from transportation; and a majority of the remaining sources include: industrial processes, agriculture, commercial, and residential (USEPA, 2017a).

Statewide emissions of GHG from relevant source categories for 2009 through 2015 are summarized in **Table 3.10-1**. Specific contributions from individual air basins, such as the San Francisco Bay Area Air Basin (Air Basin), which encompasses the NBWRP Phase 2 area, are included in the emissions inventory but are not itemized by air basin. In 2015, California produced 440 million gross metric tons of CO_2 emissions. Transportation was the source of 39 percent of the state's GHG emissions, followed by industrial at 23 percent, electricity generation at 19 percent, commercial and residential sources at 11 percent, and agriculture and forestry comprised the remaining 8 percent (CARB, 2017).

TABLE 3.10-1: CALIFORNIA GHG EMISSIONS (MILLION METRIC TONS CO2E)

Emission Inventory Category	2009	2010	2011	2012	2013	2014	2015	
Electricity Generation (In State)	53.51	46.91	41.36	51.18	49.60	51.81	50.21	11.4%
Electricity Generation (Imports)	48.13	43.67	46.94	44.15	40.24	36.56	33.88	7.7%
Transportation	171.45	168.11	164.70	164.38	163.05	164.89	169.38	38.5%
Industrial	97.31	101.12	101.08	101.46	104.27	104.69	102.97	23.4%
Commercial	18.64	20.09	20.73	21.11	21.64	21.37	22.17	5.0%
Residential	30.21	31.26	32.03	30.04	31.19	26.26	26.93	6.1%
Agriculture and Forestry	33.83	34.64	35.28	36.42	34.93	36.03	34.65	7.9%
Not Specified (Solvents & Chemicals)	0.26	0.27	0.25	0.24	0.18	0.24	0.17	<0.1%
Total Gross Emissions	**453.34**	**446.06**	**442.38**	**448.97**	**445.08**	**441.85**	**440.36**	**100.00%**

SOURCE: CARB, 2017.

3.10.3 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Greenhouse Gas Emissions issues and used to determine the significance criteria presented in Section 3.10.3.1 is found in **Appendix 3.10A**.

3.10.4 Direct and Indirect Effects

3.10.4.1 Significance Criteria under CEQA

Appendix G of the CEQA Guidelines indicates that a project would have a significant effect on the environment with respect to GHG emissions if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

For land use projects with operations that are not stationary sources, the BAAQMD's 2017 CEQA Guidelines recommend use of an operational significance threshold of 1,100 metric tons CO_2e per year and for stationary source projects the recommended significance threshold is 10,000 metric tons CO_2e per year (BAAQMD, 2017). With the exception of periodic emergency generator testing and maintenance, the proposed Action would include no new stationary sources of GHG emissions. NBWRP Phase 2 operational emissions would primarily be indirect emissions generated by stationary sources at power plants due to the

use of electricity from PG&E's electrical grid. These sources are regulated and permitted by local air districts throughout California; however, they are outside of the control of the NBWRA and are not under the jurisdiction of the NBWRA. Because the sources of the indirect emissions are already regulated and permitted by the local air districts where the power plants reside, no permit or other BAAQMD approval would be required for the NBWRP Phase 2 demand for electricity. For this reason, the stationary source significance threshold of 10,000 metric tons CO_2e per year is not an appropriate threshold to gauge impact significance of the NBWRP Phase 2.

Therefore, even though the NBWRP Phase 2 is not a typical land use development project, this EIR/EIS nonetheless uses the significance threshold of 1,100 metric tons CO_2e per year to evaluate whether the NBWRP Phase 2 GHG emissions could have a significant impact on the environment. Use of this threshold results in approximately 59 percent of all projects being above the significance threshold and having to implement feasible mitigation measures to meet their CEQA obligations. These projects account for approximately 92 percent of all GHG emissions anticipated to occur between now and 2020 from new land use development in the Bay Area (BAAQMD, 2017). If all land use-project emissions are mitigated to below this threshold, it would represent an overall reduction in new land use project-related emissions of up to 92 percent.

It is acknowledged that this significance threshold was developed to focus on emissions reductions by 2020, and that BAAQMD staff and CARB have not yet provided guidance or recommendations for significance thresholds to evaluate consistency with emissions reduction goals for years beyond 2020; however, since the Executive Order B-30-15 emissions reductions goal of lowering GHG emissions to 40 percent below 1990 levels by 2030 is roughly equivalent to reducing emissions by 42 percent below current levels and the Executive Order S-3-05 emissions reductions goal of lowering GHG emissions to 80 percent below 1990 levels by 2050 is roughly equivalent to reducing emissions by 81 percent below current levels, the 1,100 metric tons CO_2e per year threshold can be used as a rough gauge to determine if the NBWRP Phase 2 would be consistent with these post 2020 goals. For discussion relative to the potential for the NBWRP Phase 2 to result in emissions (including GHG emissions) that could conflict with the BAAQMD's 2017 Clean Air Plan, refer to Impact 3.9.3 in **Section 3.9, *Air Quality***.

The BAAQMD has not adopted a significance threshold for construction-related GHG emissions; however, it requires that the lead agency disclose those emissions and make a determination of impacts in relation to meeting AB 32 reduction goals. For construction-related GHG emissions, other air districts (e.g., South Coast Air Quality Management District (SCAQMD)) have recommended that total emissions from construction be amortized over a period of 30 years (meant to represent the life of the project) and added to operational emissions and then compared to the operational significance threshold (SCAQMD, 2008). This approach to assessing short-term construction emissions is used in this EIR/EIS.

Approach to Analysis under NEPA

For the purposes of the NEPA review, if the NBWRP Phase 2 would trigger Prevention of Significant Deterioration (PSD) or Title V permitting pursuant to 40 CFR Part 52 (i.e., if it would generate more than 100,000 tons of CO_2e emissions per year) it would be considered to result in adverse environmental effects with respect to GHG emissions and climate change.

3.10.4.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Recycling Facility (WRF), and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Construction Emissions

Assumptions regarding construction equipment, equipment horsepower (hp) ratings, and construction phasing were developed by the NBWRA and the Reclamation for input for the GHG emissions modeling used in this analysis. For off-road equipment, emissions were estimated using the California Emissions Estimator Model version 2016.3.1 (CalEEMod v2016.3.1). GHG emissions from

NBWRP Phase 2 related on-road construction vehicles were estimated using CARB's most recent version of its motor vehicle emissions burden model (EMFAC2014). Since the EMFAC2014 model provides GHG emissions factors for CO_2 only, N_2O emission factors for gasoline and diesel combustion were obtained from The Climate Registry (TCR, 2017). GHG emissions in the form of CO_2e were calculated by multiplying the estimated total miles that would be traveled by construction worker vehicles and haul trucks by the GHG emission factors, multiplying the N_2O and CH_4 emissions by their respective global warming potential, and adding the CO_2, N_2O, and CH_4 emissions. Refer to **Appendix 3.9C** for the calculation sheets that were used to estimate the maximum daily average emissions that would be associated with construction of the Proposed Action.

Operational Emissions

Indirect Emissions. The indirect emissions that would be associated with the NBWRP Phase 2 electricity use were estimated using Pacific Gas and Electric Company (PG&E)'s power grid emission factor for year 2020 [i.e., 290 pounds CO_2 per MWh; PG&E, 2015], which is estimated to be the first complete year any component of the NBWRP Phase 2 would be operational. N_2O and CH_4 emission factors for electricity use were obtained from TCR (2017). The proposed NBWRP Phase 2 net increase in annual electricity demand is estimated to be approximately 1,636 MWh per year (Kennedy/Jenks Consultants, 2017). GHG emissions were estimated for CO_2, N_2O, and CH_4, the total CO_2e associated with NBWRP Phase 2 power demand was calculated by multiplying the N_2O and CH_4 emissions by their respective global warming potential, and then those values were added to the CO_2 emissions.

Exhaust Emissions. It is assumed that each proposed action under the NBWRP Phase 2 that would use electricity would require an emergency stand-by generator to operate in the event of a power outage. GHG emissions would be generated from NBWRP Phase 2-related emergency generator testing and maintenance. Routine operation of the emergency generators would be limited to 50 hours per year per generator for testing and maintenance. Fuel consumption factors for the emergency generators were estimated using "other construction equipment" factors for the respective horsepower ratings. GHG emissions associated with emergency generator testing were estimated by multiplying the total diesel fuel that would be consumed by CO_2, N_2O, and CH_4 emission factors obtained from TCR (TCR, 2017). N_2O and CH_4 emission values were multiplied by their respective global warming potentials and added to the CO_2 emissions to obtain CO_2e emissions.

Impact 3.10.1: Incremental contribution to climate change from GHG emissions associated with NBWRP Phase 2. (Less than Significant)

Implementation of NBWRP Phase 2 would result in short-term construction and long-term operational emissions. Construction and operational emissions that would be associated with the proposed actions under NBWRP Phase 2 are discussed separately below; however, the impact conclusion is based on the sum of amortized construction emissions and the operational emissions. See the discussion above for additional information regarding the methods used to estimate NBWRP Phase 2's short-term construction and long-term operation emissions.

No Project/No Action Alternative

There would be no construction, operation, or maintenance-related GHG emissions impacts associated with the No Project Alternative. There would be **no impact**.

Under the No Action Alternative, total amortized emissions that would be associated with NBWRP Phase 2 would be substantially less than those shown in **Table 3.10-4**, and would not trigger PSD or Title V permitting. Therefore, environmental effects of the No Action Alternative with respect to GHG emissions and climate change would not be adverse under NEPA.

Proposed Action

Construction Emissions. As shown in **Table 3.10-2**, GHG emissions generated by construction of NBWRP Phase 2 would total approximately 2,685 metric tons CO_2e over the approximately 4-year construction period, which equates to a 30-year amortized annual average value of approximately 90 metric tons CO_2e (refer to **Section 3.10.3.1, *Significance Criteria under CEQA*** for details on the approach this analysis uses relative to short-term construction emissions; and **Appendix 3.9**, ***Air Quality***, for all assumptions associated with the GHG construction emissions).

Operational Emissions. NBWRP Phase 2 would generate long-term GHG emissions associated with electrical power consumption and operation of diesel-fueled emergency generators. Indirect emissions would result from a total NBWRP Phase 2-related net increase in electricity demand of approximately 1,636 MWh per year. Other emission sources that would occur during operations of the proposed actions under NBWRP Phase 2 would include up to 50 hours per year of routine testing and maintenance of each of the five anticipated emergency generator facilities (as limited by BAAQMD Regulation 9-8-330) that would operate in the event of a power outage. The estimated annual emissions that would be associated with both of these operational sources are presented below in **Table 3.10-3**. As indicated in the table, total net CO_2e emissions associated with operation of the proposed actions under NBWRP Phase 2 would be approximately 231 metric tons per year.

TABLE 3.10-2: TOTAL GHG EMISSIONS FROM NBWRP PHASE 2 CONSTRUCTION

Project Component	CO_2e Emissions (metric tons)
Novato SD	
Recycled Water Facility Treatment Capacity Expansion	67.60
Marin County Lower Novato Creek - Distribution	82.19
Turnout to Wetlands	21.43
Subtotal	171.22
SVCSD	
Napa Road Pipeline	225.91
Subtotal	225.91
MMWD	
San Quentin Prison Recycled Water Distribution System - Pump Station and Other Facilities	91.65
San Quentin Prison Recycled Water Distribution System - Pipeline	38.61
Subtotal	130.25
Napa SD	
Soscol WRF Increased Filter Capacity	96.96
Soscol WRF Covered Storage	190.63
Soscol WRF Covered Storage - Pipeline	11.54
Subtotal	299.13
City of Petaluma	
Ellis Creek WRF Increased Capacity	109.91
Urban Recycled Water Expansion	835.75
Agricultural Recycled Water Expansion – Phases 1 and 2	354.32
Subtotal	1,299.98
City of American Canyon	
Recycled Water Distribution System Expansion – Phase 1	171.90
Recycled Water Distribution System Expansion – Phase 2	221.25
WRF Phase 2 Treatment Plant Upgrades	118.26
WRF Phase 2 Treatment Plant Upgrades - Pipeline	47.49
Subtotal	558.90
Total Emissions	**2,685.39**
Amortized over 30 years	**89.51**

SOURCE: ESA, 2017. See **Appendix 3.9**.

TABLE 3.10-3: TOTAL GHG EMISSIONS FROM PROJECT OPERATIONS

Member Agency – NBWRP Phase 2 Emissions Source	GHG Emissions (metric tons CO_2e per year)		
	Increase in Electricity Consumption	Emergency Generator Testing	Total
Novato SD - RWF Treatment Capacity Expansion	26.49	0.90	27.39
City of Petaluma - Ellis Creek WRF Increased Capacity	98.02	3.97	101.99
Napa SD - Soscol WRF Increased Filter Capacity	51.66	1.68	53.34
MMWD – San Quentin Prison Recycled Water Distribution System	11.35	2.58	13.93
City of American Canyon - WRF Phase 2 Treatment Plant Upgrades	29.14	5.65	34.79
Total	**216.66**	**14.78**	**231.44**

SOURCE: ESA, 2017. See **Appendix 3.9**.

It should also be noted that since recycled water is a by-product of existing secondary and tertiary wastewater treatment processes, it is the least energy-intensive source in the local water supply. The incremental emissions that would be generated under NBWRP Phase 2 shown in **Table 3.10-3** would likely be offset in part or in whole due to the displacement of higher energy intensity water supplies, as well as reducing potable water treatment and distribution (CEC, 2005).

Impact Conclusion

As shown in **Table 3.10-4**, the sum of the 30-year amortized construction GHG emissions and the total net operation emissions that would be associated with NBWRP Phase 2 is approximately 321 metric tons CO_2e per year. These emissions would not exceed the 1,100 metric tons per year significance threshold; therefore, a **less than significant** impact associated with GHG emissions would occur.

TABLE 3.10-4: TOTAL AMORTIZED GHG EMISSIONS

Emissions Source	CO_2e (metric tons per year)
30-Year Amortized Construction Emissions	90
Total Net Operational Emissions	231
Total Project Emissions	**321**
BAAQMD Significance Threshold	1,100
Significant CEQA Impact?	No

SOURCE: ESA, 2017. See **Appendix 3.9**.

NEPA Review

As shown in **Table 3.10-4**, the sum of the 30-year amortized construction GHG emissions and the total net operation emissions that would be associated with NBWRP Phase 2 is approximately 321 metric tons CO_2e per year. These emissions would not exceed 100,000 tons per year and would not trigger PSD or Title V permitting; therefore, the environmental effect of NBWRP Phase 2 with respect to GHG emissions would not be adverse, and NBWRP Phase 2 would not be considered to contribute to the primary and secondary adverse effects of climate change, such as increases in global temperatures, global rise in sea level, ocean acidification, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity.

Program Elements

Six additional projects are evaluated at a program elements level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA. The construction emissions that would be associated with these projects would be similar to the emissions disclosed for the individual NBWRP Phase 2 components shown in **Table 3.10-2**. Three of the projects (seasonal storage for Novato SD and two aquifer storage projects in City of Sonoma for the SCWA) would require pump stations that would use electricity and may require emergency backup generators. The size and use parameters of the pump stations and associated emergency generators are currently unknown; however, the annual operational emissions would be similar to the emissions disclosed for the individual NBWRP Phase 2 components shown in **Table 3.10-3**. With the program elements, the total amortized emissions of NBWRP Phase 2 would be slightly greater than that shown in **Table 3.10-3**; however, the total emissions would continue to be below the 1,100 metric ton CO_2e significance threshold, the CEQA impact would continue to be **less than significant**, and the environmental effect under NEPA would not be adverse.

Storage Alternative

Total amortized emissions of the Proposed Action and the Storage Alternative projects would be greater than those shown in **Table 3.10-4** due to the additional construction emissions and emissions associated with operational electricity use and emergency generator fuel use for the new pump stations; however, the emissions would not exceed the BAAQMD significance threshold of 1,100 metric tons CO_2e. The CEQA impact would be **less than significant**. With regard to NEPA, the emissions of the Proposed Action and emissions associated with the Storage Alternative would not trigger PSD or Title V permitting. Therefore, environmental effects of the Storage Alternative with respect to GHG emissions and climate change would not be adverse under NEPA.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.10.2: Conflict with Executive Order B-30-15 or Executive Order S-3-05 Emissions Reduction Goals. (Less than Significant)

No Project/No Action Alternative

Under the No Project Alternative, there would be no construction, operation, or maintenance-related GHG emissions impacts, therefore would be **no impact**.

Under the No Action Alternative, which includes consideration of future conditions, the GHG emissions would not exceed the emissions significance threshold, which indicates that implementation of the project would be consistent with the State's GHG emission reduction goals for years 2030 and 2050. Therefore, the No Action Alternative would not conflict with Executive Orders B-30-15 or S-3-05. The Storage Alternative would also not trigger PSD or Title V permitting. Therefore, environmental effects of the No Action Alternative would not be adverse under NEPA.

Proposed Action

As described in the *Evaluation of GHG Emissions* discussion above, the 1,100 metric tons CO_2e per year threshold can be used as a rough gauge to determine if the NBWRP Phase 2 would be consistent with the goals identified in Executive Orders B-30-15 or S-3-05. As shown in **Table 3.10-4**, the GHG emissions associated with NBWRP Phase 2 would not exceed the emissions significance threshold, which indicates that implementation of NBWRP Phase 2 would be consistent with the State's GHG emission reduction goals for years 2030 and 2050. Therefore, NBWRP Phase 2 would not conflict with Executive Orders B-30-15 or S-3-05 and the associated impact would be **less than significant**.

Program Elements

With the program elements, the total amortized emissions would be expected to be slightly greater than those shown for NBWRP Phase 2 in **Table 3.10-3**; however, they would continue to be below the 1,100 metric ton CO_2e significance threshold, which indicates that implementation of these projects would be consistent with the State's GHG emission reduction goals for years 2030 and 2050. Therefore, these program elements would not conflict with Executive Orders B-30-15 or S-3-05 and the associated impact would be **less than significant**.

Storage Alternative

Total amortized emissions of the Proposed Action and the Storage Alternative projects would be greater than those shown in **Table 3.10-4**; however, even if the emissions of the Storage Alternative would be twice the amount of the Proposed Action, which is unlikely because it would not be twice the scope of the Proposed Action, the emissions would not exceed the BAAQMD significance threshold of 1,100 metric tons CO_2e. This indicates that implementation of the Storage Alternative would be consistent with the State's GHG emission reduction goals for years 2030 and 2050. Therefore, the Storage Alternative would not conflict with Executive Orders B-30-15 or S-3-05. The CEQA impact would be **less than significant**. In addition, the Storage Alternative would not trigger PSD or Title V permitting. The environmental effects of the Storage Alternative would not be adverse under NEPA.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.10.4.3 Impact Summary by Service Area

Appendix 3.10B provides a summary of potential Project impacts per Member Agency related to greenhouse gas emissions.

3.11 Noise

This section describes the regional noise environment and vibration levels, and identifies sensitive receptors relative to proposed activities in Section 3.11.1, *Affected Environment*. Section 3.11.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the Proposed Action and all alternatives, and summarizes such effects by service area. The analysis if *Cumulative Impacts* is found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources, and impacts per service area are presented in Appendix 3.11A. No comments or other input were received during the scoping period for this EIR/EIS regarding noise.

3.11.1 Affected Environment

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. The decibel measurement system is a logarithmic unit of measurement, such that a ten-fold change in sound pressure is represented by an increase of 10 dB. Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).

3.11.1.1 Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. In fact, community noise varies continuously with time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

These successive additions and deletions of sound to the community noise environment change the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_{dn}: Day-Night Average Sound Level, or the energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

L_x: The sound level that is equaled or exceeded x percent of a specified time period. The L_{50} represents the median sound level (i.e., the noise level exceeded 50 percent of the time, or 30 minutes out of an hour).

CNEL: Similar to the L_{dn}, the Community Noise Equivalent Level (CNEL) adds a 5-dB *penalty* for the evening hours between 7:00 p.m. and 10:00 p.m.

3.11.1.2 Effects of Noise on People

The effects of noise on people can be placed into three categories:

1. subjective effects of annoyance, nuisance, dissatisfaction;
2. interference with activities such as speech, sleep, and learning; and
3. physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way the new noise compares to the existing noise levels to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 2013):

1. Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived;
2. Outside of the laboratory, a 3-dB change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;
3. A change in level of at least 5 dB is required before any noticeable change in human response would be expected; and
4. A 10-dB change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. A ruler is a *linear* scale, which has marks corresponding to equal quantities of distance, (i.e., the ratio of successive intervals is equal to one). A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1,000, 10,000, etc., doubling the variable plotted on the x-axis. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather they combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

3.11.1.3 Noise Attenuation

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate between 6 dB for hard sites and 7.5 dB for soft sites per doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, and scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dB (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles along a highway) attenuate at a rate between 3 dB for hard sites and 4.5 dB for soft sites for each doubling of distance from the reference measurement (Caltrans, 2013).

3.11.1.4 Vibration

As described in the Federal Transit Administration (FTA)'s *Transit Noise and Vibration Impact Assessment*, ground-borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard (FTA, 2006). In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses and heavy trucks on rough roads; and construction activities such as blasting, sheet pile-driving, and operating heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to express RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration assessment include structures (especially older masonry structures), people who spend a lot of time indoors (especially residents, students, the elderly, and sick), and vibration sensitive equipment such as hospital analytical equipment and equipment used in computer chip manufacturing.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves, and/or hanging on walls and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance can be well below the damage threshold for normal buildings.

3.11.1.5 Regional Noise Environment and Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive. A discussion of noise environments for each of the Member Agencies is presented in is found in **Appendix 3.11A**.

3.11.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Noise issues and used to determine the significant criteria present in Section 3.11.3 is found in **Appendix 3.11A**.

3.11.3 Direct and Indirect Effects

3.11.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, the Phase 2 Project or an alternative would have a significant effect on the environment with respect to noise and/or ground-borne vibration if it would:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
2. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
4. Exposure of people residing or working in the project area to excessive noise levels (for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport); or
5. Exposure of people residing or working in the project area to excessive noise levels (for a project within the vicinity of a private airstrip).

3.11.3.2 Impacts Not Further Evaluated

The following topic was found to result in no impacts and was therefore not evaluated further:

> ***Exposure of people to excess noise due to proximity to an airport or private airstrip.*** Regarding the last two significance criteria, because the NBWRP would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise, there would be no impacts associated with these criteria. Therefore, impacts associated with aviation noise are not addressed further.

3.11.3.3 Approach to Analysis

Temporary, Periodic, or Permanent Increase in Ambient Noise Levels. Out of the Member Agencies, only the City of Sonoma has an applicable local policy or standard available to judge whether the project would result in a substantial temporary or permanent increase in ambient noise levels. Pursuant to municipal code, noise levels generated by construction equipment in the City of Sonoma must not exceed 90 dBA at any point outside of the property line. This approach is used to assess the potential to cause a substantial temporary or periodic increase in ambient noise levels at sensitive receptor locations in the City of Sonoma. In addition, the FTA has identified a daytime 1-hour L_{eq} level of 90 dBA as a noise level where adverse community reaction could occur at residential land uses (FTA, 2006). This noise level is used here to assess whether construction-related onsite and off-site noise levels would have the potential to cause a substantial temporary or periodic increase in ambient noise levels at sensitive receptor locations within the jurisdictions of the other Member Agencies.

For the analysis of long-term operational impacts on the existing ambient noise environment, impacts are considered significant if operation of the project facilities would result in a substantial increase in noise levels in the Program area.

Noise Level Standards. Consistency with local noise standards are determined by comparing the applicable noise level standard to published equipment noise levels. With the exception of the cities of Sonoma and Petaluma, noise generated during construction is exempt from local noise standards provided all construction activities occur between a specified period of time. To determine consistency with noise level standards at various distances (i.e., to a property line or sensitive receptor) noise propagation equations are used in order to assess whether a potential conflict could occur.

Groundborne Vibration. None of the local general plans and municipal codes have addressed vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local standards for construction equipment vibration, the evaluation presented under Impact 3.11.3 uses the vibration thresholds presented in **Table 3.11-1** to assess the significance of groundborne vibration and noise impacts. For adverse human reaction, the analysis applies the "strongly perceptible" threshold of 0.1 in/sec PPV for continuous of frequent intermittent sources (Caltrans, 2013). For risk of architectural damage to historic buildings and structures, this analysis applies a threshold of 0.12 in/sec PPV (Caltrans, 2013). A threshold of 0.3 in/sec PPV is used for all other buildings. The FTA provides an equation that may be used to estimate vibration at different distances based on a reference PPVs at 25 feet for various construction equipment. Using the FTA equations, construction equipment vibration levels were calculated and compared to the applied human annoyance and damage thresholds shown in **Table 3.11-1**.

TABLE 3.11-1: VIBRATION THRESHOLDS

	Maximum Peak Particle Velocity (PPV), inches per second (in/sec)
Adverse human reaction (human annoyance)	0.1
Historic buildings and structures	0.12
All other structures	0.3

NOTE: The vibration criteria are based on continuous or frequent intermittent sources, including impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, 2013.

3.11.3.4 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.11.1: Construction activity would result in a substantial temporary increase in ambient noise levels in the vicinity of Program projects during construction. (Less than Significant with Mitigation)

No Project/No Action Alternative

Under the No Project Alternative there would be **no impact** associated with ambient noise levels.

Under the No Action Alternative, all of these projects, with the exception of the Marin County Lower Novato Creek Project 1, would result in a **less-than-significant** impact under CEQA and the effects would not be adverse under NEPA. Implementation of **Mitigation Measure 3.11-1** would ensure that impacts associated with the Marin County Lower Novato Creek Project 1 are **less than significant with mitigation**.

Proposed Action

The NBWRP would require construction of new pipelines and storage facilities as well as upgrades to existing wastewater treatment plants (WWTPs) and water recycling or reclamation facilities (WRFs). Pipelines would be installed using a combination of the following methods: trenching; jack and bore tunneling; directional drilling; and pipeline suspension. Storage facilities would be constructed using excavation and earth movement techniques as well as embankment construction and hydro-seeding. Upgrades to existing facilities would include construction of new booster pump stations as well as other infrastructure required to increase tertiary treatment capacity at the WWTPs and WRFs. These activities would require rough grading and excavation or filling to bring the site to final grade. Refer to Appendix 3.9, *Air Quality and GHG Emissions and Fuel Use Estimates*, for the specific equipment types that would be required to construct the proposed NBWRP Phase 2. **Table 3.11-2** shows typical noise levels produced by the types of construction equipment that would likely to be used during construction.

TABLE 3.11-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Type of Equipment	L_{max}, dBA at 50 feet	Percent Usage	Hourly L_{eq}, dBA	
			at 50 feet	at 100 feet
Dump Truck	84	40%	80	72
Excavator	85	40%	81	73
Loader	80	40%	76	68
Grader	85	40%	81	73
Saw	90	20%	83	75
Jack Hammer	85	20%	78	70
Bulldozer	85	40%	81	73
Crane	85	16%	77	70
Paver	85	16%	77	70
Roller	85	20%	78	70
Generator	82	50%	79	71
Backhoe	80	40%	76	68
Auger Drilling Rig*	85	20%	78	70

NOTE:* Represents tunnel boring machine.
SOURCE: FHWA, 2006.

The operation of each piece of off-road equipment within project construction areas would not be constant throughout the day, as equipment would be turned off when not in use. Most of the time over a typical workday, the equipment would be operating at different locations and all the equipment would not necessarily operate concurrently within the same location of the project area. To quantify construction-related noise exposure at the nearest sensitive land uses, it is assumed that the two loudest pieces of construction equipment would operate within the project areas closest to the nearest off-site sensitive land uses. A discussion of impact per service area is provided in **Appendix 3.11A**, and identified in **Table 3.11-3** below.

Sensitive receptors located near each proposed project would be exposed to equipment associated with that project. For each project, the two loudest pieces of equipment that would be operating during project construction were identified. Using the reference noise levels provided in **Table 3.11-2**, the level of noise (dBA L_{eq}) generated by those pieces of equipment running at the same time and place from a distance of 50 feet is identified in **Table 3.11-3**. Assuming a 7.5 dB per doubling of distance drop-off rate, resulting noise levels for sensitive receptors from the construction area are identifying. With the exception of the Marin County Lower Novato Creek Project 1, these sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, there would be a **less-than-significant** impact with respect to substantial, temporary, or periodic increase in ambient noise levels during project construction. A discussion of Marin County Lower Novato Creek Project 1 is provided below.

Marin County Lower Novato Creek Project 1 – Distribution. The Marin County Lower Novato Creek Project 1 – Distribution project would consist of construction of distribution pipelines. The construction of these facilities is expected to begin in mid-2021 and take approximately three months to complete.

The closest sensitive land uses to the pipeline construction areas consist of single-family residences along Lois Drive with back yards immediately adjacent to where the pipeline would be constructed northwest of the North Deer Island Stormwater Basin. These single-family residences are located as close as 25 feet from where construction activities would occur. An excavator and crane are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2**, an excavator and generator running at the same time and place could generate a noise level of 83 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors

TABLE 3.11-3: CONSTRUCTION NOISE IMPACTS BY MEMBER AGENCY

Agency	Projects	Distance to Nearest Sensitive Receptor	Equipment Decibels (dB Leq)[1]	Resulting Noise Level at Sensitive Receptor[2]	Threshold[3]	Mitigation Required?	Significance after Mitigation
Novato SD	RWF Treatment Capacity Expansion	550 ft	82	56	90		LTS
	Marin County Lower Novato Creek Project 1 - Distribution	25 ft	83	91	90	Yes	LSM
	Turnout to Wetlands	3,100 ft	83	38	90	No	LTS
SVCSD	Napa Road Pipeline	50 ft	85	85	90	No	LTS
MMWD[1]	San Quentin Prison Recycled Water Distribution System	100 ft	85	77	90	No	LTS
Napa SD	Increase Soscol WRF Filter Capacity	> 1mi.	85	--	90	No	LTS
	Soscol WRF Covered Storage	> 1mi.	85	--	90	No	LTS
Petaluma	Increase Ellis Creek WRF Capacity	450 ft	82	66	90	No	LTS
	Urban Recycled Water Expansion	50 ft	85	83	90	No	LTS
	Agricultural Recycled Water Expansion 1	50 ft	85	81	90	No	LTS
	Agricultural Recycled Water Expansion 2	50 ft	85	81	90	No	LTS
American Canyon	Recycled Water Distribution System Expansion 1	50 ft	85	81	90	No	LTS
	Recycled Water Distribution System Expansion 2	50 ft	80	--	90	No	LTS
	WRF Phase 2 Treatment Plant Upgrades	2,800 ft	84	40	90	No	LTS

NOTES:
1 Two loudest pieces of equipment operating at same time and location; resulting noise level at 50 feet.
2 Assumes 7.5 dBA attenuation per doubling of distance.
3 FTA noise increase threshold of 90 dBA L_{eq},

SOURCE: ESA, 2018

from the construction area would be exposed to a noise level of 91 dBA L_{eq}. These sensitive land uses would be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}, representing a potentially significant impact under CEQA. After implementing **Mitigation Measure 3.11-1** the impact would be **less than significant with mitigation**.

Program Elements

Nine additional projects are evaluated at a programmatic level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA. Since the exact timeframe and construction schedule and phasing for these projects are currently unknown, the construction noise exposure at nearby sensitive land uses cannot be determined. However, assuming that construction equipment for these projects are similar to the individual Phase 2 projects, the loudest two pieces of construction equipment could consist of an excavator and saw. Using the reference noise levels provided in **Table 3.11-2**, an excavator and saw operating at the same time and place could generate a noise level of 85 dBA L_{eq} from a distance of 50 feet. It is unlikely that any of the programmatic projects construction activities would occur closer than 50 feet of an off-site sensitive land use. Therefore, it can be assumed that sensitive land uses located adjacent to these project construction areas would be exposed to construction noise levels below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Storage Alternative

For the Storage Alternative, a discussion of impacts related to the additional facilities proposed under this alternative is provided in **Appendix 3.11A,** and identified in **Table 3.11-4** below.

TABLE 3.11-4: CONSTRUCTION NOISE IMPACTS BY MEMBER AGENCY

Agency	Projects	Distance to Nearest Sensitive Receptor	Equipment Decibels (dB Leq)[1]	Resulting Noise Level at Sensitive Receptor[2]	Threshold[3]	Mitigation Required?	Significance after Mitigation
Novato SD	RWF Treatment Capacity Expansion	550 ft.	82	56	90	No	LTS
	Seasonal Storage – State Route 37 Option 1	2,600 ft.	82	39	90	No	LTS
SVCSD	Seasonal Storage – Mulas Site	3,100 ft.	82	37	90	No	LTS
Petaluma	Site Southeast of Ellis Creek WRF	3,500 ft.	85	36	90	No	LTS
Napa SD	Jameson Ranch Site	50 ft.	83	83	90	No	LTS
	MST Northern and Eastern Loop	50 ft.	83	83	90	No	LTS

NOTES:
1 Two loudest pieces of equipment operating at same time and location; resulting noise level at 50 feet.
2 Assumes 7.5 dBA attenuation per doubling of distance.
3 FTA noise increase threshold of 90 dBA Leq,

SOURCE: ESA, 2018

Mitigation Measures

Mitigation Measure 3.11-1 *applies to the Marin County Lower Novato Creek Project 1 – Distribution Project.*

Mitigation Measure 3.11-1: Construction Noise Reduction Measures

The applicable Member Agency shall develop and implement a Construction Noise Reduction Plan. The Construction Noise Reduction Plan shall be submitted to the County of Marin for review and approval prior to construction. A disturbance coordinator shall be designated for the project to implement the provisions of the plan. At a minimum, the Construction Noise Reduction Plan shall implement the following measures:

1. Distribute to the potentially affected residences and other sensitive receptors within 100 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule.
2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.
3. Maintain maximum physical separation, as far as practicable, between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community.
4. Impact tools (e.g., jack hammers, pavement breakers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used.
5. Use construction noise barriers such as paneled noise shields, blankets, or enclosures adjacent to noisy stationary equipment. Noise control shields, blankets or enclosures shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.
6. Truck hauling access routes to project sites along local roadways shall use roadways with the fewest residences feasible to minimize vehicle noise exposure to nearby residences.

Impact Significance after Mitigation: Less than Significant.

Impact 3.11.2: Construction activity would violate standards established in the local general plans or noise ordinances, and/or would adversely affect nearby sensitive receptors. (Less than Significant with Mitigation)

No Project/No Action Alternative

As the No Project Alternative assumes none of the Phase 2 Program elements would be constructed, there would be **no impact** to associated with construction-related noise.

Under the No Action Alternative, these projects could exceed either construction time-of-day restrictions and construction noise thresholds in the jurisdiction's municipal codes. Implementation of **Mitigation Measure 3.11-2a** would reduce the impacts associated to the Marin County Lower Novato Creek Project 1 – Distribution (Novato SD) and Turnout to Wetlands (Novato SD), and implementation of **Mitigation 3.11-2a** (Construction Time of Day Restrictions) and **Mitigation 3.11-1** (Construction Noise Reduction Measures) would reduce impacts associated to the Urban Recycled Water Expansion (Petaluma) and the first phase of American Canyon's Recycled Water Distribution System Expansion. The impact would be **less than significant with mitigation.**

Proposed Action

Novato SD

The City of Novato noise ordinance limits construction hours to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 10:00 a.m. and 5:00 p.m. on Saturdays. Construction activities in the City of Novato are not permitted on Sundays or on any federal holidays. Authorized grading activities are only permitted on weekdays when City inspectors are available to monitor activities.

Since the hours of construction are unknown at this time, construction activities associated with the RWF Treatment Capacity Expansion, Marin County Lower Novato Creek Project 1 – Distribution, and Turnout to Wetlands projects may exceed the allowable construction work hours specified in the City of Novato noise ordinance. Therefore, the proposed construction activities within the jurisdiction of the City of Novato could violate the City's municipal code and result in an associated significant impact under CEQA. To ensure that these time-of-day restrictions would be followed by the Novato SD and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

SVCSD

The SVCSD Napa Road Pipeline project construction would occur within an unincorporated area of Sonoma County. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County. Therefore, the proposed construction activities within the jurisdiction of the County of Sonoma would not violate the County's general plan or municipal code. To ensure impacts are less than significant, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) and **Mitigation Measure 3.11-1** (Construction Noise Reduction Measures) are recommended. The impact would be **less than significant with mitigation**.

MMWD

The San Quentin Prison Recycled Water Distribution System project would be located within the City of San Rafael and an unincorporated area of Marin County. The City of San Rafael's zoning ordinance (Section 8.13.040) limits construction activities to between 7:00 a.m. and 6:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturday. Construction on Sundays and designated holidays is prohibited, unless approved by the City on a case-by-case basis. According to the Chapter 6.70 of the Marin County municipal code, construction activities are allowed between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and between 9:00 a.m. and 5:00 p.m. on Saturdays and holidays. Special exemptions may occur for construction projects of a city, county, State, other public agency, or other public utility (Marin County, 2008).

Since the hours of construction are unknown at this time, proposed construction activities may exceed the allowable construction work hours specified in the city and county noise codes. Therefore, the proposed construction activities within either jurisdiction could violate these codes and result in a significant impact under CEQA. To ensure that these time-of-day restrictions would be followed by MMWD and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

Napa SD

The proposed construction activities associated with the installation of a 1.7 mgd capacity tertiary filter, a 10 acre-feet capacity storage pond, and 600 linear feet of pipelines at the Soscol WRF would be located within an unincorporated area of Napa County. As discussed in **Appendix 3.11B**, Chapter 8.08.025 of the Napa County municipal code limits construction activities to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. In addition to these restricted construction hours, the County restricts start-up of machines and equipment to after 8:00 a.m., Monday through Friday; delivery of materials and equipment to after 7:30 a.m. and before 5:00 p.m., Monday through Friday; cleaning of machines and equipment to before 6:00 p.m., Monday through Friday; servicing of equipment to before 6:45 p.m., Monday through Friday; and construction on weekends or legal holidays to the hours of 8:00 a.m. to 4:00 p.m.

Since the hours of construction are unknown at this time, proposed construction activities may exceed the allowable construction work hours specified in the Napa County noise ordinance. Therefore, the proposed construction activities within the jurisdiction of the Napa County could violate the County's municipal code and result in a **significant impact** under CEQA. To ensure that these time-of-day restrictions would be followed by the Napa SD and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

City of Petaluma

Ellis Creek WRF Increased Capacity and Urban Recycled Water Expansion. The proposed construction of a 2.12-mgd capacity tertiary filter and associated onsite piping, pumps, and UV disinfection lamps at the existing Ellis Creek WRF as well as the Urban Recycled Water Expansion would occur within the jurisdiction of the City of Petaluma. The City of Petaluma ordinance limits noise generating construction activities to the hours of 7:00 a.m. to 10:00 p.m. on weekdays and 9:00 a.m. to 10:00 p.m. on weekends and holidays. In addition to restricted hours of construction, the ordinance establishes an hourly average level of 60 dBA as the maximum that may be generated on one land use that would be affecting another land use.

As previously discussed under Impact 3.11.1, above, the closest sensitive land use to the Ellis Creek WRF consist of two single-family residences located approximately 250 feet from where onsite construction activities would occur, across Lakeville Highway. Assuming that a grader and crane are operating at the same time and place, these single-family residences would be exposed to a noise level of 66 dBA L_{eq}, which would exceed the City's applied exterior noise threshold of 60 dBA L_{eq}. Since the hours of construction are unknown at this time, the proposed construction activities may exceed the allowable construction work hours specified in the City of Petaluma ordinance. Therefore, the proposed construction activities within the jurisdiction of the City of Petaluma could violate the City ordinance and result in a **significant impact** under CEQA. To ensure that these time-of-day restrictions would be followed by the City of Petaluma and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) and **Mitigation Measure 3.11-1** (Construction Noise Reduction Measures) are recommended. The impact would be **less than significant with mitigation**.

Agricultural Recycled Water Expansion – Phase 1 and 2. The proposed Phase 1 and 2 pipeline extension along Lakeville Highway from the existing Ellis Creek WRF would occur within an unincorporated area of Sonoma County. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County. Therefore, the proposed construction activities within the jurisdiction of the County of Sonoma would not result in a violation the County's general plan or municipal code. There would be **no impact** under CEQA.

American Canyon

Recycled Water Distribution System Expansion – Phases 1 and 2. The proposed Phase 1 Recycled Water Distribution System Expansion would occur entirely with the jurisdiction of the City of American Canyon. According to Chapter 8.12.080(B)(2)(a) of the City's municipal code, construction is prohibited between the hours of 7:00 p.m. and 7:00 a.m. In addition to restricted hours, the City's municipal code prohibits noise generated during construction to exceed 75 dBA L_{max} at the nearest sensitive land use between the hours of hours of 7:00 a.m. and 7:00 p.m.

As previously discussed under Impact 3.11.1, above, the closest sensitive land use to the proposed Phase 1 pipeline alignment consist of densely populated single-family residences adjacent to Benton Way and Spikerush Circle. These residences would be located within 50 feet from where onsite construction activities would occur. A pavers and crane are the two loudest pieces of off-road equipment that would operate during project construction. Using the reference noise levels provided in **Table 3.11-2**, a paver and crane running at the same time and place could generate a noise level of 88 dBA L_{max} from a distance of 50 feet, which would exceed the City's noise threshold of 75 dBA L_{max}. Since the hours of construction are unknown at this time, the proposed construction activities may exceed the allowable construction work hours specified in the City's municipal code. Therefore, the proposed construction activities within the jurisdiction of the City of American Canyon would violate the City's municipal code and result in a significant impact. To ensure that applicable time-of-day restrictions would be followed by the City and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended and **Mitigation Measure 3.11-2b** (Construction Noise Reduction Measures) is recommended to reduce construction noise levels and the associated nuisance at sensitive receptor locations. The impact would be **less than significant with mitigation**.

WRF Phase 2 Treatment Plant Upgrades. The proposed upgrades at the existing American Canyon WRF would occur entirely within the jurisdiction of the City of American Canyon. As previously discussed, the City's municipal code restricts all construction activities to within the daytime hours and prohibits noise generated during construction to exceed 75 dBA L_{max} at the nearest sensitive land use.

The closest sensitive land use to the American Canyon WRF consist of single-family residences located approximately 2,800 feet south east of the proposed project area. A grader and excavator are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2**, a grader and excavator running at the same time and place could generate a noise level of 84 dBA L_{max} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest single-family residences to the onsite construction areas would be exposed to a noise level of 40 dBA L_{max}, which is well below the City's noise standard of 75 dBA L_{max}. Since the hours of construction are

unknown at this time, the proposed construction activities could exceed the allowable construction work hours specified in the City's municipal code. Therefore, the proposed construction activities within the jurisdiction of the City of American Canyon could violate the City's municipal code and result in a significant impact under CEQA. To ensure that these time-of-day restrictions would be followed by the applicant and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

Program Elements

Eight additional projects are evaluated at a programmatic level because they are still conceptual and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in or near City of Sonoma for the SCWA.

The proposed Expansion 3 pipeline extension along Lakeville Highway proposed by the City of Petaluma would occur within an unincorporated area of Sonoma County. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the county. Therefore, the proposed construction activities within county jurisdiction would not result in a violation the County's general plan or municipal code. There would be **no impact** under CEQA.

The other proposed Program Element projects would occur within jurisdictions that have construction time-of-day restrictions and construction noise thresholds in their municipal codes. As previously discussed, the City of Novato, Napa County, and City of Sonoma have time-of-day restrictions for construction related activities in their municipal codes. In addition to time-of-day restrictions for construction activities, the City of Sonoma has an applied noise standard of 60 dBA L_{eq} and 90 dBA L_{eq} in its municipal code.

Since the hours of construction are unknown at this time, it is possible that construction of these projects could exceed local policies and standards and result in a **significant impact** under CEQA. To ensure that local time-of-day restrictions would be followed by the applicant and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) and **Mitigation Measure 3.11-2b** (Construction Noise Reduction Measures) are recommended. The impact would be **less than significant with mitigation**.

Storage Alternative

A summary of impact per service area is provided below.

Novato SD

This alternative would include two projects for Novato SD RWF Treatment Capacity Expansion and Seasonal Storage – SR37. Both of these projects are located with the jurisdiction of the City of Novato. The City of Novato noise ordinance limits construction hours to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 10:00 a.m. and 5:00 p.m. on Saturdays. Construction activities in the City of Novato are not permitted on Sundays or on any federal holidays. Authorized grading activities are only permitted on weekdays when City inspectors are available to monitor activities.

Since the hours of construction are unknown at this time, construction activities associated with these projects under the Storage Alternative may exceed the allowable construction work hours specified in the City of Novato noise ordinance. Therefore, the proposed construction activities could violate the City's municipal code and result in an associated **significant impact** under CEQA. To ensure that these time-of-day restrictions would be followed by the Novato SD and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

SVCSD

The Storage Alternative would include construction of new seasonal storage pond at the Mulas site to allow SVCSD to store 49 AF of tertiary effluent during winter months to serve nearby agricultural customer demands in summer months. The proposed project would be located within an unincorporated area of the County of Sonoma. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County. Therefore, the proposed construction activities within the jurisdiction of the County of Sonoma would not violate the County's general plan or municipal code. Under CEQA, there would be **no impact**.

Napa SD

The Storage Alternative would include construction of two new seasonal storage ponds to store 600 AF recycled water from Soscol WRF and expanding the Napa SD recycled water distribution system to supply recycled water to more customers. These projects would be located within an unincorporated area of Napa County. As discussed in Section 11.2, *Regulatory Setting*, Chapter 8.08.025 of the Napa County municipal code limits construction activities to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. In addition to these restricted construction hours, the County restricts start-up of machines and equipment to after

8:00 a.m., Monday through Friday; delivery of materials and equipment to after 7:30 a.m. and before 5:00 p.m., Monday through Friday; cleaning of machines and equipment to before 6:00 p.m., Monday through Friday; servicing of equipment to before 6:45 p.m., Monday through Friday; and construction on weekends or legal holidays to the hours of 8:00 a.m. to 4:00 p.m.

Since the hours of construction are unknown at this time, proposed construction activities may exceed the allowable construction work hours specified in the Napa County noise ordinance. Therefore, the proposed construction activities could violate the County's municipal code and result in a **significant impact** under CEQA. To ensure that these time-of-day restrictions would be followed by the Napa SD and/or its construction contractors, **Mitigation Measure 3.11-2a** (Construction Time-of-Day Restrictions) is recommended. The impact would be **less than significant with mitigation**.

City of Petaluma

The Storage Alternative would include construction of two new seasonal storage ponds at a site southeast of the existing Ellis Creek WRF ponds to allow the City of Petaluma to store 300 AF of secondary effluent during winter months to later serve agricultural customers in summer months. The proposed project would occur within the jurisdiction of Sonoma County. The County of Sonoma General Plan Noise Element does not specifically address intermittent or short-term construction noises, and a noise ordinance has not yet been adopted by the County. Therefore, the proposed construction activities within the jurisdiction of the County of Sonoma would not violate the County's general plan or municipal code. Under CEQA, there would be **no impact**.

Mitigation Measures

Mitigation Measure 3.11-2a: Construction Time-of-Day Restrictions

All NBWRP Phase 2 project construction activities shall be limited to the acceptable hours identified within the applicable jurisdiction policies and/or municipal codes unless granted a special exemption by the applicable jurisdiction.

Significance after Mitigation: Less than Significant.

Impact 3.11.3: Construction activity could expose sensitive receptors to excessive ground-borne vibration levels. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** associated with ground-borne vibration under the No Project Alternative.

Under the No Action Alternative, all of these projects would not expose nearby sensitive land uses to vibration levels that would result in human annoyance or building damage. Therefore, this impact would be **less than significant** under CEQA.

Proposed Action

Human annoyance and building damage are typically the primary issues concerning temporary construction impacts from vibration. Construction activities that may result in temporary vibration impacts include the use of a vibratory roller, jack and bore tunneling, and directional drilling. Impact pile driving is not proposed under any of the Phase 2 projects. Jack and bore tunneling and directional drilling techniques would be used when open trenching is not feasible due to limited construction area, geotechnical conditions, or presence of sensitive biological resources such as wetlands or riparian habitat.

For adverse human reaction, the analysis applies the "strongly perceptible" threshold of 0.9 in/sec PPV for transient sources (Caltrans, 2013b). For risk of architectural damage to historic buildings and structures, this analysis applies a threshold of 0.12 in/sec PPV (Caltrans, 2013b). A threshold of 0.3 in/sec PPV is used for all other buildings. **Table 3.11-5** displays typical vibration levels associated with jack and bore tunneling and directional drilling. As shown in **Table 3.11-5**, none of proposed construction equipment would expose nearby sensitive receptors to vibration levels that would be considered "strongly perceptible." However, historic buildings located within 25 feet of vibratory rollers and 75 feet of Jack-and-bore rigs and all other buildings located within 25 feet of Jack-and-bore rigs could be exposed to vibration levels that could result in building damage. A discussion of temporary vibration impacts by Member Agency is provided below.

Novato SD

Construction activities associated with the Marin County Lower Novato Creek and Turnout to Wetlands projects may require the use of vibratory rollers during the installation of pipelines. As previously discussed, single-family buildings could be located within 25 feet from onsite construction areas. As shown in **Table 3.11-5**, these single-family buildings could be exposed to vibrations of 0.210 in/sec PPV during the operation of a vibratory roller, which would exceed the applied vibration threshold for historic buildings. However, since there are no historic buildings located within 25 feet of the proposed pipeline alignments within the jurisdiction of the Novato SD, this impact would be **less than significant** under CEQA.

TABLE 3.11-5: VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Distance (feet)	Peak Particle Velocity (inches per second)		
	Vibratory Roller	Jack and Bore[a]	Directional Drilling[b]
25	**0.210**	**0.644**	0.089
50	0.074	**0.228**	0.031
75	0.040	**0.124**	0.017
100	0.026	0.081	0.011
150	0.014	0.044	0.006

NOTES:
[a] Peak particle velocities from jack and bore operations were assumed to be comparable to impact pile driving techniques.
[b] Peak particle velocities from directional drilling operations were assumed to be comparable to caisson drilling techniques.

Bold = Peak particle velocities that exceed the historic building threshold of 0.12 in/sec PPV or the building damage threshold of 0.3 in/sec PPV.

SOURCE: FTA, 2006.

SVCSD

The installation of the pipeline along Napa Road would require the use of a vibratory roller and would require jack-and-bore crossing at East 8th Street and at a creek 650 feet east of Hyde Road. The closest sensitive land use to the proposed Napa Road Pipeline construction areas consist of clusters of single-family residences. These single-family residences could be located within 50 feet from where excavation and boring would occur. As shown in **Table 3.11-5**, the nearest single-family building would be exposed to vibration levels of 0.228 in/sec PPV, which would not exceed the applied building damage threshold of 0.3 in/sec PPV. There are no known historic buildings located in the vicinity of the proposed construction areas. Therefore, this would result in a **less-than-significant impact** under CEQA.

MMWD

The installation of 5,800 linear feet of pipeline connecting San Quentin Prison to the CMSA Treatment Plant would require the use of a vibratory roller and a jack-and-bore rig. The closest buildings to where these pieces of equipment would operate consist of single-family buildings and inmate housing building at the San Quentin State Prison. The single-family buildings and inmate housing buildings at the San Quentin State Prison are located approximately 100 feet and 150 feet from the proposed pipeline, respectively. As shown in **Table 3.11-5**, the use of vibratory roller and drill rig would expose the nearest building to a vibration level of 0.026 and 0.081 in/sec PPV, respectively, which are below the applied modern and historic building thresholds. Therefore, this impact would be **less than significant** under CEQA.

Napa SD

The installation of 600 linear feet of pipeline connecting the Soscol WRF to the a nearby existing pond would require the use of a vibratory roller. The closest building to the proposed pipeline alignment consists of single-family residences located well over a mile of the WRF. As shown in **Table 3.11-5**, these single-family buildings would not be exposed to vibration levels that would exceed the applied vibration thresholds for building damaged. Therefore, the impact would be **less than significant** under CEQA.

Petaluma

The Urban Recycled Water Expansion project would construct approximately 8 miles of recycled water pipelines throughout the eastern portion of the City of Petaluma. The installation of these pipeline alignments would require the use of a vibratory roller and jack-and-bore. The closest sensitive land use to the proposed pipeline alignments consist of single-family residences and Kenilworth Junior High School, which would be located as close as 50 feet from where onsite construction activities would occur. As shown in **Table 3.11-5**, the nearest single-family building would be expose to vibration levels of 0.228 in/sec PPV, which would not exceed the applied historic building or normal building damage thresholds of 0.12 in/sec and 0.3 in/sec PPV, respectively. There are no known historic buildings located in the vicinity of the proposed construction areas. Therefore, this would result in a **less-than-significant impact** under CEQA.

American Canyon

Construction of the proposed pipeline alignments under Phases 1 and 2 of the Recycled Water Distribution System Expansion project would require the use of a vibratory roller and jack-and-bore rig. The closest sensitive land uses to these pipeline alignments consist of densely populated single-family residences adjacent to Benton Way and Spikerush Circle. These residences would be located within 50 feet from where construction activities would occur. As shown in **Table 3.11-5**, the nearest single-family building would be exposed to vibration levels of 0.228 in/sec PPV, which would not exceed the applied building damage threshold of 0.3 in/sec PPV. There are no known historic buildings located in the vicinity of the proposed construction areas. Therefore, this impact would be **less than significant** under CEQA.

Program Elements

Eight additional projects are evaluated at a programmatic level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA.

Most of the pipeline proposed under these programmatic projects would be installed at existing WRF and along existing roadway roadways and require the use of vibratory rollers and jack and bore tunneling. As shown in **Table 3.11-5**, historic buildings located within 25 feet of vibratory rollers and 50 feet of Jack-and-bore rigs and all other buildings located within 25 feet of Jack-and-bore rigs could be exposed to vibration levels that could result in building damage. Therefore, this impact would be potentially significant under CEQA. Implementation of **Mitigation Measure 3.11-3** would require the construction contractor to use alternatives to jack and bore tunneling when activities would take place within 75 feet of an existing structure. If use of other trenchless technologies such as directional drilling or pipeline suspension would not be feasible, the contractor would be required to develop a Construction Vibration Mitigation Plan to ensure that no structures would be damaged by proposed activities. The impact would be **less than significant with mitigation**.

Storage Alternative

It assumed that the jack-and-bore would be used during the construction of the projects proposed under the Storage Alternative. As shown in **Table 3.11-5**, historic buildings located within 75 feet of Jack-and-bore rigs and all other buildings located within 25 feet of Jack-and-bore rigs could be exposed to vibration levels that could result in building damage. None of the proposed projects proposed under the Storage Alternative would operate off-road equipment with 75 feet from the nearest sensitive land uses. Consequently, construction of these projects would not expose nearby sensitive land uses to vibration levels that would result in an annoyance or building. this impact would be **less than significant** under CEQA.

Mitigation Measures

Mitigation Measure 3.11-3 *applies to all Program Elements.*

> **Mitigation Measure 3.11-3: Vibration Control**
>
> The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack-and-bore when there are historical building structures within 100 feet of the proposed activities and/or any building structure within 50 feet of the proposed activities. If the contractor provides the applicable Member Agency with acceptable documentation indicating that alternative trenchless technology is not feasible for the given crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack-and-bore as far as possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan shall also include the development of a vibration monitoring plan to be implemented during construction of a particular crossing.

Impact Significance after Mitigation: Less than Significant.

Impact 3.11-4: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** to ambient noise levels under the No Project Alternative.

None of the projects under the No Action Alternative would require extensive operation and maintenance activities or include any stationary noise sources that would not be enclosed. The increase in employee and haul trips related to operation of these facilities, compared to existing conditions, would contribute incrementally to traffic noise along location roadways. in the noise exposure. Therefore, there would be no increases in ambient noise levels from stationary and mobile noise sources at all other facilities and the impact would be **less than significant**.

Proposed Action

Mobile Noise Sources

Operation of the facilities included in the NBWRP Phase 2 would not require extensive operation and maintenance activities. The NBWRP Phase 2 would not result in noticeable long-term changes in traffic. Any increase in vehicle trips related to operation of the proposed facilities under NBWRP Phase 2, compared to existing conditions, would not contribute incrementally to traffic noise along

local roadways. It takes a doubling of traffic to increase noise levels by only 3 dB, which is considered barely perceptible to the average person (Caltrans, 2013). Since the increase in vehicular traffic during operations would not be substantial, it is unlikely that the NBWRP Phase 2 projects would result in a perceptible increase in traffic noise.

Operation of the proposed pipelines would not require routine site visits. Maintenance activities include such tasks as landscape maintenance, visual inspections of facilities, performance monitoring, servicing of pumps, testing and servicing of valves, and pipeline repairs. The vehicle trips generated by these routine and periodic site visits would be similar in number to those required under existing conditions and would not increase noise levels on area roadways. For all project components, impacts associated with traffic-related noise during operations of NBWRP Phase 2 would be **less than significant** under CEQA.

Stationary Noise Sources

MMWD

San Quentin Prison Recycled Water Distribution System – Pump Station. Noise from pump operations would be attenuated by both soil and the subsurface concrete casing. A pump motor would typically generate a noise level on the order of 76 dBA L_{eq} at a distance of 50 feet (FTA, 2006) without an enclosure. However, the presence of the proposed concrete enclosure would be expected to provide a minimum of 20 dB of attenuation. Operation of the new pump station would conservatively generate a noise level of approximately 56 dBA at 50 feet.

The nearest sensitive land uses to the proposed pump stations consists of single-family residences located approximately 1,000 feet south-west of the proposed pump station, across Sir Francis Drake Boulevard. Assuming a 7.5 dB drop-off rate per doubling of distance, these single-family residences would be exposed to a noise level of 33 dBA L_{eq}. These single-family residential areas are already exposed to vehicular traffic noise levels associated with Sir Francis Drake Boulevard that exceed 33 dBA L_{eq}. In addition to distance, the intervening topography would further attenuate any operational noise. Consequently, any noise generated by the proposed pump station would generally not be perceivable due to existing vehicular traffic noise. Under CEQA, the impact would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

All Other Proposed Facilities

Stationary noise sources such as pumps stations are not proposed at any of the other proposed facilities. Therefore, there would be no increases in ambient noise levels from stationary noise sources at all other facilities and the impact is **less than significant**.

Program Elements

Six additional projects are evaluated at a programmatic level because they are currently at a conceptual level and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA.

Mobile Noise Sources

As previously discussed, operation of the facilities within the jurisdiction of the Novato SD, City of Petaluma, Napa SD and City of Sonoma would not require extensive operation and maintenance activities. The increase in employee and haul trips related to operation of these facilities, compared to existing conditions, would contribute incrementally to traffic noise along location roadways. For all programmatic project components, impacts associated with traffic-related noise during project operations would be less than significant. Under CEQA, there would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

Stationary Noise Sources

Sonoma County Water Agency

Valley of the Moon Aquifer Storage and Recovery. The proposed Valley of the Moon Aquifer Storage and Recovery (ASR) well site is located within the jurisdiction of the Sonoma County Water Agency within an unincorporated area of Sonoma County. The proposed ASR well site would include the installation of one new pump station. The proposed pump station is assumed to be fully enclosed. A previously discussed, noise from pump operations would be attenuated by both soil and the surface concrete casing. A pump motor would typically generate a noise level on the order of 76 dBA L_{eq} at a distance of 50 feet (FTA, 2006) without an enclosure. However, the presence of the concrete enclosure would be expected to provide a minimum of 20 dB of attenuation. Operation of the new pump station would conservatively generate a noise level of approximately 56 dBA at 50 feet.

The nearest sensitive land uses to the proposed pump station consists of single-family residences located approximately 110 feet to the east. Assuming a 7.5 dB drop-off rate per doubling of distance, these single-family residences would be exposed to a noise level of 47 dBA L_{eq}. The area around the proposed pump station can be categorized as normal suburban residential. Typical noise levels within a normal suburban residential soundscape can range from 53 to 57 dBA L_{dn} (USEPA, 1974). Conservatively assuming that the pump station would operate continuously for a 24-hour period, the nearest single-family residences would be

exposed to a day-night noise level of 54 dBA L_{dn}, which would result in an ambient noise increase for an urban residential environmental of 3 dB.

As previously discussed in **Section 3.11.1.2** (**Effects of Noise on People)**, a 3 dB change is considered a just-perceivable and does not cause a human response. Assuming the soundscape in vicinity of the proposed Valley of the Moon ASR is consistent with a normal suburban residential environment, the single-family residences located approximately 110 feet to the east of the proposed pump station would not be exposed to noise levels that would be considered a substantial permanent increase over the existing ambient. Under CEQA, there would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

Sonoma Aquifer Storage and Recovery. The proposed Sonoma ASR well site is located within the jurisdiction of the Sonoma County Water Agency within an unincorporated area of Sonoma County. The proposed ASR well site would include the installation of one new pump station. The nearest sensitive land uses to the proposed pump station consists of single-family residences located approximately 550 feet south-east of the proposed pump station. Assuming a 7.5 dB drop-off rate per doubling of distance and reference noise level of 56 dBA L_{eq} from a distance of 50 feet, these single-family residences would be exposed to a noise level of 30 dBA L_{eq}.

The area around the proposed pump station can be categorized as normal suburban residential. Typical noise levels within a normal suburban residential soundscape can range from 53 to 57 dBA L_{dn} (USEPA, 1974). Conservatively assuming that the pump station would operate continuously for a 24-hour period, the nearest single-family residences would be exposed to a day-night noise level of 37 dBA L_{dn}, which is below ambient noise levels typical of a normal suburban residential environment. Therefore, the proposed pump station would not expose nearby sensitive land sues to noise levels that would be considered a substantial permanent increase over the existing ambient. Under CEQA, there would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

Storage Alternative

Mobile Noise Sources

Operation of the facilities within the jurisdiction of the Novato SD, Napa SD, City of Petaluma and SVSD would not require extensive operation and maintenance activities. The increase in employee and haul trips related to operation of these facilities, compared to existing conditions, would contribute incrementally to traffic noise along location roadways. For all programmatic project components, impacts associated with traffic-related noise during project operations would be less than significant. Under CEQA, there would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

Stationary Noise Sources

SVCSD

Seasonal Storage – Mulas Site – Pump Station. The Seasonal Storage project would require a pump station to serve on-site irrigation demands. The nearest sensitive land uses to the proposed pump station consists of single-family residences located approximately 3,100 feet east of the proposed pump station. Assuming a 7.5 dB drop-off rate per doubling of distance and reference noise level of 56 dBA L_{eq} from a distance of 50 feet, these single-family residences would be exposed to a noise level of 11 dBA L_{eq}.

The area around the proposed pump station can be categorized as normal suburban residential. Typical noise levels within a normal suburban residential soundscape can range from 53 to 57 dBA L_{dn} (USEPA, 1974). Conservatively assuming that the pump station would operate continuously for a 24-hour period, the nearest single-family residences would be exposed to a day-night noise level of 17 dBA L_{dn}, which is below ambient noise levels typical of a normal suburban residential environment. Therefore, the proposed pump station would not expose nearby sensitive land sues to noise levels that would be considered a substantial permanent increase over the existing ambient. Under CEQA, there would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

Napa SD

Jameson Ranch Site - Pump Station. The Storage Alternative would include a new recycled-water pump station to convey stored recycled water from the ponds into the existing recycled water distribution system to serve the golf courses. The nearest sensitive land use to the proposed pump station is the Springhill Suites hotel located approximately 2,500 feet west-southwest of the proposed pump station. Assuming a 7.5 dB drop-off rate per doubling of distance and reference noise level of 56 dBA L_{eq} from a distance of 50 feet, the hotel would be exposed to a noise level of 14 dBA L_{eq}.

The area around the proposed pump station and hotel can be categorized as open space and light industrial. Typical noise levels at land uses such as these can be expected to be as low as the 40 dBA range; however, the heavily travelled State Route 12 is immediately south of the hotel, which raises the ambient noise level in the vicinity of the hotel considerably. Conservatively

assuming that the pump station would operate continuously for a 24-hour period, the hotel would be exposed to a day-night noise level of 20 dBA L_{dn}, which is below ambient noise levels in the area. Therefore, the proposed pump station would not expose this nearby sensitive land use to noise levels that would be considered a substantial permanent increase over the existing ambient. Under CEQA, the impact would be **less than significant** with respect to substantial permanent increase in ambient noise levels during project operation.

All Other Proposed Facilities

Stationary noise sources such as pumps stations are not proposed at any of the other proposed facilities. Therefore, there would be no increases in ambient noise levels from stationary noise sources at all other facilities and the impact would be **less than significant**.

Mitigation Measure

None required.

Impact Significance: Less than Significant.

Impact 3.11.5: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operations. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** resulting from excess noise levels under the No Project Alternative.

None of the projects under the No Action Alternative would result in a violation of their respective jurisdiction's noise standards. Under CEQA, there would be **less than significant** with respect to violation of standards established in local general plans, noise ordinances, or applicable standards of other agencies during operations.

Proposed Action

As described in Impact 3.11.4, noise from pump station operations would be attenuated by enclosures. Operation of well pumps would conservatively generate a noise level of approximately 56 dBA at 50 feet (FTA, 2006).

MMWD

San Quentin Prison Recycled Water Distribution System – Pump Station. The San Quentin Prison Recycled Water Distribution System project is located within an unincorporated area of Marin County. The Marin County Countywide Plan restricts stationary noise sources to 50 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). As previously discussed under Impact 3.11.4, the nearest sensitive land use to the proposed pump station would be exposed to a noise level of 33 dBA L_{eq}, which is below Marin County's daytime and nighttime stationary noise standards. Under CEQA, there would be **less than significant** with respect to violation of standards established in local general plans, noise ordinances, or applicable standards of other agencies during operations.

All Other Proposed Facilities

Stationary noise sources such as pump stations are not proposed at any other of the proposed facilities. Since all other facilities would not contain any sources of noise regulated by any general plans or noise ordinances in their respective jurisdictions, noise generated at these facilities would result in a **less than significant** impact.

Program Elements

Six additional projects are evaluated at a programmatic level because they are currently conceptual and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in unincorporated Sonoma County for City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in City of Sonoma for the SCWA.

Sonoma County Water Agency

Valley of the Moon Aquifer Storage and Recovery. The proposed Valley of the Moon ASR well site is located within an unincorporated area of Sonoma County. The Sonoma County General Plan 2020 restricts stationary noise sources to 50 dBA L_{50} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{50} during the nighttime hours (10:00 p.m. to 7:00 a.m.). As previously discussed under Impact 3.11.4, the nearest sensitive land use to the proposed pump station would be exposed to pump station noise level as high as 59 dBA L_{eq}. When there are no significant fluctuations, the L_{eq} should approximate the L_{50} value.

Assuming no fluctuations in noise generated by the proposed pump station, the pump station would expose the nearest sensitive receptor to a noise level of 47 dBA L_{50}, which is above the Sonoma County's nighttime stationary noise standards. Under CEQA, there would be a **significan**t impact with respect to violating standards established in local general plans, noise ordinances, or applicable standards. However, with the implementation of **Mitigation Measure 3.11-5**, which requires an acoustical analysis and appropriate mitigation, such as enclosure, to maintain compliance with applicable noise ordinances, the impact would be **less than significant with mitigation**.

Sonoma Aquifer Storage and Recovery. The proposed Sonoma ASR well site is located within the jurisdiction of the City of Sonoma. The City of Sonoma's Municipal Code Chapter 9.56 restricts exterior noise levels (constant) at residential property zones to 50 dBA L_{eq} during the daytime hours and 40 dBA L_{eq} during the nighttime hours. As previously discussed under Impact 3.11.4, the nearest sensitive land use to the proposed pump station would be exposed to pump station noise level as high as 30 dBA L_{eq}. The nearest sensitive land use to the proposed pump station would not be exposed to noise levels that would exceed either the City of Sonoma daytime or nighttime noise standards. Under CEQA, there would be less than significant with respect to violation of standards established in local general plans, noise ordinances, or applicable standards of other agencies during operations.

Storage Alternative

SVCSD

Seasonal Storage – Mulas Site – Pump Station. The proposed project would be located within an unaspirated area of the County of Sonoma. The County of Sonoma General Plan Noise Element has a daytime and nighttime noise standard of 50 dBA L_{50} and 45 dBA L_{50}, respectively. As previously discussed under Impact 3.11.4, the nearest sensitive land use to the proposed pump station would be exposed to pump station noise level as high as 11 dBA L_{eq}. The nearest sensitive land use to the proposed pump station would not be exposed to noise levels that would exceed either the City of Sonoma daytime or nighttime noise standards. Under CEQA, there would be **less than significant** with respect to violation of standards established in local general plans, noise ordinances, or applicable standards of other agencies during operations.

Napa SD

Jameson Ranch Site - Pump Station. The Storage Alternative would include a new recycled-water pump station to convey stored recycled water from the ponds into the existing recycled water distribution system to serve the golf courses. These projects would be located within an unincorporated area of Napa County. As discussed in Appendix 3.11, the Napa County General Plan noise element has daytime and nighttime noise standards of 50 dBA L_{50} and 45 dBA L_{50}, respectively, for rural areas. As previously discussed under Impact 3.11.4, the nearest sensitive land use to the proposed pump station would be exposed to pump station noise at a level as high as 14 dBA L_{eq}. The nearest sensitive land use to the proposed pump station would not be exposed to noise levels that would exceed either the Napa County daytime or nighttime noise standards. Under CEQA, the impact would be **less than significant** with respect to violation of standards established in local general plans, noise ordinances, or applicable standards of other agencies during operations.

All Other Proposed Facilities

Stationary noise sources such as pumps stations are not proposed at any of the other proposed facilities. Therefore, there would be no increases in ambient noise levels from stationary noise sources at all other facilities and the impact is **less than significant**.

Mitigation Measure

Mitigation Measure 3.11-4 *applies to the Valley of the Moon ASR well site.*

> **Mitigation Measure 3.11-4: Stationary -Source Noise Controls.**
>
> The applicant applicable Member Agency shall retain an acoustical engineer to design stationary -source noise controls and ensure the applicable noise standards are met. Prior to operations of the stationary noise source, the applicable Member Agency shall conduct a single 24-hour noise monitoring survey to ensure compliance with local noise standards.

Impact Significance after Mitigation: Less than Significant.

3.11.3.5 Impact Summary by Service Area

Appendix 3.11B provides a summary of potential Project impacts per Member Agency related to noise.

3.12 Hazards and Hazardous Materials

This section describes the existing conditions in the project area relating to hazards and hazardous materials in Section 3.12.1, *Affected Environment*. Section 3.12.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. Note that relative to hazards and hazardous materials, all NBWRP Phase 2 components, whether at the project or programmatic level, are analyzed at the project level within this section. The analysis of *Cumulative Impacts* is found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.12A. No comments or other input were received during the scoping period for this EIR/EIS regarding hazards and hazardous materials.

3.12.1 Affected Environment

Materials and waste are considered hazardous based on four characteristics: toxicity (if they are poisonous), ignitability (can be ignited), corrosivity (corrode other materials), or reactivity (react violently, explode, or generate vapors when mixed with air, water, or other substances). According to the California Health and Safety Code (Section 25501), "hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials released during past industrial and commercial operations could be encountered during excavation for elements of NBWRP Phase 2 (i.e., pipelines, pump stations), and require proper handling, transport, and disposal. In addition, chemicals used at the wastewater treatment plants (WWTPs) associated with NBWRP Phase 2 may be considered hazardous materials and would be subject to appropriate regulations.

3.12.1.1 Hazardous Materials Sites

Land use within the project area is a mix of agriculture and open space in the rural areas and commercial, industrial, and residential use in the urban areas, which primarily surround the cities of San Rafael, Novato, Petaluma, Sonoma, American Canyon, and Napa. Agricultural operations involve the use of petroleum fuels, pesticides, and fertilizers. Pesticides and fertilizers are applied directly to the soil and/or crops, and potential releases of petroleum fuels and oils can occur through spills and leaks from equipment and/or storage tanks. Commercial and industrial operations have the potential to release hazardous materials to soil and groundwater within the project area. Potential sources include gasoline service stations and industries that use solvents or other hazardous materials (e.g., dry cleaners). Residential land use can also result in the release of hazardous materials.

A regulatory database search of properties was conducted using the combined State Water Resources Control Board (SWRCB) GeoTracker and the Department of Toxic Substances Control (DTSC) EnviroStor websites to identify the nearest hazardous materials sites. The combined websites list active and closed hazardous materials release sites, land disposal sites, and sites permitted to use hazardous materials. In general, only hazardous materials release sites within about one-eighth mile (approximately 660 feet) of project components have the potential to affect a given project component. This is because spills tend to be largely contained to the release site or the immediately adjacent properties, or migrate downwards to groundwater out of reach of most of the NBWRP Phase 2 elements.

The database search focused on sites with documented hazardous materials releases that are still undergoing investigation and cleanup. Sites that use and/or store hazardous materials but have no records of spills or violations are not considered further since those sites would not be able to affect the NBWRP Phase 2 elements. Facilities or sites that have been closed following remediation and the remediation effort to the satisfaction of the regulatory agency overseeing the effort are not discussed further in this section since they have been cleaned up. The results of the database search are the active hazardous materials release sites discussed below and organized by project area.

Novato SD

Three active hazardous materials release sites are located about 3,500 feet west of the Novato SD elements, as discussed below.

1. The extent of dry cleaning solvents in groundwater from the former Seven to Seven Cleaners at 1432 South Novato Boulevard is largely limited to the site and does not extend to the location of the Novato Sanitary District project components (CCA 2017). The responsible party has requested site closure from the regulatory agency indicating that cleanup is close to completion.
2. The extent of gasoline in groundwater from the Mobil service station at 1400 South Novato Boulevard is largely limited to the site and does not extend to the Novato Sanitary District project components (Kleinfelder 2017). Site cleanup is ongoing.
3. The extent of gasoline in groundwater from the Shell service station located at 1390 Novato Boulevard South Boulevard is largely limited to the site and does not extend to the Novato Sanitary District projects (RWQCB 2016). This site has an active regulatory agency status but has completed cleanup activities. The site is eligible for closure once the site wells have been destroyed.

SVCSD

The closest hazardous materials release site is the Four Corners Service Station located at 20500 Broadway, about 2,800 feet west of the SVCSD elements (ECA 2017b). Leaking USTs were previously removed and the site is undergoing cleanup. The direction of groundwater flow is to the south, not towards the SVCSD elements.

SCWA

The closest hazardous materials release site is the Bonneau's at Grove site at 19080 Arnold Drive, a UST cleanup site where the former leaking USTs were removed, soil and groundwater cleanup has been completed, and the site has met the requirements for site closure pending removal of associated wells (SCDHS 2016a). Consequently, this site, located about 1,500 feet southwest of the SCWA elements, no longer poses any risk to nearby properties.

MMWD

Three hazardous materials release sites are located near the MMWD elements.

1. The extent of dry cleaning solvents in groundwater from the San Quentin State Prison Dry Cleaner Area inside the prison is largely limited to the site, ending about 550 feet north of the proposed pipeline alignment (SHN 2017). The release is being treated using monitored natural attenuation. Using natural attenuation as a cleanup method is applied to sites where the extent of the plume is stable or deceasing.
2. Two former landfills are located just north of Interstate 580: the former San Quentin Solid Waste District Closed Landfill (CSS 2016a) and the former Bayview Business Park-Horst Hanf Landfill (CSS 2016b). The MMWD pipeline alignment would end at least 750 feet to the south. Neither landfill accepted hazardous waste when open and neither landfill has plumes of contaminated groundwater that extend to the proposed pipeline alignments.

As discussed above, the extent of contaminants from these sites do not extend to the location of MMWD elements.

Napa SD

The closest hazardous materials release site is the Napa State Hospital - California Department of Mental Health at 2100 Napa-Vallejo Highway, about 700 feet north of Sycamore Drive part of Napa SD pipeline (Cardno 2010). This is a diesel fuel leak site where leaking pipelines were replaced. Investigation and cleanup activities indicate the leak is largely limited to the site and groundwater contamination does not extend to the Napa SD pipeline elements.

Petaluma

The following 13 active hazardous materials release sites are located near the City of Petaluma sites.

The following seven active hazardous materials release sites are located along East Washington Street.

1. The extent of dry cleaning solvents in groundwater from the Plaza Cleaners at 101-182 North McDowell Boulevard is largely limited to the site, does not extend to Highway 101, and does not extend to the location of the City of Petaluma project components, located about 2,875 feet to the southwest (Partner 2015). Site cleanup is ongoing.
2. The extent of gasoline in groundwater from the ARCO service station at 101 North McDowell Boulevard is largely limited to the site, does not extend to Highway 101, and does not extend to the location of the City of Petaluma project components, located about 3,200 feet to the southwest (Stantec 2017a). Site cleanup is ongoing.
3. The extent of gasoline in groundwater from the 7-Eleven Store at 201 South McDowell Boulevard is largely limited to the site, does not extend to Highway 101, and does not extend to the location of the City of Petaluma project components, located about 3,400 feet to the southwest (Stantec 2017b). Site cleanup is ongoing.
4. The extent of gasoline in groundwater from the Chevron service station at 1440 East Washington Street is largely limited to the site, does not extend to Highway 101, and does not extend to the location of the City of Petaluma project components, located about 3,800 feet to the southwest (GHD 2017). Site cleanup is ongoing.
5. The plume of gasoline in groundwater from the Shell service station at 801 East Washington Street flows to the southwest, away from the City of Petaluma pipelines along Ellis Street about 700 feet to the northeast (AECOM 2017). Site cleanup is ongoing.
6. Soil was contaminated with gasoline leaked from an underground storage tank (UST) sometime before June of 1997 at the Sonoma-Marin Fairgrounds at 100 Gnoss Concourse. Soil was reportedly removed and treated (DTSC 1997). No orders were issued by the regulatory agency indicating the agency did not conclude further action was needed.
7. Gasoline was leaked from the former fire station UST at the Joseph Ellwood Community Center at 301 Payran Street to soil and groundwater. However, the flow direction is to the south, not toward the components of the City of Petaluma project (ECA 2017a). Site cleanup is ongoing.

The following two active hazardous materials release sites are located near the intersection of Lindberg Lane and Kenilworth Drive in Petaluma.

1. Soil was contaminated by fuel and motor oil from maintenance activities at the former city maintenance yard at 991 Lindberg Lane (EGS 2014). Soil excavation was conducted in 2005 and 2014. Confirmation sampling conducted in the 2014 excavation did not detect fuel or motor oil, and groundwater was not encountered.
2. Soil and groundwater was contaminated with gasoline from USTs previously removed from the Petaluma School Bus Yard at 993 Lindberg Lane (EGS 2017). The extent of residual fuel in soil and groundwater is largely limited to the site and the direction of groundwater flow is to the southwest, away from the components of the City of Petaluma project. The responsible party and the regulatory agency are discussing land use restrictions.

The following four listed active hazardous materials release sites are located along Highway 116/Lakeville Highway.

1. Although listed as active on the SWRCB GeoTracker website, the case for the Metron Super Gas at 910 Baywood Drive is in the process of being closed (SCDHS 2016b). The regulatory agency will close the case once the site wells have been destroyed. This site does not pose a risk to nearby properties.
2. Although listed on the DTSC EnviroStor website, the Sola Optical USA, Inc. site at 3600 Lakeville Highway is a former Superfund site that was delisted in 2013, meaning the site has been cleaned up to the satisfaction of the regulatory agencies and does not pose a risk to nearby properties (US EPA 2013).
3. Gasoline is present in groundwater released from three USTs removed in 1994 from the Lakeville Service Station at 5100 Lakeville Highway (Innovex 2017). Soil and groundwater cleanup has been conducted and the site is in post-remediation monitoring. The depth to groundwater is about 8 to 16 feet below ground surface (bgs). Gasoline is present in groundwater that extends across Lakeville Highway. The proposed pipeline alignment is adjacent to this site and crosses over this plume.
4. The JLT Ranch is an inactive site at 601 Stage Gulch Road where a spill of ammonia was reported in 1965 (RWQCB 2015). Although no records of investigation or cleanup are known, the site is unlikely to pose a risk given the nature of the spill (ammonia is volatile) and the length of time since the spill (over 25 years). The site is about 2,000 feet north of the City of Petaluma project components.

American Canyon

The following five active hazardous materials release sites are located near the American Canyon elements, as discussed below.

1. An unspecified Caltrans site is listed at Highway 12 and Kelly Road. This 2009 case is listed but has had no history of investigation or cleanup, suggesting a minor incident unlikely to affect nearby sites (RWQCB 2009).
2. The listing for Asbury Environmental Services at 800 Tower Road is for the clean closure of a Resource Conservation and Recovery Act (RCRA) facility, a facility that used hazardous materials but has no recorded releases (DTSC 2016).
3. The Caltrans Route 29 Post Mile 1.13 site at 3466 Broadway on Highway 29 is the location of four previously unknown USTs discovered during the repair of the sewer main (GeoCon 2015). The USTs were removed in 2015 and investigation is ongoing. Soil and groundwater have been contaminated with gasoline and extend across the proposed alignment of the proposed American Canyon Water Reclamation Facility (American Canyon WRF) pipeline alignment. The depth the groundwater was about 4.5 feet during the UST removals in February, 2015. No further investigation or cleanup work is documented and the extent of soil and groundwater contamination is unknown.
4. The American Canyon Elementary School site at the intersection of American Canyon Road and Broadway Street is a school siting investigation for a potential future school site (DTSC 2003). Soil was tested for organochlorine pesticides, metals, benzene, toluene, ethylbenzene, xylenes, methyl tertiary butyl ether (MTBE), and volatile organic compounds (VOC). All constituents were at concentrations below action levels or detection levels.
5. The American Canyon High School site at the intersection of American Canyon Road and Flosden Road is a school siting investigation for a possible school site (DTSC 2012). The site was tested for lead based paint, naturally occurring asbestos (NOA), and pesticide and metal sampling due to former agricultural practices on the site. Some NOA-containing roadbase material is limited to the area around the former residence and barn structures and the access road leading up to the structures, while NOA containing stream deposits were identified to exist southeast of the former residence. This site is located about 2,250 feet north northwest of the American Canyon WRF pipeline alignment.

3.12.1.2 Hazards

Nearby Schools

The CEQA guidance requires considering the potential impacts on schools within one-quarter mile of NBWRP Phase 2 elements.

The following two schools are within one-quarter mile of the Petaluma elements:

1. Corona Creek Elementary School, 1851 Hartman Lane, Petaluma
2. Kenilworth Junior High School, 800 Riesling Road, Petaluma

The following three schools are within one-quarter mile of the American Canyon elements:

1. Napa Valley Montessori Learning Center, 120 West American Canyon Road, American Canyon
2. Williams Pre-School, 15 Poco Way, American Canyon
3. Napa Junction Magnet Elementary School, 300 Napa Junction Road, American Canyon

There are no schools within one-quarter mile of the NBWRP Phase 2 elements for Novato SD, MMWD, SVCSD, Napa SD, or SCWA.

Nearby Airports and Airstrips

The CEQA guidance requires considering the potential impacts relative to airports and airstrips within two miles of any NBWRP Phase 2 element.

The Petaluma Municipal Airport is a general aviation airport located at 601 Sky Ranch Drive in Petaluma is within two miles of City of Petaluma project components. The northwest end of the runway is within 0.6 mile of the pipeline alignment at Castle Drive. The proposed pipeline is close to beneath the takeoff and landing alignment.

The Sonoma Skypark is a general aviation airport located at 21870 8th Street East in Sonoma is within two miles of SVCSD elements. The runway is oriented east to west, parallel to the Napa Road pipeline alignment located about one mile to the north. It is not within the takeoff and landing alignment.

The Napa County Airport is a general aviation airport located at 2030 Airport Road between Napa and American Canyon located just west of the Tower Road portion of one of the City of American Canyon's elements. Takeoffs and landings on Runway 24 would pass over the Tower Road elements.

There are no airports or air strips within two miles of the NBWRP Phase 2 elements for the Novato SD, MMWD, Napa SD, or SCWA.

Emergency Response Plans and Emergency Evacuation Routes

The CEQA guidance requires considering the potential impacts on emergency response plans and emergency evacuation routes due to the construction and operation of project site components. None of the areas discussed below have specifically-identified evacuation routes. The setting information below identifies highways, arterial roads, and major collector roads that overlap proposed action components based on California Road System maps (Caltrans 2011 to 2013).

1. **Novato SD** – The section of Delong Avenue west of Highway 101 is classified as a principal arterial road. Rowland Way where it crosses Novato Creek is classified as major collector road.
2. **MMWD** – Sir Francis Drake Boulevard is a principal arterial road.
3. **City of Petaluma** – Highway 116/Lakeville Highway is an arterial roadway. Some pipeline alignments cross McDowell Boulevard, which is an arterial road. Some pipeline alignments cross Sonoma Mountain Parkway and Ely Road, which are major collector roads.
4. **SVCSD** – Napa Road transitions from a principal arterial road from 5th Street East to 8th Street East, to a major collector road east of 8th Street East.
5. **City of American Canyon** – Highway 29 is a state highway.
6. **Napa SD** – This pipeline alignment does not overlap a highway, arterial road, or major collector road.
7. **SCWA** – One pipeline alignment crosses 1st Street West, an arterial road. Verano Avenue is a major collector road.

Wildland Fires

The California Department of Forestry prepares and provides fire hazard severity mapping for both state (SRA) and local (LRA) area responsibilities. The fire hazard severity zone designations in the areas of the project components are listed below. Note that the SRA and LRA designation terminologies are slightly different.

The NBWRP Phase 2 elements for the MMWD are within a moderate fire hazard severity zone (Calfire 2007).

The elements for Petaluma within the city limits are not within a very high fire hazard severity zone (Calfire 2008). The project components along Highway 116/Lakeville Highway are within a moderate to high fire hazard severity zone (Calfire 2007).

The elements for the following areas are not within a very high fire hazard severity zone (Calfire 2008):

1. Novato SD
2. SVCSD
3. American Canyon
4. Napa SD
5. SCWA

3.12.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Hazards and Hazardous Material issues and used to determine the significant criteria present in Section 3.12.1 is found in **Appendix 3.12A**.

3.12.3 Direct and Indirect Effects

3.12.3.1 Significance Criteria under CEQA

Based on the Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant impact related to hazards and hazardous materials if it would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
2. Create a significant hazard to the public or the environment through foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
4. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;
6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area;
7. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
8. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

NBWRP Phase 2 and its alternatives would have no impact related to the following considerations identified in Appendix G of the CEQA Guidelines. Because neither NBWRP Phase 2 nor any of the alternatives would result in any direct or indirect impact related to these considerations, none could cause or contribute to any cumulative impact. Therefore, these considerations are not addressed further in this section.

1. With oversight by the local CUPA, each WWTP associated with NBWRP Phase 2 has developed a Hazardous Materials Business Plan that includes an Emergency Response Plan and inventory of hazardous materials that are handled and stored onsite. Policies and procedures for emergency response are also established in the local general plans relevant to the project area, as described in Appendix 3.12A, *Regulatory Framework*. Compliance with these existing regulations, plans, policies, and procedures during construction and operation would ensure that NBWRP Phase 2 will not create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during operations, nor impair implementation of or physically interfere with adopted emergency response plans. Therefore, there would be no impacts related to these issues.
2. Construction activities associated with treatment plant upgrades would not involve substantial excavation as to increase exposure to contaminated soil or groundwater that would trigger Significance Criteria 1, 2, and 3. Therefore, NBWRP Phase 2 would not result in any impacts from exposure to hazardous materials released from contaminated soil and groundwater.

3.12.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD with 1.8 miles of distribution pipelines, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Recycling Facility (WRF), and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.12.1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction. (Less than Significant)

During the construction of pipelines, pump stations, storage facilities, water treatment facility expansions, and aquifer storage and recovery (ASR) wells, construction equipment and materials could include fuels (e.g., gasoline and diesel fuel), oils and lubricants, solvents and cleaners, degreasers, adhesives and cements, paints and thinners, which are all commonly used in construction. Routine use or reasonably foreseeable accident conditions could result in inadvertent releases of small quantities of hazardous materials, which could adversely affect construction workers, soil, and/or surface water.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

All of the projects under the No Action Alternative would have a **less than significant** impact during construction through the proper transport, use, containment, storage, and disposal of hazardous materials.

Proposed Action

Construction activities would be required to comply with federal, state, and local hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials that could affect workers, soil, and/or stormwater and downstream receiving water bodies.

Contractors would be required to prepare and implement HMBPs that would require that hazardous materials used for construction would be used properly and stored in appropriate containers with secondary containment to contain a potential release. In addition, the transportation of hazardous materials would be regulated by the USDOT, Caltrans, and the CHP. Together, federal and state agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release.

Finally, as discussed in **Section 3.5, *Water Quality***, construction contractors would be required to prepare a SWPPP for construction activities according to the NPDES General Construction Permit requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction and describe spill prevention measures, equipment inspections, equipment and fuel storage, and protocols for responding immediately to spills.

Through compliance with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations, impacts associated with potential releases from the routine transport, use, or disposal or the accidental release of hazardous materials during construction would be **less than significant** for all elements of the Proposed Action.

Upon completion of the construction activities, the operations would consist of the transport of recycled water through pipelines and to storage tanks and to end users. The use of hazardous materials for maintenance activities would require small amounts, used sporadically, and used in accordance with all regulatory guidance.

Program Elements

Like the Proposed Action, the Program Elements would be required to comply with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations. Therefore, impacts associated with potential releases from the routine transport, use, or disposal or the accidental release of hazardous materials during construction would be **less than significant** for all elements of the Proposed Action.

Upon completion of the construction activities, the operations would consist of the transport of recycled water through pipelines and to storage tanks and to end users. No hazardous materials would be used.

Storage Alternative

The elements of the Storage Alternative would be required to comply with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations. Therefore, impacts associated with potential releases from the routine transport, use, disposal, or the accidental release of hazardous materials during construction would be **less than significant** for all elements of the Proposed Action.

Upon completion of the construction activities, the operations would consist of the transport of recycled water through pipelines and to storage tanks and to end users. The use of hazardous materials for maintenance activities would require small amounts, used sporadically, and used in accordance with all regulatory guidance.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.12.2: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. (Less than Significant with Mitigation)

As discussed in Impact 3.12.1, construction equipment and materials could include fuels (e.g., gasoline and diesel fuel), oils and lubricants, solvents and cleaners, degreasers, adhesives and cements, paints and thinners, which are all commonly used in construction. The use of these chemicals could result in the release of hazardous emissions materials within one-quarter mile of a school.

Implementation of the NBWRP Phase 2 elements would involve the storage and use of chemicals such as coagulants or flocculants and disinfection agents (e.g., polymers, alum, and sodium bisulfite) associated with the treatment upgrades and oil and lubricants at the proposed pump stations. Accidental release of the stored chemicals during use or storage could adversely affect the environment and/or the public. However, the chemicals that would be handled during project operation are not considered acutely hazardous by the USEPA (40 CFR Part 355 Section 302 and 304). The chemicals would be stored in aboveground storage tanks with secondary containment, in accordance with federal, state, and local requirements and precautions would be taken to prevent and control any spills that may occur. The Member Agencies would comply with the provisions of California Code of Regulations, Title 8, Sections 5163 through 5167 for General Industry Safety Orders to protect the action area from being contaminated by the accidental release of any hazardous materials and/or wastes. The Member Agencies would contact the CUPA, local fire agency and the County Department of Public Health, Environmental Health Division for any site-specific requirements regarding hazardous materials or hazardous waste containment or handling. Disposal of all hazardous materials would be in compliance with the applicable California hazardous waste disposal regulations. The Member Agencies would prepare or update their existing Hazardous Materials Business Plans and/or Emergency Response Plan to include any new chemicals that would be handled during project operation. Regulatory compliance and hazardous materials management practices would ensure a less than significant impact. Project operation would continue to take place in a controlled, industrial environment, and accidental exposure to hazardous materials would be minimized by compliance with applicable laws and regulations. There would be no new chemical storage or use associated with pipelines.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, each of the projects would have **less than significant** impact**s** through compliance and proper regulation of hazardous materials within one-quarter mile of schools.

Proposed Action

As noted in Section 3.12.1.2 *Hazards*, there are two schools in the City of Petaluma and three schools in the City of American Canyon that are located within one-quarter mile of elements of the Proposed Action. Two schools – Bernard Eldridge Elementary School (Petaluma) and American Canyon Middle School – are located adjacent to these elements. The construction activities for the Proposed Action would require construction traffic to travel on routes that would border these schools. To address this potential impact, **Mitigation Measure 3.8.1b** presented in Section 3.8 *Transportation and Traffic* requires the construction contractor to notify affected schools to coordinate construction activities with student pick-up/drop-off and other activities. As discussed above in Impact 3.12.1, construction activities would be required to comply with federal, state, and local hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker (and by extension school children) safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials that could affect school children. Through compliance with applicable hazardous materials storage, transportation, use, and disposal regulations, stormwater permitting regulations, and Mitigation Measure 3.8.1b [in American Canyon and Petaluma], impacts associated with the use of hazardous materials near schools would be **less than significant with mitigation** for the Proposed Action.

Program Elements

Like the Proposed Action, the Program Elements within one-quarter mile of an existing or proposed school site would be required to comply with all federal, state, and local hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker (and by extension school children) safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials that could affect school children. Through compliance with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations, impacts associated with the use of hazardous materials near schools would be **less than significant** for NBWRP Phase 2.

Storage Alternative

The Storage Alternative include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. The elements of the Storage Alternative within one-quarter mile of an existing or proposed school site would be required to comply with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations. Therefore, impacts associated with potential releases from the routine transport, use, or disposal, or the accidental release of hazardous materials during construction would be **less than significant** for all elements of the Storage Alternatives within one-quarter mile of an existing or proposed school site.

Upon completion of the construction activities, the operations would consist of the transport of recycled water through pipelines and to storage tanks and to end users. The use of hazardous materials for maintenance activities would require small amounts, used sporadically, and used in accordance with all regulatory guidance.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.12.3: Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment. (Less than Significant with Mitigation)

The proposed action involves excavation, trenching, drilling, and grading for the construction of water conveyance pipelines, pump stations, storage facilities, water treatment facility expansions, and ASR wells. The construction of project components on contaminated sites listed on Government Code Section 65962 could result in disturbing contaminated soil and expose construction workers, the public, and the environment to contaminated materials.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

None of these elements under the No Action Alternative are located in proximity of listed hazardous sites. Therefore, there would be **no impact**.

Proposed Action

As listed in Section 3.12.1.1 *Hazardous Materials Sites*, the following two elements of the Proposed Action would be located on or potentially encounter contaminated soil from a listed hazardous materials site:

1. **City of Petaluma** – The Lakeville Service Station site is located at 5100 Lakeville Highway, adjacent and just east of the proposed pipeline alignment. Contamination is known to extent across the highway and the excavation of soil may encounter soil contaminated with gasoline.
2. **City of American Canyon** – The Caltrans Route 29 Post Mile 1.13 site is located at 3466 Broadway on Highway 29. The proposed pipeline alignment would pass adjacent and just west of the Mile Post 1.13 site. The extent of soil contaminated with gasoline is unknown and may extend across the proposed pipeline alignment.

The potential for contaminated soil to be released into the environment during project construction would be considered a significant impact.

Impacts resulting from the potential release of or exposure to hazardous materials in soil would be reduced to less-than-significant with implementation of **Mitigation Measures 3.12-3a Health and Safety Plan** and **3.13-3b Soil Management Plan**. **Mitigation Measure 3.12-3a** would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations. The plan would specify personal protective equipment for workers, outline construction measures to reduce the

potential for workers' exposures to hazardous materials in soil, and describe procedures for handling accidental hazardous materials releases and unanticipated contamination. **Mitigation Measure 3.12-3b** requires construction contractors to comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil. With implementation of **Mitigation Measures 3.12-3a** and **3.12-3b**, the potential for harmful exposure to hazardous materials present in soil during pipeline and other conveyance construction would be reduced to **less than significant with mitigation**. The mitigation measures are described further below.

Program Elements

As listed in Section 3.12.1.1 *Hazardous Materials Sites*, no Program Elements would be located on or potentially encounter contaminated soil from a listed hazardous materials site. Therefore, there would be **no impact** relative to listed hazardous sites and NBWRP Phase 2.

Storage Alternative

None of these elements are located in proximity of listed hazardous sites. Therefore, there would be no impact.

Mitigation Measures

***Mitigation Measures 3.12-3a** and **3.12-3b** apply to all project components.*

Mitigation Measure 3.12-3a: Health and Safety Plan.

The construction contractor(s) shall prepare and implement a site-specific Health and Safety Plan as required by and in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. The Health and Safety Plan shall include, but is not limited to, the following elements:

1. Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site health and safety plan;
2. A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals;
3. Specified personal protective equipment and decontamination procedures, if needed;
4. Emergency procedures, including route to the nearest hospital; and
5. Procedures to be followed in the event that evidence of potential soil contamination (such as soil staining, noxious odors, debris or buried containers) is encountered. These procedures shall be in accordance with hazardous waste operations regulations and specifically include, but are not limited to, the following: immediately stopping work in the vicinity of the unknown hazardous materials release, notifying the appropriate regulatory agency, and retaining a qualified environmental firm to perform sampling and remediation, as needed.

Mitigation Measure 3.12-3b: Soil and Groundwater Management Plan.

In support of the Health and Safety Plan described above, the construction contractor(s) shall develop and implement a Soil Management Plan that includes materials testing and disposal procedures specifying how the construction contractor will remove, handle, transport, and dispose of all excavated material in a safe, appropriate, and lawful manner. The plan shall identify protocols for soil testing, list action levels[1] to determine whether the soil may be reused or must be disposed of at an offsite facility permitted to accept the materials, identify the approved disposal site, and include written documentation that the disposal site will accept the waste. Contract specifications shall mandate full compliance with all applicable local, state, and federal regulations related to the identification, transportation, and disposal of hazardous materials, including those encountered in excavated soil.

Impact Significance after Mitigation: Less than significant.

Impact 3.12.4: Be located within two miles of a public or private airport and result in a safety hazard for people residing or working in the project area. (No Impact)

The proposed action involves the construction of water conveyance pipelines, pump stations, storage facilities, water treatment facility expansions, and ASR wells. The placement of structures or equipment within the landing and takeoff flight paths could result in a safety hazard.

[1] Action levels would include San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels to identify soil requiring cleanup, and landfill hazardous and designated waste acceptance criteria.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, pipeline alignments that would be part of Petaluma's and American Canyon's would be within the landing and takeoff alignment of an airport runway. This analysis has determined that the construction equipment used to install these pipelines would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.

Proposed Action

As listed in Section 3.12.1.2 *Hazards*, the following Proposed Action elements would be located within the landing and takeoff alignment of an airport runway. **Table 3.12-1** identified impacts for the Proposed Actions and Program Elements.

1. **City of Petaluma** – The northwest end of the Petaluma Municipal Airport at 601 Sky Ranch Drive is within 0.6 mile of the Urban Recycle Water Expansion pipeline alignment at Castle Drive and close to beneath the takeoff and landing alignment. The pipeline alignment would be along a residential neighborhood and the construction equipment (e.g., excavator, dump truck) would not be higher than the surrounding homes. Using the formula promulgated under Federal Aviation Regulations Section 77.13, construction equipment at the closest location could be as high as 31.7 feet without violating the height restriction. The trenching equipment (e.g., an excavator, dump truck) would likely never exceed 10 feet in height. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.
2. **City of American Canyon** – The eastern end of Runway 6-24 of the Napa County Airport at 2030 Airport Road in Napa is located about 1,600 feet west of the Tower Road portion of an American Canyon Recycled Water Distribution System Expansion pipeline alignment. Takeoffs and landings on Runway 24 would pass over the Tower Road components. The pipeline alignment would be in an industrial area that currently has single story buildings and a semi-trailer storage yard. Using the formula promulgated under Federal Aviation Regulations Section 77.13, construction equipment at the closest location could be as high as 16 feet without violating the height restriction. The trenching equipment (e.g., an excavator, dump truck) would likely never exceed 10 feet in height. The construction equipment would also not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.

TABLE 3.12-1: PROPOSED ACTION ELEMENTS WITHIN TWO MILES OF AN AIRPORT

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	These proposed action components would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	As listed in Section 3.12.1.2, *Hazards*, the Proposed Action elements would be located within the landing and takeoff alignment of an airport runway. However, the construction equipment would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.
American Canyon WRF	American Canyon	
CMSA WRF	MMWD/CMSA	These proposed action components would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Pipeline Projects		
Marin County Lower Novato Creek	Marin Co.	These proposed action components would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	
MMWD San Quentin Pipeline	MMWD/CMSA	
Petaluma Urban Recycled Water	Petaluma	As listed in Section 3.12.1.2, *Hazards*, the Proposed Action elements would be located within the landing and takeoff alignment of an airport runway. However, the construction equipment would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	These proposed action components would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Napa SD Soscol Covered Storage	Napa SD	

TABLE 3.12-1: PROPOSED ACTION ELEMENTS WITHIN TWO MILES OF AN AIRPORT (CONTINUED)

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	No Program Elements would be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Napa SD Napa State Hospital Pipeline	Napa SD	
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	No Program Elements would be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	No Program Elements would be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
SCWA Potable Water ASR - Valley of the Moon	SCWA	
SCWA Potable Water ASR - Sonoma	SCWA	

Program Elements

No Program Elements would be located within the landing and takeoff alignment of an airport runway: Therefore, there would be **no impact** relative NBWRP Phase 2.

Storage Alternative

Table 3.12-2 identified potential impacts for the Storage Alternative. Construction equipment used to construct these elements would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with any airport flight path and there would be **no impact** attributable to the Storage Alternative.

TABLE 3.12-2: STORAGE ALTERNATIVE ELEMENTS WITHIN TWO MILES OF AN AIRPORT

Proposed Action	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	No Program Elements would be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	This analysis has determined that the construction equipment that would be used to construct these elements would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with any airport flight path and there would be **no impact** attributable to the Storage Alternative.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Elements would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.
Petaluma – Ellis Creek WRF Southeast	Petaluma	As listed in Section 3.12.1.2, *Hazards*, the Proposed Action elements would be located within the landing and takeoff alignment of an airport runway. However, the construction equipment would not be higher than the surrounding structures. Therefore, the construction equipment would not interfere with the airport flight path and there would be **no impact**.
Napa SD Jameson Ranch	Napa SD	
SVCSD Seasonal Storage - Mulas	SVCSD	Elements would not be located within the landing and takeoff alignment of an airport runway; therefore, there would be **no impact** under this criterion relative NBWRP Phase 2.

Mitigation Measures

None required.

Impact Significance: No Impact.

Impact 3.12.5: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan during construction. (Less than Significant with Mitigation)

Construction activities would occur within or adjacent to public roadways. The construction activities could interfere with emergency response services or an emergency evacuation if construction activities involve the complete or partial closure of roadways, otherwise restricted access for emergency response vehicles, or restrict access to critical facilities such as hospitals or fire stations. Construction activities could result in temporary lane closures on certain roads, increased traffic, and other roadway conditions that could interfere with or slow down emergency vehicle access and services. **Table 3.12-3** identified potential impacts for the Proposed Action and Program Elements.

TABLE 3.12-3: PROPOSED ACTION: EMERGENCY RESPONSE OR EVACUATION PLANS

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	Proposed action components would be constructed within existing facilities; therefore, such activities would not impair or interfere with an adopted emergency response plan. Impacts would be **less than significant**.
Napa SD Soscol WRF	Napa SD	
CMSA WRF	MMWD/CMSA	
American Canyon WRF	American Canyon	
Petaluma Ellis Creek WRF	Petaluma	
Pipeline Projects		
Marin County Lower Novato Creek	Marin Co.	Proposed action components would be constructed within or along the shoulders of public roadways. In some cases, the placement of equipment and the trenching activities would require the closure of one lane of roadway. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1**f, Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations, the potential for interference with emergency response services or an emergency evacuation during construction of any of the Phase 2 Program elements would be reduced to **less than significant with mitigation**.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	
MMWD San Quentin Pipeline	MMWD/CMSA	
Petaluma Urban Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	Proposed action components would not impair or interfere with an adopted emergency response plan. Impacts would be **less than significant**.
Napa SD Soscol Covered Storage	Napa SD	
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	Program elements would be constructed within or along the shoulders of public roadways. In some cases, the placement of equipment and the trenching activities would require the closure of one lane of roadway. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations, the potential for interference with emergency response services or an emergency evacuation during construction of any of the Program Elements would be reduced to **less than significant with mitigation**.
Napa SD Napa State Hospital Pipeline	Napa SD	
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Program elements would not impair or interfere with an adopted emergency response plan. Impacts would be **less than significant with mitigation**.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	
SCWA Potable Water ASR - Valley of the Moon	SCWA	
SCWA Potable Water ASR - Sonoma	SCWA	

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, impacts resulting from road closures or restrictions during construction would be reduced to less-than-significant with implementation of **Mitigation Measures 3.8-1a** through **3.8-1f** that would require the acquisition of encroachment permits, the preparation and implementation of Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, the potential for

interference with emergency response services or an emergency evacuation during construction of any of the Program Elements would be reduced to **less than significant with mitigation**. The mitigation measures are described in **Impact 3.8-1**.

Proposed Action

As described in Chapter 2, Project Description, various project components would be constructed within or along the shoulders of public roadways. In some cases, the placement of equipment and the trenching activities would require the closure of one lane of roadway.

As discussed in **Section 3.8, *Transportation and Traffic***, state (Caltrans) and local jurisdictions would require encroachment permits and the preparation and implementation of Traffic Control/Traffic Management Plans where road encroachments and closure would occur. Impacts resulting from the road closures or restrictions would be reduced to less-than-significant with mitigation with implementation of **Mitigation Measures 3.8-1a** through **3.8-1f** that would require the acquisition of encroachment permits, the preparation and implementation of Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, the potential for interference with emergency response services or an emergency evacuation during construction would be reduced to **less than significant with mitigation**. The mitigation measures are described in **Impact 3.8-1**.

Program Elements

The Program Elements would construct an 18-acre recycled water storage pond with associated pump station and piping (Novato SD), implement five restoration projects in the Lower Novato Creek Basin (Novato SD), construct an additional 11,300 LF of recycled water distribution pipeline to serve agricultural customers (Petaluma), additional operational storage with associated pump station and 4,800 LF of piping (Napa SD), and two aquifer storage and recovery (ASR) projects near Sonoma including a combined 2,000 LF of pipeline (SCWA).

As noted above, impacts resulting from the road closures or restrictions during construction would be reduced to less-than-significant with implementation of **Mitigation Measures 3.8-1a** through **3.8-1f** that would require the acquisition of encroachment permits, the preparation and implementation of Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, the potential for interference with emergency response services or an emergency evacuation during construction of any of the Program Elements would be reduced to **less than significant with mitigation**. The mitigation measures are described in **Impact 3.8-1**.

Storage Alternative

Table 3.12-4 identified potential impacts for the Storage Alternative. Impacts resulting from road closures or restrictions during construction would be reduced to less-than-significant with implementation of **Mitigation Measures 3.8-1a** through **3.8-1f** that would require the acquisition of encroachment permits, the preparation and implementation of Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, the potential for interference with emergency response services or an emergency evacuation during construction of any of the Program Elements would be reduced to **less than significant with mitigation**. The mitigation measures are described in **Impact 3.8-1**.

TABLE 3.12-4: STORAGE ALTERNATIVE: EMERGENCY RESPONSE OR EVACUATION PLANS

Proposed Action	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Proposed Action components would not impair or interfere with an adopted emergency response plan. Impacts would be **less than significant**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	Storage Alternative elements would be constructed within or along the shoulders of public roadways. In some cases, the placement of equipment and the trenching activities would require the closure of one lane of roadway. With implementation of **Mitigation Measures 3.8-1a** through **3.8-1f**, Traffic Control/Traffic Management Plans, and other measures in accordance with state and local regulations, the potential for interference with emergency response services or an emergency evacuation during construction of any of the Storage Alternative elements would be reduced to **less than significant with mitigation**.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Proposed Action components would not impair or interfere with an adopted emergency response plan. Impacts would **be less than significant with mitigation**.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Napa SD	
SVCSD Seasonal Storage - Mulas	SVCSD	

Mitigation Measures

Mitigation Measure 3.8-1a through 1f: The mitigation measures are described in **Impact 3.8-1** of **Section 3.8, *Transportation and Traffic***.

Impact Significance after Mitigation: Less than Significant.

Impact 3.12.6: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. (Less than Significant with Mitigation)

Portions of the NBWRP Phase 2 are located in rural and agricultural land that may be susceptible to wildland fires. In the case of the proposed components that would lie within areas with a wildland fire hazard, construction activities could expose people or equipment to risk of loss, injury, or death involving wildland fires.

Construction of water conveyance pipelines would occur in some areas designated as high fire hazard severity zones. The construction activities could result in wildfire if equipment with hot surfaces or lacking spark arresters comes into contact with dry brush or grass.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

The No Action Alternative elements would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be **no impact**.

Proposed Action

As discussed in Section 3.12.1.2, *Hazards*, most of the Proposed Action elements would be located outside of areas designated as high fire hazard severity areas. **Table 3.12-5** identified potential impacts for the Proposed Action and Program Elements. Areas susceptible to wildland fires include the following:

1. **MMWD:** The pipeline alignment is within a moderate fire hazard severity zone.
2. **City of Petaluma:** The pipeline alignment along Highway 116/Lakeville Highway is within a moderate to high fire hazard severity zone.

As discussed in Section 3.12.2 *Regulatory Framework*, state regulations require spark arrestors on off-road equipment, which would reduce the risk if starting a wildland fire to less than significant. In addition, compliance with the local plans to reduce fire hazards would be required. Finally, impacts resulting from wildfires would be reduced to less-than-significant with the implementation of **Mitigation Measure 3.12-6 Fire Safety Plan** that would require that construction contractors prepare and implement traffic control plan in accordance with local regulations for conducting work within the areas designated above as susceptible to wildland fires. With implementation of **Mitigation Measure 3.12-6**, the potential for wildland fires during construction of these Proposed Action components would be reduced to **less than significant with mitigation**. The mitigation measure is described further below.

Program Elements

The Program Elements would construct an 18-acre recycled water storage pond with associated pump station and piping (Novato SD), implement five restoration projects in the Lower Novato Creek Basin (Novato SD), construct an additional 11,300 LF of recycled water distribution pipeline to serve agricultural customers (Petaluma), additional operational storage with associated pump station and 4,800 LF of piping (Napa SD), and two aquifer storage and recovery (ASR) projects near Sonoma including a combined 2,000 LF of pipeline (SCWA).

The pipeline alignment that would serve agricultural customers along Highway 116/Lakeville Highway is within a moderate to high fire hazard severity zone. As discussed in Section 3.12.2 *Regulatory Framework*, state regulations require spark arrestors on off-road equipment, which would reduce the risk of starting a wildland fire to less than significant. In addition, compliance with the local plans to reduce fire hazards would be required. Finally, impacts resulting from wildfires would be reduced to less-than-significant with the implementation of **Mitigation Measure 3.12-6, Fire Safety Plan**, that would require that construction contractors prepare and implement traffic control plan in accordance with local regulations for conducting work within the areas designated above as susceptible to wildland fires. With implementation of **Mitigation Measure 3.12-6**, the potential for wildland fires during construction of these Proposed Action components would be reduced to **less than significant with mitigation**. The mitigation measure is described further below.

TABLE 3.12-5: PROPOSED ACTION: WILDFIRES

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTIONS		
Treatment Upgrades		
Novato SD RWF	Novato SD	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD/CMSA	
Pipeline Projects		
Marin County Lower Novato Creek	Marin Co.	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	The proposed action components are located in areas of moderate to high wildland fire hazard severity zones. Impacts under this criterion would be reduced to less-than-significant levels with the implementation of **Mitigation Measure 3.12-6 Fire Safety Plan** that would require that construction contractors prepare and implement traffic control plan in accordance with local regulations for conducting work within the areas designated above as susceptible to wildland fires. With implementation of **Mitigation Measure 3.12-6**, the potential for wildland fires during construction of these Proposed Action components would be reduced to **less than significant with mitigation**.
MMWD San Quentin Pipeline	MMWD/CMSA	
Petaluma Urban Recycled Water	Petaluma	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
Napa SD Soscol Covered Storage	Napa SD	
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	This program element is located in area of moderate to high wildland fire hazard severity zones. Impacts under this criterion would be reduced to less-than-significant levels with the implementation of **Mitigation Measure 3.12-6 Fire Safety Plan** that would require that construction contractors prepare and implement traffic control plan in accordance with local regulations for conducting work within the areas designated above as susceptible to wildland fires. With implementation of **Mitigation Measure 3.12-6**, the potential for wildland fires during construction of these Proposed Action components would be reduced to **less than significant with mitigation**.
Napa SD Napa State Hospital Pipeline	Napa SD	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Proposed action components would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be no impact.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	
SCWA Potable Water ASR - Valley of the Moon	SCWA	
SCWA Potable Water ASR - Sonoma	SCWA	

Storage Alternative

Table 3.12-6 identified potential wildfire impacts. These Storage Alternative elements would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be **no impact**.

TABLE 3.12-6: STORAGE ALTERNATIVE: WILDFIRES

Proposed Action	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	These Storage Alternative elements would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be **no impact**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	These Storage Alternative elements would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be **no impact.**
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	These Storage Alternative elements would be located outside of areas designated as high fire hazard severity areas. Therefore, there would be **no impact.**
Napa SD Jameson Ranch	Napa SD	
SVCSD Seasonal Storage - Mulas	SVCSD	
Petaluma – Ellis Creek WRF Southeast (Secondary)	Petaluma	The Proposed Action components are located in areas of moderate to high wildland fire hazard severity zones. Impacts under this criterion would be reduced to less-than-significant levels with the implementation of **Mitigation Measure 3.12-6 Fire Safety Plan** that would require that construction contractors prepare and implement traffic control plan in accordance with local regulations for conducting work within the areas designated above as susceptible to wildland fires. With implementation of **Mitigation Measure 3.12-6**, the potential for wildland fires during construction of these Proposed Action components would be reduced to **less than significant with mitigation**. The mitigation measure is described further below.

Mitigation Measures

Mitigation Measure 3.12-6: Fire Safety Plan.

Prior to construction, the construction contractor for each project component that would be within or adjacent to an area designated as susceptible to wildland fires shall prepare and implement a fire safety plan to reduce the potential for starting wildland fires during construction activities. The fire safety plan shall provide, but not be limited to, the following elements:

Mitigation Measure 3.12.6: In consultation with local fire agencies, a Fire Safety Plan will be developed for each of the service areas designated as susceptible to wildland fires. The Fire Safety Plans will describe various potential scenarios and action plans in the event of a fire. During project construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a spark arrestor shall be equipped with a spark arrestor in good working order. All vehicles and crews working at the project sites shall have access to functional fire extinguishers at all times. In addition, construction crews will be required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.

Impact Significance after Mitigation: Less than Significant.

3.12.3.3 Impact Summary by Service Area

Appendix 3.12B provides a summary of potential Project impacts per Member Agency related to hazards and hazardous materials.

3.13 Public Services and Utilities

This section describes public services (i.e., police and fire protection, emergency medical services, schools and parks, and libraries) and utilities (i.e., water, sewer, solid waste, hazardous waste, and electricity) in the project area in Section 3.13.1, *Affected Environment*. Section 3.13.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources is presented in Appendix 3.13A. No comments or other input were received during the scoping period for this EIR/EIS regarding public services and utilities. The NBWRP Phase 2 environmental impact analysis relative to recreational facilities (i.e., parks, trails, bicycling, etc.) is presented in Section 3.15, *Recreation*.

3.13.1 Affected Environment

Public services and utility services within the Member Agency service areas include provision of police, fire and emergency medical services, schools and libraries, as well as water, sewer, natural gas and electrical utilities. These services are provided by municipalities or private utilities. A discussion of public service and utility providers for each of the Member Agencies is provided in **Appendix 3.13A**.

3.13.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Public Service and Utility issues and used to determine the significant criteria present in Section 3.13.3.1 is found in **Appendix 3.13A**.

3.13.3 Direct and Indirect Effects

3.13.3.1 Significance Criteria under CEQA

Based on the Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant impact on public services and utilities if it would interfere with acceptable service ratios, response times, or other performance objectives for any of the following public services:

1. emergency services
2. emergency response plans or emergency evacuation plans
3. fire protection
4. police protection
5. schools
6. parks; or
7. other public facilities.

Refer to Chapter 5, *Growth Inducement*, regarding the potential for NBWRP Phase 2 or an alternative to induce growth and contribute to indirect, secondary impacts, including increased demand for public services and utilities. Refer to Section 3.17, *Energy Conservation* for a discussion of impacts related to energy including use of electricity related to implementation of NBWRP Phase 2.

3.13.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 mile of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative would include additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined construction footprint of approximately 79 acres, and would result in an additional 1,934 AFY of recycled water compared to the proposed Action, providing a total of 6,819 AFY of recycled water supply.

Impact 3.13.1: Temporary effect on response times for emergency service providers. Project construction activities could temporarily affect response times for emergency service providers. (Less than Significant with Mitigation)

Construction of the recycled water pipelines in the NBWRP Phase 2 area would occur along roadways and is likely to affect response times for the provision of emergency services to area residents. Construction would include some roadwork necessitating lane closures and could cause delays and other traffic complications.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, construction of the four projects summarized above would include recycled water pipeline installation. Pipeline installation would occur predominantly along existing roadways and could affect response times for local police and fire departments, as well as ambulance or other emergency services. Associated construction activities, including daily arrival and departure of construction workers and trucks hauling equipment and materials, would affect response times for emergency service providers. This would be considered a significant impact. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Proposed Action

Construction would include recycled water pipeline installation, booster and distribution pump stations, storage facility construction, and wastewater treatment facility upgrades. Pipeline installation would occur predominantly along existing roadways and could disrupt normal access to homes and businesses along these routes and affect response times for local police and fire departments as well as ambulance or other emergency services. This could be a significant impact. Construction of pump stations and storage reservoirs would occur at disturbed sites or within existing WWTP sites. Associated construction activities, including daily arrival and departure of construction workers and trucks hauling equipment and materials, could cause temporary traffic congestion along access roads to the construction sites. This could significantly affect response times for emergency service providers. Additionally, staging areas would be used that could temporarily contribute to congestion and/or response time delays. See **Section 3.8, Transportation and Traffic**, for additional information on construction-related traffic (i.e., trips, construction duration). Treatment plant upgrades would occur within existing water reclamation facilities and would not involve substantial construction activities (ingress/ egress) that would affect response times for emergency providers; therefore, they are not discussed further. A discussion of impacts by service area for NBWRA Phase 2 is provided below.

Novato SD

Treatment capacity upgrades at the Novato SD RWF would occur entirely within the existing WWTP facility, generating about 18 one-way worker trips and 2 one-way heavy truck trucks per day on area roadways over a four-month period. The added trips are not expected to impede traffic flow or emergency service response capabilities. Impacts related to temporary disruption of emergency services would be **less than significant**.

The Lower Novato Creek Distribution Project 1 would involve construction of conveyance facilities including 5,443 LF of pipelines to deliver recycled water to newly constructed levees facilitating WWTP protection. It is assumed that access to the construction area would be provided through the WWTP, though emergency response teams could presumably access the site via Highway 37 to the south. Emergency response calls would occur only on an as-needed basis, if at all. Moreover, no in-road construction would occur in the area to impede emergency response. Given the lack of in-road construction and as-needed occurrences, impacts to emergency service response times would be **less than significant**.

The Turnout to Wetlands Project construction would include installation of a hydraulic structure and short length of pipe to divert flow of recycled water to occur in an isolated area near the Hamilton Bel Marin Keys wetlands. Effects to area roadways would be limited to materials deliveries and worker trips, which would likely be through the former Hamilton Air Force Base development. Emergency response calls would occur only on an as-needed basis, if at all. Moreover, no in-road construction would occur in the area to impede emergency response. Given the lack of in-road construction and as-needed occurrences, impacts to emergency service response times would be **less than significant**.

SVCSD

SCVSD Napa Road Pipeline. The Napa Road Recycled Water Pipeline would be constructed within the roadway to connect the 11,500 LF line to a previously constructed pipeline expanding recycled water service in Sonoma. Over the estimated six-week construction period, installation of this pipeline in the roadway could require lane closures at times which would potentially affect traffic flow and emergency response times. Impacts related to emergency response times would be significant. This would be considered a significant impact. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

MMWD

The proposed recycled water pipeline connecting CMSA to the San Quentin State Prison would involve water treatment filtration upgrades at CMSA and trench construction to accommodate a recycled water pipeline installed mainly within Andersen Drive and Sir Francis Drake Boulevard for a length of approximately 1.1 mile. Over the estimated two-month construction period, installation of this pipeline could require lane closures at times which would potentially affect traffic flow and emergency response times. Impacts related to emergency response times would be significant. This would be considered a significant impact. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Napa SD

Soscol WRF Increased Filter Capacity. The Soscol WRF Increased Filtration Capacity Project would consist of installing filters and associated mechanical components in the previously installed empty filter basin and would occur within the bounds of the existing facility. This project would increase tertiary treatment capacity, with limited impacts to public services and utilities. Similar to other water treatment plant upgrades described above, this Project could include planned service interruptions while the upgrades are constructed. Such upgrades would be under the control of Napa SD and would be **less than significant**.

Petaluma

Ellis Creek WRF Increased Capacity. The proposed Ellis Creek WRF Increased Capacity upgrades would occur within the existing water recycling facility, generating about 18 one-way worker trips and 2 one-way heavy truck trucks per day on area roadways over an eight-month period. The added trips are not expected to create an impediment to traffic flow or emergency service response capabilities. Minimal interruptions to of emergency services is anticipated; therefore, impacts would be **less than significant**.

Urban Recycled Water Expansion. The Urban Recycled Water Expansion would include construction of 8 miles of pipeline which would be constructed in public roadways requiring lane closures in an urban and residential area. Pipeline construction would impede traffic flow leading to delays in emergency response times. Impacts related to emergency response times would be significant. This would be considered a significant impact. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Agricultural Recycled Water Expansion. The first two phases of the Agricultural Recycled Water Expansion would collectively involve construction of approximately 3.3 miles of pipeline along a heavily-travelled roadway (Highway 116/Lakeville Highway) often used to avoid congested conditions on Highway 101. Impacts would be significant as construction activities and lane closures would impede to traffic flow, delaying emergency response times. Impacts related to emergency response times would be significant, but reduced to less-than-significant levels with the incorporation of **Mitigation Measure 3.13-1**. This impact would be **less than significant with mitigation.**

City of American Canyon

WRF Treatment Plant Upgrades. Treatment plant upgrades proposed at the City of American Canyon's Water Reclamation Facility (American Canyon WRF) would occur within developed areas of the existing facility. Construction ingress and egress is not expected to be substantial enough to impact regional traffic such that measurable delays for emergency service providers would occur. Impacts under this criterion would be **less than significant**.

Recycled Water Distribution 1, Recycled Water Distribution 2 Projects. The recycled water distribution projects in American Canyon would occur in public roadways including along SR 29, a heavily-travelled route. This construction would require temporary lane closures in order to accomplish trenching activities required for pipeline installation. Impacts including traffic causing delays related to lane closures and traffic management during the construction phase may occur and could be significant. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Program Elements

Novato SD

Seasonal Storage Near Highway 37. Construction of a new recycled water storage pond with 150 AF of seasonal capacity is proposed under NBWRA Phase 2. This project would include construction/installation of 4,000 LF of levee, one pump station, two weir boxes and 250 LF of pipeline to convey water to the existing Deer Island Water Recycling Plant (WRP). Given the location of the proposed action, impacts affecting emergency response times are possible and could be significant. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Marin County Lower Novato Creek Project – Restoration. The Lower Novato Creek Restoration would involve program elements 2-6 proposed to occur downstream of the SMART/ Northwest Pacific Railroad Bridge to Highway 37 to implement a number of related wetland enhancements including reconfiguration of levees and tidal marsh restoration for flood protection.

Impacts would be similar to those described under the lower Novato Creek (project level) projects. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Petaluma

Agricultural Recycled Water Expansion Phase 3. The third phase of the agricultural recycled water expansion could generate impacts similar to those previously described causing delays to emergency response times and requiring coordination and appropriate traffic planning. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Napa SD

Napa State Hospital Storage Tank. Installation of a new 5 MG recycled water storage tank and 4,800 LF of pipeline to connect the water tank located near Napa State Hospital to the existing recycled water main would include trenching activities and would require the use of large equipment including some rock bracing at 20 foot intervals to secure the line in a (1,800 LF) hillside segment. Given the scope and location of the proposed action, impacts causing delays to emergency service response times could occur. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

SCWA

Valley of the Moon and Sonoma ASR. The Valley of the Moon aquifer storage and recovery (ASR) project would include construction of a new ASR well, two monitoring wells, a pump station and 500 LF of pipeline to convey potable water to the Valley of the Moon Water District. The Sonoma ASR facilities would include new ASR well, two monitoring wells, a pump station and 1,700 LF of pipeline to convey potable water from existing storage tanks to the ASR well. These facilities would not require substantial work in public roads; so impacts related to delays in emergency response times are would be **less than significant**. The Sonoma ASR facilities would include a new ASR well, two monitoring wells, a pump station, and 500 LF of pipeline to convey potable water.

American Canyon

RW5, RW6. Construction of the proposed recycled water distribution systems along Jim Oswald Way-Mezzetta Court, and along Hannah Drive would include roadwork in an industrial area to serve industrial water users. This construction would occur in public roads and may require lane closures or other traffic management such that delays in emergency response times could occur. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Storage Alternative

The Seasonal Storage projects would be constructed within one year or in sequential construction seasons, each lasting less than a year. As required by Regional Board storm water requirements, construction would cease over the rainy season (i.e., November through April), during which time any disturbed ground surface would be temporarily stabilized. Upon completion of construction, roadways and other surfaces would be restored to their pre-project condition.

Novato SD

Increased Tertiary Capacity and Storage. The proposed Novato SD capacity increases to tertiary level recycled water treatment would occur adjacent to other Proposed Program improvements at the existing facility. This proposed Alternative Storage Project would not involve extensive pipelines in roadways that could cause temporary delays to emergency response times, therefore impacts under this criterion would be **less than significant**.

Seasonal Storage Near SR 37 (150 AF). The proposed 150 AF seasonal storage pond would be constructed adjacent to the Deer Island WRF near SR 37. Levees would be constructed which would include a 12-foot access road on top. The storage pond would be filled through a hydraulic linkage which would connect to the existing secondary storage pond at the Deer Island WRF. The project would also include placement of 9,500 LF of recycled water pipeline near the existing facility. Impacts with respect to delays in response times for emergency services could occur given the location of the proposed Alternative. **Mitigation Measure 3.13-1** is proposed to address these potential impacts to response capabilities. Therefore, these impacts would be **less than significant with mitigation.**

SVCSD

Seasonal Storage Mulas Site. Development of this tertiary storage alternative would entail construction of 1,878 LF of levee encircling approximately five acres of proposed storage area, along with a small pump station, which would support on-site irrigation. Impacts to public services and utilities would be similar to those described for other storage options and would not involve substantial work in roadways. Therefore, impacts under this criterion would be **less than significant**.

Petaluma

Seasonal Storage. Construction two new seasonal storage ponds at a site southeast of and hydraulically connected to the existing Ellis Creek WRF ponds to enable the City of Petaluma to store an additional 300 AF of secondary treated water. This storage option, including 9,200 LF of levee, 500 LF of pipeline, weirs and sluice gates to control water levels would occur adjacent to existing facilities at Ellis Creek WRF. Impacts to public services and utilities would be similar to those described for other storage options and would not involve substantial work in roadways. Therefore, impacts under this criterion would be **less than significant**.

Napa SD

Storage Alternative. The two seasonal storage ponds proposed for the Jameson Ranch site would include 600 AF of storage along with 5,000 LF of pipelines, hydraulic control structures, a pump station and other infrastructure on approximately 45 acres of undeveloped land in Napa and would provide recycled water for area golf courses. Given the proposed location of this alternative, near Highway 29 and the Highway 12 juncture, impacts to public services and utilities, such as delays to emergency response times could occur during construction. **Mitigation Measure 3.13-1** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

MST northern and eastern extension of recycled water distribution would include construction of 4.9 miles of pipelines primarily within existing roadways in a region of Napa identified as having limited groundwater resources. This would involve trenching and other roadwork which could impact emergency response times and or require lane closures similar to those previously described. Such impacts would be reduced to less than significant levels with the incorporation of **Mitigation Measures 3.13-1 and 3.13-3**. **(Less than Significant with Mitigation)**

Mitigation Measures

> **Mitigation Measure 3.13-1:** The Member Agencies or Participating Municipalities will coordinate with local emergency service providers in its service area to inform them of the proposed construction activities and schedule, and provide temporary alternate access routes around construction areas as necessary.

Impact Significance after Mitigation: Less than Significant.

Impact 3.13.2: Short-term Police and Fire Assistance. Project construction activities could require short-term police and fire protection services to assist in traffic management or in the event of an accident. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, construction of the four projects summarized above would include recycled water pipeline installation. Pipeline installation would occur predominantly along existing roadways and could require short-term assistance from local police and fire departments. Given the unanticipated nature of this, a significant impact would be created when department personnel are responding to multiple incidents. This would be considered a significant impact. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Proposed Action

Construction of the proposed action recycled water pipelines, booster and distribution pump stations could lead to a possible temporary increase in demand for police and fire emergency services if an accident were to occur on site. Such construction would involve the use of heavy equipment in public roadways, where trenching could increase traffic congestion and temporarily alter road conditions.

Distribution and booster pump station as well as reservoir storage construction activity also has the potential to contribute to an increased localized demand for short-term public safety services, though to a lesser degree given that construction of these projects is not generally proposed to occur in public roadways. However, if an accident were to occur during construction or if traffic management is otherwise required, measures to alleviate temporary demands for police or fire assistance would be addressed through the prescribed mitigation measures.

Novato SD

RWF Treatment Capacity Expansion. Treatment capacity upgrades at the Novato SD RWF would occur entirely within the existing WWTP facility, the construction of which would involve minimal ingress and egress to the facility. There would be **no impact** under this criterion.

Lower Novato Creek Project 1 – Distribution. The Lower Novato Creek Distribution Project 1 would involve construction of conveyance facilities including 5,443 LF of pipelines to deliver recycled water to newly constructed levees facilitating treatment plant protection. The Project would occur in an alignment adjacent to an existing recycled water pipeline. Unlike many of the other NBWRP Phase 2 proposed actions, this project would not be built in existing roadways, however if an emergency were to occur response teams would likely travel along Highway 37, a heavily-travelled corridor therefore accidents could occur and impacts could be significant. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Turnout to Wetlands. The construction of a hydraulic structure to divert flow of recycled water would occur in an area near the Hamilton Bel Marin Keys wetlands. This project would not interfere with provision of public services, as the entire project would not involve public roadways or interfere with delivery of emergency services or other provision of public utilities. There would be **no impact** under this criterion for the Turnout to Wetlands project.

SVCSD

SCVSD Napa Road Pipeline. The Napa Road Recycled Water Pipeline Project would be constructed within the roadway to connect the 11,500 LF line to a previously constructed pipeline expanding recycled water service in Sonoma. This would involve potential lane closures and traffic control coordination with law enforcement personnel in order to decrease the possibility of accidents associated with this construction effort. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

MMWD

San Quentin Prison Recycled Water Distribution System. The proposed recycled water pipeline connecting CMSA to the San Quentin State Prison would involve water treatment filtration upgrades at CMSA and trench construction to accommodate approximately 5,800 LF of 6-inch diameter pipeline installed mainly within Sir Francis Drake Boulevard, for a length of approximately 1.1 mile. Placement of this pipeline could require lane closures at times and affect traffic, as outlined in Section 3.8. With the inclusion of these mitigation measures, efforts would be made to inform emergency service provider in the project areas of the planned project construction and provide alternate access routes, as required. Additionally, **Mitigation Measure 3.13-2** would ensure that appropriate coordination with public service agencies, as required, in the event of accidents which could occur along the construction routes or within the facilities, necessitating law enforcement or other emergency support services. Therefore, this impact would be **less than significant with mitigation**.

Napa SD

Soscol WRF Increased Filter Capacity. The NBWRP Phase 2 facility upgrades would occur within the bounds of the existing water treatment facility. Construction activity is expected to generate minimal ingress and egress, therefore impacts under this criterion would be **less than significant**.

Soscol WRF Covered Storage. Construction of additional water storage would occur in undeveloped areas owned by Napa SD within or adjacent to the existing facility. Similar to the Increased Filter Capacity Project, minimal ingress and egress is expected; therefore, impacts under this criterion would be **less than significant**.

Petaluma Ellis Creek WRF

Ellis Creek WRF Increased Capacity. Facility upgrades to increase tertiary filtration and disinfection capacity are proposed to occur within the existing Ellis Creek WRF upon previously placed system channels. Construction traffic to and from the facility would not be substantial for the implementation of this Project, therefore impacts under this criterion would be **less than significant**.

Urban Recycled Water Expansion. The urban recycled water expansion projects would include construction of 8 miles of pipeline which would be constructed in public roadways in a populated urban area and would require coordinated lane closures. This could be a significant impact. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Agricultural Recycled Water Expansion. The first two phases of the agricultural recycled water expansion would collectively involve construction of approximately 3.33 miles of pipeline along a heavily-travelled roadway (Lakeville Highway). Construction would involve large equipment for trenching and the use of staging areas requiring some lane closures and other coordination with public safety personnel. Impacts could be significant as lane closures could lead to traffic congestion and accidents could occur in such a scenario, given the location of the proposed action. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

City of American Canyon

WRF Treatment Plant Upgrades. Similar to the treatment capacity upgrades described for other agencies, the water quality upgrades would occur within previously disturbed areas of the facility. Limited ingress and egress related to construction is anticipated, therefore impacts under this criterion would be **less than significant**.

Recycled Water Distribution Phase 1, Phase 2 Projects. The recycled water distribution projects in American Canyon would occur in public roadways including along SR 29, a heavily-travelled route. This construction would require temporary lane closures in order to accomplish trenching activities required for pipeline installation. Impacts requiring coordination and support of law enforcement for traffic control are possible during construction and could be significant. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Program Elements

Novato SD

Seasonal Storage Near Highway 37. Construction of a new recycled water storage pond with 150 AF of seasonal capacity is proposed under NBWRA Phase 2. The Program Elements would include construction/installation of 4,000 LF of levee, one pump station, two weir boxes and 250 LF of pipeline to convey water to the existing Deer Island Water Recycling Plant (WRP). Given the scope and the location of the proposed action, impacts could occur. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Marin County Lower Novato Creek Project – Restoration. The Lower Novato Creek Restoration would involve program elements 2-6 proposed to occur downstream of the SMART/Northwest Pacific Railroad Bridge to Highway 37 to implement a number of related wetland enhancements including reconfiguration of levees and tidal marsh restoration for flood protection. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Petaluma

Agricultural Recycled Water Expansion Phase 3. The extension of an additional 11,300 LF of pipelines in eastern Petaluma for agricultural recycled water distribution would occur along Lakeville Road. Similar to impacts listed under Phase 2 of the Agricultural Recycled Water Distribution Expansion, construction along this route would likely involve lane closures and temporary impacts related to this construction. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Napa SD

Napa State Hospital Storage Tank. Installation of a new 5 MG recycled water storage tank and 4,800 LF of pipeline to connect the tank located near Napa State Hospital to the existing recycled water main would include trenching activities and would require the use of large equipment including some rock bracing at 20-foot intervals to secure the line in a (1,800 LF hillside) segment. Impacts requiring traffic control could occur. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

SCWA

The Valley of the Moon ASR would include construction of one new groundwater well, two new monitoring wells, 500 LF of 6-inch diameter pipeline and a pump station program in order to utilize potable water to during winter months to meet demand in summer months (aquifer recharge). Proposed facilities would have a relatively small project footprint but these ASR components would be constructed in an area that may require traffic control, therefore disturbances and lane closures are possible. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Sonoma ASR would include construction of one new groundwater well, converting an existing groundwater well to a monitoring well, two new monitoring wells, 1,700 LF of new pipelines, and a pump station- proposed for the purpose of balancing seasonal water demand and aquifer recharge. Similar to the Valley of the Moon ASR, the Sonoma ASR components would be constructed in an area that may require traffic control, therefore disturbances and lane closures are possible. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

American Canyon

RW5, RW6. Construction of the proposed recycled water distribution systems along Jim Oswald Way-Mezzetta Court, and along Hannah Drive would include roadwork in an industrial area to serve industrial water users. This construction would occur in public roads and may require lane closures or other traffic management. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Storage Alternative

Novato SD

Increased Tertiary Capacity and Storage. The proposed Novato SD capacity increases to tertiary level recycled water treatment would occur adjacent to other Proposed Program improvements at the existing facility. This proposed Alternative

Storage Project would not involve extensive pipelines in roadways; therefore, impacts under this criterion would be **less than significant**.

Seasonal Storage Near SR 37 (150 AF). The proposed 150 AF seasonal storage pond would be constructed adjacent to the Deer Island WRF near SR 37. Levees would be constructed which would include a 12-foot access road on top. The storage pond would be filled through a hydraulic linkage which would connect to the existing secondary storage pond at the Deer Island WRF. The project would also include placement of 9,500 LF of recycled water pipeline near the existing facility. Impacts could occur given the location of the proposed Alternative that may require short term police or fire services. **Mitigation Measure 3.13.2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

SVCSD

Seasonal Storage Mulas Site. Development of this tertiary storage alternative would entail construction of 1,878 LF of levee encircling approximately five acres of proposed storage area, along with a small pump station, which would support on-site irrigation. Impacts to public services and utilities would be similar to those described for other storage options and would not involve substantial work in roadways. Therefore, impacts under this criterion would be **less than significant**.

Petaluma

Seasonal Storage. Construction two new seasonal storage ponds at a site southeast of and hydraulically connected to the existing Ellis Creek WRF ponds to enable the City of Petaluma to store an additional 300 AF of secondary treated water. This storage option, including 9,200 LF of levee, 500 LF of pipeline, weirs and sluice gates to control water levels would occur adjacent to existing facilities at Ellis Creek WRF. Impacts to public services and utilities would be similar to those described for other storage options and would not involve substantial work in roadways, such that a need for traffic control would occur. Therefore, impacts under this criterion would be **less than significant**.

Napa SD

Storage Alternative. The two seasonal storage ponds proposed for the Jameson Ranch site would include 600 AF of storage along with 5,000 LF of pipelines, hydraulic control structures, a pump station and other infrastructure on approximately 45 acres of undeveloped land in Napa and would provide recycled water for area golf courses. Given the proposed location of this alternative, near Highway 29 and the Highway 12 juncture, impacts to public services and utilities could occur during construction. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

MST northern and eastern extension of recycled water distribution would include construction of 4.9 miles of pipelines primarily within existing roadways in a region of Napa identified as having limited groundwater resources. This would involve trenching and other roadwork which could require lane closures similar to those previously described. **Mitigation Measure 3.13-2** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation** incorporated.

Mitigation Measures

> **Mitigation Measure 3.13-2:** The Member Agency (i.e., project owner) or it construction contractor shall provide 72-hour notice to the local emergency service providers prior to construction of individual pipeline segments. The Member Agency or its construction contractor shall provide, upon request, a copy of the Traffic Control/Traffic Management Plan to the emergency service agencies for review prior to construction. Discussion on the Traffic Control/Traffic Management Plan is provided in Section 3.8, Transportation.

Impact Significance after Mitigation: Less than significant.

Impact 3.13.3: Temporary Disruption to Utility Services. Project construction could result in temporarily, planned or accidental disruption to utility services. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, construction of the four projects summarized above would include recycled water pipeline installation. Pipeline installation would occur predominantly along existing roadways and would have potential for significant impacts to public services and utilities. Construction activities could result in damage to or interference with existing water, sewer, storm drain, natural gas, oil, electric, and/or communication lines and, in some cases, could require that existing lines be permanently relocated, potentially causing interruption in service. Streets and trails function as utility corridors within the project area, which creates a greater potential for interference with other existing utilities. **Mitigation Measure 3.13-3** is proposed to require coordination

between the Member Agency (i.e., project owner) and its construction contractors and utility service providers to avoid these conflicts. With implementation of this measure, such impacts would be **less than significant with mitigation**.

Proposed Action

Construction activities associated with the Proposed Action could result in damage to or interference with existing water, sewer, storm drain, natural gas, oil, electric, and/or communication lines and, in some cases, could require that existing lines be permanently relocated, potentially causing interruption in service. Numerous utility lines of varying sizes are located along and across proposed pipeline alignments; within the SVCSD, MMWD, Novato SD, Napa SD WWTPs, Petaluma Ellis Creek WRF, and the City of American Canyon WRF; and at the various pumping plants and reservoir sites. Streets and trails function as utility corridors within the project area, which creates a greater potential for interference with other existing utilities.

In most cases, service disruptions would be temporary and would not exceed one day. All utility lines and cables that would be disrupted during pipe installation could be identified during preliminary design. As a condition of approval for either a utility excavation permit or an encroachment permit, the Member Agencies/ Participating Municipalities would prepare a detailed engineering and construction plan that would thoroughly describe construction techniques and protective measures for minimizing impacts to utilities. Temporary and accidental impacts to smaller utility lines would be considered adverse, but not significant, because the affected area and duration of the impacts would be short-term. Disruptions to major utility lines would be considered significant, but mitigable.

Treatment upgrades at any of the WWTP's would not interrupt water supply service to the corresponding service areas because water service during any planned outages could be provided on a temporary basis from existing distribution storage. With the exception of planned outages to connect facilities to power, the WWTPs would remain online during the construction of proposed improvements. The expected duration of the planned outages would be 12 hours during the summer and 24 hours during the winter. The level of service during a planned outage would remain unchanged. A brief discussion per service area is provided, as follows.

Novato SD

RWF Treatment Capacity Expansion. Treatment capacity upgrades at the Novato SD RWF would occur entirely within the existing WWTP facility, the construction of which could temporarily disrupt provision of water treatment at the site. Impacts related to temporary disruption of utility services would be reduced through the implementation of **Mitigation Measure 3.13-3**. Therefore, these impacts would be reduced to **less than significant with mitigation incorporated**.

Turnout to Transitional Wetlands. The construction of a hydraulic structure to divert flow of recycled water would occur in an area near the Hamilton Bel Marin Keys wetlands. This project would not interfere with provision of public services, as the project would not involve public roadways or otherwise substantially interfere with delivery of public utilities. Planned interruptions that may occur during installation of the hydraulic structures associated with the Turnout to Wetlands project would be **less than significant**.

SVCSD

SCVSD Napa Road Pipeline. The Napa Road Recycled Water Pipeline Project would be constructed within a public roadway shared by other utilities in an underground corridor. Planned or accidental interruptions to the provision of public services are possible during project construction, given the trenching proposed to occur and impacts could be significant. However, such impacts would be reduced to less-than-significant levels with the inclusion of **Mitigation Measure 3.13-3**. Therefore, these impacts would be reduced to **less than significant with mitigation incorporated**.

MMWD

San Quentin Prison Recycled Water Distribution System. Tertiary filtration treatment upgrades proposed to occur at the CMSA facility which would provide recycled water to San Quentin Prison would require a coordinated plan in order to prevent service disruptions. Additionally, construction of the proposed distribution system would involve trenching in Sir Francis Drake Boulevard, an activity which if not approached with consideration could accidently impact other utilities sharing the corridor. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Napa SD

Soscol WRF Increased Filter Capacity. The NBWRP Phase 2 facility upgrades would occur within the bounds of the existing water treatment facility. Planned water treatment process interruptions, associated with filter and other infrastructure installation are likely to occur at the facility during construction. However, given that the treatment train would be under the control of the sanitation district, impacts under this criterion would be **less than significant**.

Petaluma

Ellis Creek WRF Increased Capacity. Facility upgrades to increase tertiary filtration and disinfection capacity are proposed to occur within the existing Ellis Creek WRF upon previously placed system channels. Construction may involve planned temporary

interruptions of recycled water treatment processes in order to the implement this project, impacts if any would be under the control of Ellis Creek WRF and as such, would be **less than significant**.

Urban Recycled Water Expansion. The urban recycled water expansion projects would include construction of 8 miles of pipeline which would be constructed in public roadways in a populated urban area and would require coordinated approach to decrease the probability of impacting other utilities that may share the subsurface utility corridor. In the absence of constraints analysis and a carefully planned approach, this could be a significant impact, however with the implementation of **Mitigation Measure 3.13-3**, impacts would be reduced to less-than-significant levels.

Agricultural Recycled Water Expansion. The first two phases of the agricultural recycled water expansion would collectively involve construction of approximately 3.33 miles of pipeline along a heavily-travelled roadway (Lakeville Highway). Construction would involve large equipment for trenching purposes and the use of staging areas requiring some lane closures and other activities necessitating coordination with public safety personnel. Impacts could be significant, given the location of the proposed action, in some cases within a shared subsurface utility corridor, accidental service disruptions could occur and such impacts could be significant. However, through implementation of **Mitigation Measure 3.13-3**, which would provide for the appropriate pre-project communication and planning including development of alternate routes during construction. Therefore, these impacts would be reduced to **less than significant with mitigation incorporated**.

City of American Canyon

WRF Treatment Plant Upgrades. Similar to the treatment capacity upgrades described for other agencies, the water quality upgrades would occur within previously disturbed areas of the facility. Although construction associated with the plant upgrades may involve temporary service disruptions during installation, the process would be under the control of the service provider and would not include impacts in public roadways; therefore, impacts under this criterion would be **less than significant**.

Recycled Water Distribution 1, Recycled Water Distribution 2 Projects. The recycled water distribution projects in American Canyon would occur in public roadways including along SR 29, a heavily- travelled route. This construction would require temporary lane closures in order to accomplish trenching activities required for pipeline installation. Given that other utilities share the subsurface utility corridor, in the absence of utility identification and other measures, project construction could lead to accidental interruptions, and possible impacts could be significant. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Program Elements

Novato SD

Seasonal Storage Near Highway 37. The construction of this project would involve temporary disturbances such as noise and dust associated with the use of heavy equipment required for excavation of this pond, installation of the pipeline, pump station and appurtenances. Construction would likely include ingress and egress along Highway 37 and as such impacts involving utility disruptions could occur. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Restoration projects 2-6 proposed to occur downstream of the SMART/ Northwest Pacific Railroad Bridge to Highway 37 would involve a number of related wetland restoration activities including the enhancement of the Novato Creek corridor, reconfiguration of levees, along with restoration of tidal marshes for flood protection. Construction would likely include ingress and egress along Highway 37 and as such impacts involving utility disruptions could occur. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Petaluma

Agricultural Recycled Water Expansion Phase 3. The extension of an additional 11,300 LF of pipelines in eastern Petaluma for agricultural recycled water distribution would occur along Lakeville Road, necessitating some lane closures to facilitate the construction. Impacts involving disruption of utilities could occur as trenching activities would take place in a shared utility corridor. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Napa SD

Napa State Hospital Storage Tank. Installation of a new 5 MG recycled water storage tank and 4,800 LF of pipeline to connect the tank located near Napa State Hospital to the existing recycled water main would include trenching activities and would require the use of large equipment including some rock bracing at 20 foot intervals to secure the line in a (1,800 LF) hillside segment. Given the length of the proposed pipeline and the location of the proposed action, impacts involving disruption of other utilities could occur. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

SCWA

Valley of the Moon and Sonoma ASR. Other impacts could occur related to possible conflicts with other subsurface utilities in roadways during construction of the pipeline. The Valley of the Moon ASR would include construction of one new groundwater well, two new monitoring wells, 500 LF of 6-inch diameter pipeline and a pump station. The Sonoma ASR would include construction of one new groundwater well, converting an existing groundwater well to a monitoring well, two new monitoring wells, 1,700 LF of new pipelines, and a pump station- proposed for the purpose of balancing seasonal water demand and aquifer recharge. The projects would not require a large construction footprint, however they would require the use of heavy equipment and trenching in public roadways; therefore, impacts involving disruption to utilities could occur. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

American Canyon

RW5, RW6. Construction of the proposed recycled water distribution systems along Jim Oswald Way-Mezzetta Court, and along Hannah Drive would include roadwork in an industrial area to serve industrial water users. Such construction would involve limited road closures and could impact utilities in these roadways. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Storage Alternative

The Seasonal Storage projects would be constructed within one year or in sequential construction seasons, each lasting less than a year. As required by Regional Board stormwater requirements, construction would cease over the rainy season (i.e., November through April), during which time any disturbed ground surface would be temporarily stabilized. Upon completion of construction, each of these projects would be restored to pre-construction conditions.

Novato SD

Increased Tertiary Capacity and Storage. The proposed Novato SD capacity increases to tertiary level recycled water treatment would occur adjacent to other Proposed Program improvements at the existing facility. Temporary disruptions to utilities (wastewater treatment) may occur while such treatment train modifications are implemented. However, these interruptions would be planned, and implemented under the sole control of the sanitary district and would be phased to occur such that service disruptions would be minimized, therefore impacts if any would be **less than significant**.

Seasonal Storage Near SR 37 (150 AF). The proposed 150 AF seasonal storage pond would be constructed adjacent to the Deer Island WRF near SR 37. Levees would be constructed which would include a 12-foot access road on top. The storage pond would be filled through a hydraulic linkage which would connect to the existing secondary storage pond at the Deer Island WRF. The project would also include placement of 9,500 LF of recycled water pipeline near the existing facility. Impacts such as temporary interruptions of water treatment at the facility could occur and would be **less than significant** with respect to public services and utilities, given that they would be planned and under the control of Novato SD.

SVCSD

Seasonal Storage Mulas Site. Development of this tertiary storage alternative would entail construction of 1,878 LF of levee encircling approximately five acres of proposed storage area, along with a small pump station, which would support on-site irrigation. Impacts to public services and utilities would be similar to those described for other storage options. Possible impacts such as temporary disruptions to utilities could occur but would be under the control of the SVCSD therefore impacts if any would be **less than significant**.

Petaluma

Seasonal Storage. Construction two new seasonal storage ponds at a site southeast of and hydraulically connected to the existing Ellis Creek WRF ponds to enable the City of Petaluma to store an additional 300 AF of secondary treated water. This storage option, including 9,200 LF of levee, 500 LF of pipeline, weirs and sluice gates to control water levels would occur adjacent to existing facilities at Ellis Creek WRF. Impacts to public services and utilities would be similar to those described for other storage options. Possible impacts such as temporary disruptions to utilities could occur but would be under the control of the Ellis Creek WRF, therefore impacts if any would be **less than significant**.

Napa SD

Storage Alternative. The two seasonal storage ponds proposed for the Jameson Ranch site would include 600 AF of storage along with 5,000 LF of pipelines, hydraulic control structures, a pump station and other infrastructure on approximately 45 acres of undeveloped land in Napa and would provide recycled water for area golf courses. Given the proposed location of this alternative, involving trenching in roadways disruptions to existing utilities could occur. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

MST northern and eastern extension of recycled water distribution would include construction of 4.9 miles of pipelines primarily within existing roadways in a region of Napa identified as having limited groundwater resources. This would involve trenching

and other roadwork which could impact other utilities similar to those previously described. **Mitigation Measure 3.13-3** is proposed to reduce these potential impacts. Therefore, they would be reduced to **less than significant with mitigation incorporated**.

Mitigation Measures

Mitigation Measure 3.13-3: The Member Agencies (i.e., project owner) or its construction contractor shall identify utilities along the proposed pipeline routes and project sites prior to construction and implement the following measures:

a. Utility excavation or encroachment permits shall be obtained as required from the appropriate agencies. These permits include measures to minimize utility disruption. The service provider and its contractors shall comply with permit conditions regarding utility disruption.

b. Utility locations shall be verified through the use of the Underground Service Alert services and/or other equivalent mark and locate field survey.

c. As necessary, detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.

d. In areas where the pipeline would traverse parallel to underground utility lines within five feet, the project applicant shall employ special construction techniques, such as trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the excavated areas.

e. Residents and businesses in the project corridor shall be notified of any planned utility service disruption two to four days in advance, in conformance with county and state standards.

Impact Significance after Mitigation: Less than Significant.

3.13.3.3 Impact Summary by Service Area

Appendix 3.13B provides a summary of potential Project impacts per Member Agency related to public services and utilities.

3.14 Cultural Resources and Tribal Cultural Resources

This section describes cultural resources (including historic-era architectural resources, archaeological resources, tribal cultural resources, and human remains) in the Project area in Section 3.14.1, *Affected Environment*. Section 3.14.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of NBWRP Phase 2 and the alternatives, and summarizes such effects by service area. The cultural resources assessment completed for NBWRP Phase 2 provides the background support for this section (ESA, 2018). The analysis of *Cumulative Impacts* is found in Chapter 4.0. All figures referred to in this section are available in Appendix A. Setting information and Regulatory Framework that governs these resources and considerations is presented in Appendix 3.14A.

During scoping for this EIR/EIS, cultural resource-related and tribal cultural resource-related concerns raised by the public and responsible agencies included Caltrans and the Native American Heritage Commission. Caltrans noted in its comment letter that the project area is highly sensitive for cultural resources and recommended that SCWA conduct a cultural resource technical study that includes a records search utilizing the Northwest Information Center of the California Historical Resources Information System, as well as field survey of the project area by a qualified archaeologist and architectural historian. Assembly Bill (AB) 52 consultation was recommended to assess tribal cultural resources for interested tribal groups. The Native American Heritage Commission submitted a letter providing standard guidance for cultural resources assessments and appropriate consultation under AB 52.

3.14.1 Affected Environment

3.14.1.1 Definitions

Cultural resources is a term used to describe both archaeological sites (prehistoric and historic-era) depicting evidence of past human use of the landscape through material culture and the built environment. Cultural resources also apply to Traditional Cultural Properties (TCP), sites of religious or cultural significance, and Indian Sacred Sites. Those resources that are in or eligible for listing in the National Register of Historic Places (National Register) in that they contribute to the significance of the prehistory or history of the area are referred to as "historic properties."

Historic-era architectural resources include buildings, structures, objects, sites, and historic districts. Military-related architectural resources include earthen batteries, concrete foundations, rock alignments, water-conveyance features, and other artifact concentrations. Historic architectural resources that are listed in or are eligible for listing in the National Register of Historic Places (National Register) are considered "historic properties." Historic architectural resources that are listed in or are eligible for listing in the California Register of Historical Resources (California Register) are considered "historical resources."

Archaeological resources consist of prehistoric or historic-era archaeological resources. Prehistoric archaeological materials might include: obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, milling slabs). Historic-era archaeological materials (not associated with military installations or activities) might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. Similar to historic-era architectural resources, archaeological resources that are listed in or are eligible for listing in the National Register are considered "historic properties." Archaeological resources that are listed in or are eligible for listing in the California Register are considered "historical resources." In addition, archaeological resources can be considered "unique archaeological resources" under CEQA.

A ***tribal cultural resource*** is defined as a site feature, place, cultural landscape, sacred place or object, which is of cultural value to a tribe and that is either on or eligible for the California Register or a local historic register, or the lead agency, at its discretion, chooses to treat the resource as a tribal cultural resource.

A ***TCP*** is a property with significance based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community.

3.14.1.2 Project Area of Potential Effects

The Project area or Area of Potential Effects (APE) for the NBWRP Phase 2 is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[b]). The Project area is the areas of proposed Action components including installation of pipelines and upgrades at existing water treatment facilities. Project area and APE are used interchangeably in this section.

Depending upon the Project components, the APE has been determined as the area of direct impact for NBWRP Phase 2 and includes both the vertical and horizontal extents of potential Project work that could affect cultural resources. As no indirect impacts are expected from the Proposed Action (i.e. visual impacts), the APE is defined only as the area of direct impact. The APE map is provided in the cultural resources assessment completed for NBWRP Phase 2 (ESA, 2018) and included in **Appendix A** as **Figure 3.14-1**.

For the NBWRP Phase 2 pipeline installation, an APE of a 50-foot-wide corridor (25-foot radius from centerline) would be assumed in undeveloped areas to accommodate for areas for staging and spoils. Depending upon the width of the roadway, a narrower, horizontal APE with an average width of 12.5 feet extending through the right-of-way is in locations encumbered by existing improvements and high-volume roadways.

Trenching for installing pipelines would require a maximum width of 3 feet and a vertical depth of up to 6 feet; therefore, the vertical APE would be 6 feet. Jack and bore under-crossings would require a jacking pit measuring approximately 30 feet by 10 feet. The temporary pits typically would be excavated to a maximum depth of 20 feet. Horizontal directional drill pits would be a maximum of 20 feet by 5 feet by 5 feet deep. It has not yet been determined which trenchless methods would occur within the APE, therefore the assumption is a maximum depth of 20 feet below ground surface for disturbance at each major crossing.

The APE at wastewater treatment facilities would vary based on Project component (see **Table 3.14-1**). Each horizontal APE would include the area of direct impact as well as a 25-foot horizontal extension to accommodate work areas.

TABLE 3.14-1: AREA OF POTENTIAL EFFECTS FOR WWTP IMPROVEMENTS

Facility	Length (feet)	Width (feet)	Depth (feet)
Novato SD RWF	700	600	20
MMWD CMSA	200	60	20
Soscol WRF	150	60	0*
Ellis Creek WRF	150	50	20

NOTE: * Previously excavated

SOURCE: ESA, 2018

At various locations within the construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. Staging areas would be established in areas near construction zones that are open and easily accessed (e.g., vacant lots). In some cases, staging areas may be used for the duration of NBWRP Phase 2. In other cases, as pipeline construction moves along the route, the staging area may also be moved along and within the route to minimize hauling distances and avoid disrupting any one area for extended periods of time. Contractors are expected to negotiate short-term temporary easements for staging areas. The location of the staging areas would be determined by the contractor and would typically be located every three miles along the pipeline alignment. Generally, the staging areas would be located in previously disturbed or non-vegetated areas with protection barriers to adjacent sensitive areas. The maximum size of these staging areas would be approximately one acre. Additional staging areas could be located within the 25-foot construction corridor along the pipeline alignment.

3.14.1.3 Cultural History

A summary of cultural history of the northern San Francisco Bay Area in provided in **Appendix 3.14A.** Because archaeological regions can represent large geographic areas and display some cultural homogeneity, a discussion of the environmental, prehistoric, ethnographic, and historic contexts is useful in order to evaluate the Project impacts to cultural resources in the NBWRP Phase 2 area.

3.14.1.4 Cultural Resources Identification Methods

The effort to identify cultural resources in the Project area consisted of researching archives, conducting field surveys, subsurface testing, geoarchaeological modeling, and consultation with Native Americans organizations/Tribes.

Archival Methods

ESA completed a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University in April 2008 (File No. 07-1558) and updated on May 14, 2017 (File No. 16-1520). Further research was conducted using the files and literature at ESA. The records search included a ¼-mile radius of the NBWRP Phase 2 APE, and was completed in order to: 1) determine whether known cultural resources have been recorded within the vicinity of the proposed Action; 2) assess the likelihood of unrecorded cultural resources based on historical references, and, 3) review the distribution of environmental settings of nearby site locations.

Included in the review were the California Inventory of Historical Resources (OHP, 1976), California Historical Landmarks (OHP, 1996), California Points of Historical Interest (OHP, 1992), and the Historic Properties Directory Listing (OHP, 2008). The Historic Properties Directory includes listings of the National and California Registers (May 2012). Historic-era aerial imagery, topographic maps, and geological maps were also reviewed.

Survey Methods

ESA completed a pedestrian and cursory survey of the Project APE. Pedestrian survey consisted of intensively walking the APE in narrow (10–20 meter wide) transects. Cursory survey consisted of "windshield" survey in paved and built-upon areas combined with pedestrian survey in areas with limited exposed ground surface. The intensity of the survey used was dependent on the environmental conditions and predicted archaeological sensitivity of a given area.

Because the proposed pipeline routes are predominantly located within established, paved road rights-of-way, standard pedestrian methods for identifying surface evidence of archaeological resources are less valuable and effective in obtaining positive results. Therefore, the driving survey was conducted for the roadway segments of the proposed pipeline routes. Roadways with large shoulders and segments of roadways that intersected with perennial or intermittent streams and creeks were more closely examined by walking and examining the surface. Segments of pipeline routes that diverted off roads and onto parcels of private land were studied using a pedestrian survey. A subsurface survey, consisting of shovel probes, was conducted at one location to determine whether a previously recorded archaeological site extended in the road right-of-way.

Resources that appeared to be at least 50 years old or older (the minimum age threshold for consideration to the California Register and National Register; see **Appendix 3.14A Regulatory Framework**) were documented through digital photography and on Department of Parks and Recreation forms and assessed to identify historical resources for CEQA purposes and historic properties for the NHPA. Current conditions of previously recorded resources were also addressed. The results of the survey effort are provided in **Section 3.14.1.5 Records Search and Survey Results** and **Appendix 3.14A**.

Native American Consultation

Pursuant to 36 CFR § 800.4(a)(4), Reclamation as lead Federal Agency invited the Federated Indians of the Graton Rancheria, the Mishewal Wappo Tribe of Alexander Valley, and the Yoche Dehe Wintun Nation, to assist in identifying historic properties of concern that may be affected by the proposed undertaking. Pursuant to AB 52 of the CEQA, on behalf of NBWRA, ESA also has coordinated with the tribes above to identify issues or concerns pertinent to cultural places of concern. To date, Reclamation and ESA have met with the Federated Indians of the Graton Rancheria and the Yoche Dehe Wintun Nation. Reclamation and NBWRA will continue to work with the tribes through the design and implementation of the NBWRP Phase 2 projects.

3.14.1.5 Records Search and Survey Results

Archaeological Resources

Results of the records search indicate that eight prehistoric archaeological resources, one historic-era archaeological resources, and two resources with both prehistoric and historic-era components have been previously recorded within a ¼-mile radius of the proposed Action. The 2010 Caltrans Historic Bridge Inventory was reviewed and no bridges inventoried or listed in the National Register are in the proposed Action area. A description of these resources, the results of the current survey effort, and a geological analysis for each service area are provided in **Appendix 3.14A**. A summary of Record Search and Survey Results by Member Agency is provided in **Appendix 3.14A.**

3.14.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Cultural Resources and Tribal Cultural Resources issues and used to determine the significance criteria presented in Section 3.14.3.1 is found in **Appendix 3.14A**.

3.14.3 Direct and Indirect Effects

3.14.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant impact on cultural resources if it would cause:

1. A substantial adverse change in the significance of a historical resource that is either listed or eligible for listing in the California Register or a local register of historic resources;
2. A substantial adverse change in the significance of a unique archaeological resource;
3. Disturbance of human remains, including those interred outside of dedicated cemeteries.
4. An adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe.

3.14.3.2 Significance Criteria under NHPA

Section 106 of the NHPA requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally-assisted undertaking, or issuing licenses or permits, must consider the effect of the proposed undertaking on historic properties. An historic property may include a prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register. If an undertaking may have an adverse effect, the first step is to identify the APE and significant cultural resources.

A significant impact would occur if a proposed action results in an adverse effect to a property that is listed in or eligible for inclusion in the National Register. The specific Criteria of Effect and Adverse Effect, as defined in 36 CFR Section 800.9, used to evaluate an undertaking's effect on a historic property, are as follows:

1. An undertaking has an effect on a historic property when it may alter the characteristics of the property that qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
2. An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
    a. Physical destruction, damage, or alteration of all or part of the property;
    b. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
    c. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
    d. Neglect of a property resulting in its deterioration or destruction; and
    e. Transfer, lease, or sale of the property.

3.14.3.3 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is likely that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.0 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.14.1: Impacts or Adverse Effects to Archaeological Resources, Human Remains, and Tribal Cultural Resources (Less than Significant with Mitigation / Significant and Unavoidable)

This impact discussion focuses on archaeological resources, human remains, and tribal cultural resources that are considered historical resources or unique archaeological resources (for the purposes of CEQA), or historic properties (for the purposes of the NHPA).

Proposed Action

The impacts to archaeological resources, human remains, and tribal cultural resources under the NBWRP Phase 2 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. A discussion of impacts by Member Agency is provided below.

Novato SD

Based on the results of the background research and survey effort, there are no prehistoric or historic-era archaeological resources in the Novato SD Recycled Water Facility or the proposed Novato SD distribution pipelines. In addition, the proposed pipeline would be installed within an artificially-constructed levee and there would be no ground disturbance to native soils. While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action, construction could encounter previously unrecorded resources. Impacts to previously unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced with implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. **Mitigation Measure 3.14.1a** would ensure that in the event cultural resources are identified during Project implementation, work would halt in the immediate vicinity and a qualified professional archaeologist would inspect the find to provide appropriate treatment recommendations, as necessary. **Mitigation Measure 3. 14.1b** would ensure that in the event of a discovery of human remains, the County Coroner would be called to inspect the find and the Native American Heritage Commission would be notified to identify a Most Likely Descendant, as necessary. **Mitigation Measure 3.14.1c** would ensure that when staging areas are delineated for the Project, a cultural resources assessment be completed to determine whether there are significant cultural resources, recommend options to avoid significant resources, and/or develop appropriate treatment plans for significant cultural resources. Implementation of these measures would reduce impacts to archaeological resources, human remains, and tribal cultural resources to a **less than significant with mitigation**.

SVCSD

A portion of the SVCSD distribution pipeline APE is considered to have a high potential for buried paleosols and related archaeological resources and, therefore, high archaeological sensitivity. While there are no known archaeological resources or tribal cultural resources in the APE, there is a higher potential to encounter previously unrecorded resources than in other parts of the NBWRP Phase 2 area. Impacts to previous unidentified archaeological resources or tribal cultural resources would be potentially significant. While it is preferable to identify sites before they are impacted, a pre-construction subsurface study is not feasible given the obscuring pavement and highly traveled nature of the roadway. Therefore, implementation of **Mitigation Measure 3.14.1d**, which would require a qualified professional archaeologist to monitor excavation in areas of high archaeological sensitivity, would ensure that archaeological resources, should they exist, be immediately identified and appropriately treated. Implementation of this measure would reduce this impact to **less than significant with mitigation**.

Based on the results of the background research and survey effort, there are no known prehistoric or historic-era archaeological resources in the SVCSD distribution pipeline APE. While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action, construction could encounter previously unrecorded resources. Impacts to previously unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. This impact would be reduced by implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. Implementation of these measures would reduce this impact to **less than significant with mitigation**.

MMWD

Based on the results of the background research and survey effort, there are no known prehistoric or historic-era archaeological resources in the CMSA Treatment Facility or in the MMWD distribution pipeline APE. While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action, construction could encounter previously unrecorded resources. Impacts to previously unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced by implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. Implementation of these measures would reduce this impact to **less than significant with mitigation**.

Napa SD

Based on the results of the background research and survey effort, there are no known prehistoric or historic-era archaeological resources within the Soscol WRF and there would be no impacts to archaeological resources, tribal cultural resources, or human remains from upgrades within the existing facility. There is, however, a previously recorded and legally-significant archaeological resource (CA-NAP-860/H) in the vicinity of the proposed Storage Pond. For the purposes of the NBWRP Phase 2 Project, archaeological site CA-NAP-860/H is considered eligible for listing in the California Register of Historical Resources (California Register) and National Register of Historic Places (National Register) and is therefore considered a historical resource for the purposes of CEQA. Impacts to a historical resource would be a significant impact.

For Storage Pond Option A, impacts to a historical resource (site CA-NAP-860/H) would be partially reduced by implementation of **Mitigation Measure 3.14.1e**, which would require a detailed Archaeological Research Design and Treatment Plan be developed. This mitigation measure also requires a Native American monitor be present during any ground disturbing activities, including data recovery, as appropriate. If Option A is implemented, **Mitigation Measure 3.14.1e** would reduce impacts, however it would not reduce impacts to a less-than-significant level and the impact would remain **significant and unavoidable**. If CA-NAP-860/H is also determined to be a tribal cultural resource as defined in PRC Section 21080.3.1, additional actions may be defined following consultation between the appropriate Native American tribe(s) and Napa SD.

For Storage Pond Option B, there would not be a direct impact to a historical resources (site CA-NAP-860/H), however there would be a heightened archaeological sensitivity in the proposed Storage Pond APE. Implementation of **Mitigation Measure**

3.14.1d, which would require a qualified professional archaeologist to monitor excavation and would ensure that archaeological resources, should they exist, be immediately identified and appropriately treated, would reduce impacts to **less than significant with mitigation**. This mitigation measure also requires that a Native American monitor is present during construction activities, as appropriate.

City of Petaluma

Based on the results of the background research and survey effort, there are no known prehistoric or historic-era archaeological resources in the Ellis Creek WRF or in the urban distribution pipelines. There are three prehistoric archaeological resources in the vicinity of the agricultural distribution pipelines. Despite the negative survey and subsurface survey results and the previous disturbance in the Project area, there remains a moderate archaeological sensitivity for the portion of the Project area in the vicinity of CA-SON-198. In addition, portions of the City of Petaluma urban and agricultural distribution pipeline APE are considered to have a high potential for buried paleosols and related archaeological resources and, therefore, high archaeological sensitivity. While there are no known archaeological resources or tribal cultural resources in the APE, there is a higher potential to encounter previously unrecorded resources than in other parts of the NBWRP Phase 2 area. Impacts to previous unidentified archaeological resources or tribal cultural resources would be potentially significant. While it is preferable to identify sites before they are impacted, a pre-construction subsurface study is not feasible given the obscuring pavement and highly traveled nature of the roadway. Therefore, implementation of **Mitigation Measure 3.14.1d**, which would require a qualified professional archaeologist to monitor excavation in areas of high archaeological sensitivity, would ensure that archaeological resources, should they exist, be immediately identified and appropriately treated. This mitigation measure also requires that a Native American monitor is present during construction activities, as appropriate. Implementation of this measure would reduce this impact to **less than significant with mitigation**.

While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action in the remaining portions of the City of Petaluma Project area, Project construction could encounter previously unrecorded resources. Impacts to previously unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced by implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. Implementation of these measures would reduce this impact to **less than significant with mitigation**.

City of American Canyon

Based on the results of the background research and survey effort, there are no known prehistoric or historic-era archaeological resources in the City of American Canyon Project area. While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action, construction could encounter previously unrecorded resources. In addition, based on consultation efforts with the culturally affiliated Native American tribe, portions of the American Canyon distribution pipeline APE are considered to have the potential for buried archaeological resources and, therefore, high archaeological sensitivity. Implementation of **Mitigation Measure 3.14.1d**, which would require a qualified professional archaeologist and a Native American representative to monitor excavation in areas of high archaeological sensitivity, would ensure that archaeological resources, should they exist, be immediately identified and appropriately treated.

While no known archaeological resources or tribal cultural resources would be impacted by the proposed Action in the remaining portions of the City of American Canyon Project area, Project construction could encounter previously unrecorded resources, which would be a significant impact. Impacts would be reduced by implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. Implementation of these measures would reduce this impact to **less than significant with mitigation**.

Program Elements

When specific plans are available for each phase of Program-level activity, a Project-level cultural resources review should be prepared. Impacts to previously recorded or unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced to a less-than-significant level by implementation of **Mitigation Measure 3.14.1f**, which would ensure that when Program-level plans are at a Project-level of detail, a cultural resources assessment be completed to determine whether there are significant cultural resources, recommend options to avoid significant resources, and/or develop appropriate treatment plans for significant cultural resources. Implementation of this measure would reduce this impact to **less than significant with mitigation**.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, under future baseline (2020) conditions, cultural resources within the region are anticipated to remain unchanged. Archaeologists and ethnographers have documented that the greater area was intensively occupied by Native American groups. Coast Miwok, Wappo, and Patwin settlements focused on bays and estuaries, near perennial interior watercourses and springs, at the confluence of watercourses, along mid-slope terraces, and along ridgelines. The greater area incorporates all of these elements and was, therefore, a highly favored location for prehistoric populations.

Historic-era cultural resources have also been recorded in the greater area. The presence of a number of historic-era buildings, structures, and archaeological sites indicates intensive use and occupation throughout the historic period, which is reflected in material remains, both archaeological sites and the built environment.

While no known archaeological resources or tribal cultural resources would be impacted by the Proposed Action, construction could encounter previously unrecorded resources. Impacts to previously unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced by implementation of **Mitigation Measures 3.14.1a, 3.14.1b**, and **3.14.1c**. Implementation of these measures would reduce this impact to **less than significant with mitigation**.

Storage Alternative

Record search indicates that some of these facilities would potentially impact previously identified cultural resource locations. Implementation of the Storage Alternative would increase the level of disturbance at four storage locations; the potential for disturbance and unknown discovery would be increased proportional to the facilities proposed. Impacts to previously recorded or unrecorded archaeological resources, tribal cultural resources, or human remains would be a significant impact. The impact would be reduced to a less-than-significant level by implementation of **Mitigation Measure 3.14.1f**, which would ensure that in the event this alternative is selected, a cultural resources assessment be completed to determine whether there are significant cultural resources, recommend options to avoid significant resources, and/or develop appropriate treatment plans for significant cultural resources.

Mitigation Measures

Mitigation Measure 3.14.1a: Inadvertent Discoveries. If prehistoric or historic-era archaeological resources are encountered, the contractor shall immediately cease all work within 100 feet of the discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation, the contractor shall immediately contact the NBWRA and the appropriate Member Agency. The contractor shall not resume work until authorization is received from the appropriate Member Agency.

1. In the event of unanticipated discovery of archaeological resources during construction, the Member Agency shall retain the services of a qualified professional archaeologist (defined as an archaeologist that meets the Secretary of the Interior's Standards) to evaluate the significance of the find prior to resuming any activities.
2. If it is determined that the Project could damage a historical resource or a unique archaeological resource (pursuant to CEQA) or a historic property (pursuant to NHPA), mitigation shall be implemented with a preference for preservation in place. This may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If the site cannot be avoided, a qualified professional archaeologist shall prepare and implement a detailed research design and treatment plan in consultation with the Member Agency and the affiliated Native American tribe(s), as appropriate. Treatment for most resources would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Project. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals.

Mitigation Measure 3.14.1b: Discovery of Human Remains. If potential human remains are encountered, the appropriate Member Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with PRC Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission. As provided in PRC Section 5097.98, the Commission shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.

Mitigation Measure 3.14.1c: Cultural Resources Assessment for Staging Areas. When locations for staging are defined, the staging areas should be subject to a cultural resources investigation completed by a qualified professional archaeologist that includes, at a minimum:

1. An updated records search at the NWIC;
2. An intensive survey of the staging areas;
3. A report disseminating the results of this research;

4. Recommendations to avoid impacts to identified resources that qualify as historical resources, unique archaeological resources, tribal cultural resources, or historic properties; and
5. If resources cannot be avoided, provide recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.

Mitigation Measure 3.14.1d: Cultural Resources Monitoring. Prior to authorization to proceed, or issuance of permits, the appropriate Member Agency shall prepare a cultural resources monitoring plan. Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas delineated as sensitive for cultural resources (as shown in ESA, 2018). A qualified professional archaeologist shall prepare the plan, in coordination with the culturally affiliated Native American tribe(s). The plan shall address (but not be limited to) the following issues:

1. Clear delineation and fencing of sensitive cultural resource areas requiring monitoring;
2. Training program for all construction and field workers involved in site disturbance;
3. Person(s) responsible for conducting monitoring activities, including Native American monitors, if necessary;
4. Person(s) responsible for overseeing and directing the monitors;
5. Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
6. Procedures and construction methods to avoid sensitive cultural resource areas;
7. Physical monitoring boundaries;
8. Protocol for notifications in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation);
9. Methods to ensure security of cultural resources sites;
10. Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction.

If an intact archaeological deposit is encountered, all soil-disturbing activities within 100 feet of the find shall cease until the deposit is evaluated. The archaeological monitor shall immediately notify the appropriate Member Agency of the encountered archaeological resource. The protocol outlined in **Mitigation Measure 3.14.1a** and **Mitigation Measure 3.14.1b** would be implemented.

Mitigation Measure 3.14.1e: Archaeological Research Design and Treatment Plan. This mitigation measure applies to the Soscol WRF operational storage pond Option A. During the final development design of the proposed operational storage pond Option A, and prior to submittal of a building permit or grading application to the County of Napa, Napa SD shall undertake the following:

1. ***Preservation in Place.*** A qualified archaeologist, in consultation with Napa SD and the appropriate Native American representative(s) shall determine whether preservation in place of site CA-NAP-860/H is feasible. Consistent with CEQA Guidelines Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement.

If it is determined that preservation in place is not feasible for the resource and another type of mitigation would better serve the interests protected by CEQA, mitigation of the project impacts on the archaeological research values of the site shall include testing and data recovery through archaeological investigations and Napa SD shall undertake the following:

1. ***Archaeological Research Design and Treatment Plan.*** Because a significant archaeological resource (CA-NAP-860/H) has been previously identified in the project area, Napa SD shall retain a Secretary of the Interior-qualified archaeologist, in consultation with a Native American representative(s), to prepare and implement an Archaeological Research Design and Treatment Plan (ARDTP). The ARDTP will include how a data recovery program would preserve the significant information the archaeological resource is expected to contain. Treatment would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim of targeting the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the project. The ARDTP shall include provisions for analysis of data in a regional context; reporting of results within a timely manner and subject to review and comments by the appropriate Native American representative, before being finalized; curation of artifacts and data at a local facility acceptable to the appropriate Native American representative; and dissemination of final confidential reports to the appropriate Native American representative, the Northwest Information Center of the California Historical Resources Information System, and Napa SD.

Mitigation Measure 3.14.1f: Program Elements and Storage Alternative: Cultural Resources Assessment. If this alternative is selected, the appropriate Member Agency will conduct a cultural resources investigation prepared by a qualified professional archaeologist that includes, at a minimum:

1. An updated records search at the NWIC;
2. An intensive cultural resources survey of the Project area;
3. A report disseminating the results of this research;
4. Recommendations to avoid impacts to identified resources that qualify as historical resources, unique archaeological resources, tribal cultural resources, or historic properties; and
5. Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.

Significance after Mitigation: Less than Significant / No Adverse Effect
(Napa SD Soscol Storage Pond Option A: Significant and Unavoidable)

Impact 3.14.2: Impacts or Adverse Effects to Architectural Resources (No Impact)

This impact discussion focuses on architectural and structural resources that are considered historical resources (for the purposes of CEQA) or historic properties (for the purposes of the NHPA).

Proposed Action

Proposed construction would occur within existing public rights-of-way and would avoid direct impacts to historic-era architectural resources. Based on the above analysis there are no architectural resources that qualify as historical resources or historic properties in the Project area or that would be impacted by the proposed Action. Trenching and backfill operations during construction would not have indirect impacts to architectural resources; the disturbance would be temporary and construction areas would be restored to pre-Project conditions after construction. Under CEQA, there would be **no impact**.

Program Elements

The impacts to historic-era architectural resources under Phase 1 would be equivalent to and greater than the impacts discussed for the No Action Alternative, in proportion to the facilities constructed under this alternative. When specific plans are available for each phase of program-level activity, a Project-level cultural resources review should be prepared. Impacts to historic-era architectural resources determined to be historic properties or historical resources would be a significant impact. The impact would be reduced by implementation of **Mitigation Measures 3.14.1f**. Implementation of this measure would reduce this impact to **less than significant with mitigation**.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, there are no architectural resources that qualify as historical resources or historic properties in the Project area or that would be impacted by the proposed Action Under CEQA, there would be **no impact**.

Storage Alternative

There are three historic-era bridges in the Napa SD distribution pipeline Project area identified during the Phase 1 assessment. These bridges were recommended not eligible as historical resources or historic properties. Record searches indicate there are no other known architectural resources that qualify as historical resources or historic properties in the Storage Alternative Project area. As there are no architectural resources that qualify as historical resources or historic properties in the Project area or that would be impacted by the proposed Action Under CEQA, there would be **no impact**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

3.14.3.4 Impact Summary by Service Area

Appendix 3.14B provides a summary of potential Project impacts per Member Agency related to cultural resources and tribal cultural resources.

3.15 Recreation

This section describes recreation resources (e.g., state, regional, and local parks, trails, and other recreational opportunities and facilities) in the project area in Section 3.15.1, *Affected Environment*. Section 3.15.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. Setting information and the Regulatory Framework that governs these resources and considerations is presented in Appendix 3.15A. No comments or other input were received during the scoping period for this EIR/EIS regarding recreational resources.

3.15.1 Affected Environment

3.15.1.1 Novato SD

Regional Trails

A portion of the San Francisco Bay Trail is proposed along Highway 37 from Highway 101 east to the Sonoma County line (ABAG, 2018).

Sonoma Marin Area Rail Transit Paths

The Sonoma Marin Area Rail Transit (SMART) system has recently been developed and implemented to provide passenger rail service to residents and visitors to the North Bay area region. The full SMART system plans to provide 70 miles of passenger rail service extending from Cloverdale on the north to Larkspur on the south. As part of this transit system, a bicycle-pedestrian pathway is being developed along the corridor (SMART, 2017). In the NBWRP Phase 2 area within the Novato SD service area, this pathway is proposed, but not yet completed.

City of Novato

The City of Novato owns over 59 acres of developed parks and 169 acres of undeveloped future park lands. There are two city parks within a one-mile radius of the Novato Wastewater Treatment Plant (WWTP, including the Recycled Water Facility [RWF]). Scottsdale Pond Park providing a pond, fishing pier and gazebo is located west of Highway 101 at Redwood Boulevard and Rowland Boulevard. Slade Park containing a barbeque and picnic area, multi-use turf area, and play structure, is located at 593 Manuel Drive (City of Novato, 2018). There are existing and proposed Class I, Class II and Class III bikeways in the Novato SD project area. The bikeways are along Redwood Boulevard, Olive Avenue, Rowland Boulevard, Hill Road, Atherton Boulevard, and Novato Avenue.

Marin County

The Deer Island Open Space Preserve, owned and managed by the Marin County Open Space District, is a 154-acre preserve that was once part of the extensive wetlands of the Petaluma River Delta. With several trails, this preserve is along Lower Novato Creek is utilized by hikers and bird watchers.

3.15.1.2 SVCSD

California State Parks

The California State Parks Department owns and operates Sonoma State Historic Park, which is comprised of six sites throughout the northern part of the city. The nearest site to the Phase 2 Program area is the Vallejo Home located at the northern end of 3rd Street West and La Casa Grande.

The Sonoma County Agricultural Preservation and Open Space District (District) purchased the 157-acre Montini Ranch, the greenbelt area just north of the City of Sonoma. In 2014, the District transferred ownership of the Montini Ranch to the City of Sonoma as the Montini Open Space Preserve. 98 acres of oak woodlands containing hiking trails are currently open to the public for recreational use (Sonoma County Open Space District, 2017).

City of Sonoma

There are approximately 240 acres of parkland within and adjacent to the City of Sonoma (City of Sonoma, 2004). City recreational facilities within one mile of NBWRP Phase 2 elements include: Sonoma City Park (The Plaza) at the intersection of Broadway and Napa Street; Arnold Field, Field of Dreams, and Depot Park on 1st Street West, north of the Sonoma Multi-Use Trail; Eraldi Park on 4th Street West; Pinelli Park on France Street; and Olson Park along the western segment of the Sonoma Multi-Use Trail. Other than Pinelli Park, which is located approximately one mile to the north of the proposed recycled water pipeline (along Napa Road), there are no other city parks or other recreational facilities located in the vicinity of this proposed Project.

The Sonoma Multi-Use Trail provides pedestrian and bicycle access along an old railroad right-of-way north of Spain Street. The path, which is used for bike riding, roller blading, walking, and running, has a paved right-of-way of roughly 10 feet with clear shoulders on each side. The trail traverses through Sonoma State Historic Park and Depot Park, provides an east-west corridor within the city, and provides access to recreation areas. The trail is located approximately 0.2 mile from NBWRP Phase 2 elements.

Sonoma County

The Sonoma County Regional Parks Department (SCRPD) owns and operates more than 50 recreational areas, six of which are in Sonoma Valley (SCRPD, 2017). County parks within one mile of the Valley of the Moon NBWRP Phase 2 element include Maxwell Farms Regional Park (located on Verano Avenue in Sonoma, on 85 acres comprising multi-use fields), MacDougal Skateboard Park, and Valley of the Moon Boys & Girls Club.

SCRPD is developing a regional trail system to link various parks and expand hiking and equestrian opportunities (Sonoma County, 2015). The Sonoma Trail is located in the project area and would follow the existing bike path in the northern part of the City of Sonoma, then extend south along 8th Street East to Highway 121/12. The Sonoma Trail would be a multiple-use trail allowing hiking, biking, and equestrian use.

The 2010 Sonoma County Bicycle and Pedestrian Plan describes existing bikeways and proposed bikeways that are estimated for completion within five to 25 years. In the area of the NBWRP Phase 2 elements, there are both existing and proposed Class I, Class II and Class III bikeways. In general, there are existing and proposed bikeways along the alignment of the recycled water pipeline on Napa Road and in the vicinity of the City of Sonoma storage tanks (SCTA, 2014).

3.15.1.3 MMWD

Regional Trails

San Francisco Bay Trail. The Association of Bay Area Government (ABAG) manages and maintains the Bay Trail, which is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. A portion of the San Francisco Bay Trail are located along Andersen Avenue at the Central Marin Sanitary Agency (CMSA) wastewater treatment facility (WWTP). Trail mapping shows future trail segments along Sir Francis Drake Boulevard along the San Quentin Prison grounds (ABAG, 2018).

City of San Rafael

Within San Rafael there are 19 City-owned parks plus the joint Mont Marin Homeowners Association/City-owned-park for a total of 141 acres of parkland. There are two local parks in the vicinity of the NBWRP.

The San Rafael Bicycle and Pedestrian Plan is the product of a collaborative effort of the City of San Rafael Department of Public Works, San Rafael Bicycle and Pedestrian Advisory Committee, consultants Alta Planning Design, and members of the public. The purpose of the plan is to integrate proposed bicycle and pedestrian infrastructure improvements into San Rafael's overall transportation plan. In the project area, there are existing Class II and Class III bikeways (Marin County, 2008).

City of Larkspur

The City of Larkspur manages one regional park and 10 neighborhood parks and greenways. There are neighborhood mini parks in the vicinity of the proposed San Quentin Prison Recycled Water Distribution System including Remillard Park on East Sir Francis Drake Boulevard within 0.25 mile of the park. This park includes a freshwater marsh and wildlife sanctuary and has been utilized for bay fishing from the levee and as a kayak launch, though this is discouraged given its close proximity to the Larkspur-SF Ferry route (City of Larkspur, 2017).

Marin County

The Marin County Parks and Open Space Department owns and operates 459 acres of parks. In addition, 464 linear miles of trails are open to the public, including 26 miles of paved pathways. The Marin Countywide Bicycle Plan also identifies designated bikeways throughout the county. In the NBWRP Phase 2 area in or near San Rafael, there are existing Class II and Class III bikeways.[1] The County of Marin initiated the spring of 2010 to study ways to improve access for non-motor vehicle transportation in the area. Some

[1] There are three categories of bikeways:
a. Class I Bicycle Pathway: a bike path for the exclusive use of bicycles. It is separated from the road by space or a barrier. A Class I bikeway may be on part of a road right-of-way or on a separate right-of-way.
b. Class II Bicycle Lane: a bike lane on a right-of-way primarily used by bicycles. Motor vehicles and pedestrians are not permitted on Class II bikeways, although vehicle parking is permitted. Class II bike lanes are separated from motorized vehicle travel lanes by a solid white stripe.
c. Class III Bicycle Route: a bike route which shares its right-of-way with either motor vehicles or pedestrians. Class III bike routes can include roadways with shoulder striping.

access improvements identified in the San Quentin Area Bicycle and Pedestrian Access Study are being implemented, including improving bicycle and pedestrian access for the north approach on the Richmond San Rafael Bridge near the CSMA WWTP (MTC, 2017).

3.15.1.4 Napa SD

Regional Trails

San Francisco Bay Trail. There are a number of proposed San Francisco Bay Trail routes in the Napa SD service area. A proposed segment along Imola Avenue would be in the NBWRP Phase 2 vicinity, as well as another segment along in east bank of the Napa River adjacent to the Soscol Water Recycling Facility (WRF). The proposed Ridge Trail route in the North Bay would be in the vicinity of the NBWRP from the City of Napa to Skyline Park, adjacent to the proposed Napa SD Napa State Hospital Storage Tank (one of the Program Elements).

City of Napa

The City of Napa's park system currently totals more than 800 acres at 57 park and open space sites, of which 494 acres are improved for active recreation and 325 acres are minimally improved for passive uses or remain unimproved (City of Napa, 2009). There are two neighborhood park facilities in the NBWRP Phase 2 vicinity; however, they are not adjacent to any proposed elements.

Napa County

The majority of Napa County's open space is concentrated primarily in the eastern portion of the County. Skyline Park, located at 2201 Imola Avenue, is an 850-acre open space regional park that is owned by the state but operated and maintained by a non-profit organization through a lease by Napa County. The park offers several activities including camping, RV amenities, and miles of hiking, mountain biking and equestrian trails, an archery range, and a native plant garden. A proposed NBWRP Phase 2 pipeline alignment is proposed near the River to Ridge Trail in this park.

3.15.1.5 City of Petaluma

Regional Trails

The Bay Area Ridge Trail

Bay Area Ridge Trail Council (Council), consisting of representatives of the Golden Gate National Recreation Area and the Greenbelt Alliance, manages and maintains the Bay Area Ridge Trail. Approximately 27 miles of this trail are located in Sonoma County with significant portions in the Petaluma area (Petaluma, 2012). In the NBWRP Phase 2 area in Petaluma, this trail incorporates portions of the Lynch Creek Trail.

City of Petaluma

Petaluma Parks and Recreation maintains numerous parks in the city near proposed Phase 2 Program elements. The closest parks to the urban recycled water expansion project are Miwok Park (1021 St. Francis Ave.), Rocky Memorial Dog Park (2204 Casa Grande Rd.), La Tercera (1645 Peggy Lane), Luchessi Park (320 N. McDowell Blvd.) and Shollenberger Park (1400 Cader Lane). Shollenberger Park contains 16 acres of wetlands with public trails connecting to the Ellis Creek WRF through the Alman Marsh (Petaluma, 2017).

The Ellis Creek WRF occupies 90 up-slope acres on a 270-acre site in southeast Petaluma and includes 30 acres of polishing wetlands, as well as seasonal wetlands providing wildlife viewing opportunities (Petaluma Wetlands Alliance, 2017). The wetlands site is open to the public from dawn to dusk, except for specific sewage treatment areas and brackish marshlands, which are protected (closed) during nesting season. There are three miles of trails at Ellis Creek WRF, including a connector trail to Shollenberger Park (Petaluma, 2012) There are existing Class I bikeways along the Petaluma Marsh Trail and proposed Class II bikeways along Lakeville Highway.

3.15.1.6 City of American Canyon

Regional Trails

Napa River Bay Trail

The Napa River Bay Trail portion of the San Francisco Bay Trail runs along Wetlands Edge Road located along the western side of the city is a dedicated trail along the bay extending from Kensington Way on the south side to Eucalyptus Drive on the north, connecting to an extensive trails network along the Napa River with access to wetlands which provides wildlife viewing and other recreational opportunities (City of American Canyon, 2018). Several recycled water expansion pipelines are proposed near the

Bay Trail which would connect to existing recycled water main to extend service to local parks and schools within the City of American Canyon.

City of American Canyon

The City of American Canyon provides numerous city parks including La Vigne Park, several athletic ball fields, sports courts, and a newly constructed skate park for city residents. NBWRP Phase 2 elements would deliver recycled water for irrigation of La Vigne Park and the city's ball fields, replacing the potable water currently serving these recreational facilities.

3.15.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Recreation issues which were used to determine the significance criteria presented in **Section 3.15.3.**1 is found in **Appendix 3.15A**.

3.15.3 Direct and Indirect Effects

3.15.3.1 Significance Criteria

Based on the **Appendix G** of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant impact on recreation resources if it would:

1. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
2. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

3.15.3.2 Impacts Not Further Evaluated

NBWRP Phase 2 and alternatives would have no impact related to the construction or expansion of recreational facilities. There are no recreational facilities proposed as part of the program. While many of the Phase 2 Program elements would serve existing recreational facilities, it is intended to offset potable water use for irrigation and not intend to facilitate the expansion of existing facilities or the creation of new facilities.

3.15.3.3 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative would include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of this Alternative would result in a combined construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6, 819 AFY of recycled water supply.

Impact 3.15.1: Temporary disturbance. Project construction could result in short-term disturbance adjacent to recreational facilities. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

The projects under the No Action Alternative would be constructed in areas that are not utilized for recreational purposes. Therefore, there would be **no impact** to recreational resources.

Proposed Action

NBWRP Phase 2 construction would occur within some established bikeways and trails. Trucks would cross some access routes and bikeways in and along facility access roads to deliver construction equipment and materials, which could damage these recreational facilities.

Project construction-related impacts on recreational resources, if any, would be short-term in duration and would not result in increased use or physical deterioration of the facilities or other recreational resources. At the conclusion of construction, all surfaces would be restored to pre-project conditions, therefore impacts on recreational resources would not result in any permanent physical deterioration. Construction and operation of NBWRP Phase 2 would not lead to increased use of recreational facilities such that physical deterioration of the facilities would occur. A discussion of impacts per service area is provided in **Table 3.15-1** below.

Novato SD

Novato SD RWF Capacity Expansion. The upgrades proposed at the Novato SD RWF would increase tertiary treatment and disinfection capacity; all construction and operation for this project would occur within the existing facility. The proposed capacity expansion associated with this project would provide additional recycled water throughout the Novato SD service area to offset current potable water use for irrigation. While there is potential for increased use of recreational sites, a significant increase in use is not likely to occur as a result of NBWRP Phase 2, as demand for recreational uses would be shared throughout the region. Therefore, there would be **no impact.**

Lower Novato Creek Project 1 – Distribution. Construction of the 1.1-mile Lower Novato Creek Recycled Water Pipeline would occur near trails in the adjacent Deer Island Open Space Preserve utilized by hikers and other wildlife enthusiasts. Although in close proximity, these construction activities would not create deterioration of these trails. Therefore, there would be **no impact** to these facilities.

Turnout to Transitional Wetlands (Hamilton-Bel Marin Keys Wetland Restoration Project). The area surrounding the turnout is not located along any publicly-access trail, bikeways, or other recreational feature. Therefore, there would be **no impact**.

SVCSD

Napa Road Recycled Water Pipeline. Construction of the recycled water expansion along Napa Road would involve trenching activities and require temporary excavation or closure of the Class II bike lane along this 2-mile segment. This would be considered significant for the duration of construction. Therefore, **Mitigation Measure 3.15.1** is proposed to reduce this impact to a less-than-significant level with the provision of detour routes to allow cyclists uninterrupted passage through the area. At the conclusion of construction, all surfaces would be restored and restriped such that the bike routes would again be usable, as indicated in Section 2.10.1.5, Surface Restoration. Therefore, impacts would be **less than significant with mitigation**.

MMWD

San Quentin Recycled Water Distribution System. NBWRP Phase 2 would involve the construction of a pipeline to deliver recycled water from the CMSA treatment facility to San Quentin State Prison. Work would be conducted along Andersen Drive and Sir Francis Drake Boulevard to the access road at the prison. Users of the San Francisco Bay Trail or bikeways may experience temporary disturbances related to pipeline construction, due to closures, etc. However, at the conclusion of construction, all surfaces would be restored to pre-project conditions, as indicated in Section 2.10.1.5, Surface Restoration. Therefore, impacts on these bikeways would be less than significant.

Napa SD

Soscol WRF Increased Filter Capacity and Covered Storage. The proposed Soscol WRF Increased Filter Capacity Project upgrades and Covered Storage Project would occur within the bounds of the existing water treatment facility. The proposed upgrades would not involve or include any recreational facilities, nor would it increase the use of existing recreational resources such that physical deterioration would occur. Therefore, there would be **no impact**.

City of Petaluma

Petaluma Ellis Creek WRF Increased Capacity and Tertiary Filtration Upgrades. The upgrades proposed at the Ellis Creek WRF would involve placement of tertiary filters, filter cells, and UV lamps into previously constructed channels. This work would occur within the active treatment area of the facility, which is not publicly-accessible. This element would not affect any recreational facilities associated with other areas of the Ellis Creek WRF. Therefore, there would be **no impact**.

TABLE 3.15-1: PROPOSED ACTION TEMPORARY DISTURBANCE TO RECREATIONAL RESOURCES

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	All construction and operation for this project would occur within the existing facility, which is not utilized for recreation. **No Impact.**
Napa SD Soscol WRF	Napa SD	All construction and operation for this project would occur within the bounds of the existing water treatment facility which is not utilized for recreation. **No Impact**.
Ellis Creek WRF	Petaluma	This would occur within the active treatment area of the facility, which is not accessible to the public. There would be **no impact.**
American Canyon WRF	American Canyon	Treatment plan upgrades and modifications at the existing American Canyon Water Reclamation Facility (American Canyon WRF) would occur within the boundaries of an existing facility mainly upon previously disturbed areas. This Project would have **No Impact** on recreation.
CMSA WRF	MMWD	Users of the Class II bikeway along Andersen Drive may experience disturbances related to construction. Impacts on the bikeway would be temporary and **less than significant**.
Pipeline Projects		
Marin County Lower Novato Creek	Marin Co.	Pipeline construction would not cause deterioration of trails in the adjacent Deer Island Open Space Preserve utilized by hikers. There would be **no impact**.
SVCSD Napa Road Pipeline	SVCSD	Construction would involve trenching activities and would likely require temporary lane closures along this two-mile pipeline route. However, at the conclusion of construction all surfaces would be restored and restriped such that the bike routes would again be usable; impacts would be temporary and **less than significant**.
Petaluma Ag Recycled Water	Petaluma	Short-term disturbances to bikeways would be reduced to less-than-significant levels with the incorporation of **Mitigation Measure 3.15.1**. Temporary, construction-related impacts would be **less than significant with mitigation.**
San Quentin Pipeline	MMWD	Temporary disturbances to recreational resources during pipeline construction could occur. However at the conclusion of construction, all surfaces would be restored to pre-project conditions, therefore impacts on these bikeways would be **less than significant**.
Petaluma Urban Recycled Water	Petaluma	**Mitigation Measure 3.15.1** would be implemented such that Member Agencies would identify alternate routes to minimize impact to recreational trails during construction. These impacts would be temporary in nature and **less than significant with mitigation**.
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	The project would mainly utilize existing infrastructure to enable provision of water for environmental enhancement. As the overall footprint for this project is very small, no negative impacts to recreational resources are anticipated to occur with the construction or operation of this project. **No impact.**
Napa SD Soscol Covered Storage	Napa SD	The proposed upgrades would not involve or include any recreational facilities, nor would the Project increase the use of existing recreational resources such that physical deterioration would occur. There would be **No impact.**
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	**Mitigation Measure 3.15.1** would be implemented such that Member Agencies would identify alternate routes to minimize impact to recreational trails during construction. These impacts would be temporary in nature and **less than significant with mitigation**.
Napa SD Napa State Hospital Pipeline	Napa SD	Construction would cross and include lands utilized for recreational purposes and could generate temporary impacts to recreational resources. At the conclusion of construction, all surfaces and trails would be restored to their pre-project conditions. Impacts would be less than significant with the inclusion of **Mitigation Measure 3.15.1**. **(Less than Significant with Mitigation)**
SCWA Potable Water ASR - Sonoma	SCWA	Construction of the Sonoma ASR would not increase uses of neighboring recreational resources, nor would it interfere with the access of those resources in any long-term way. Temporary construction-related impacts would be **less than significant**.

TABLE 3.15-1: PROPOSED ACTION TEMPORARY DISTURBANCE TO RECREATIONAL RESOURCES (CONTINUED)

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	An indirect beneficial impact could occur for restored wetlands near these projects. No new recreational areas are proposed to be constructed as part of this project. Construction-related impacts, would be temporary and **less than significant**.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	Construction would cross and include lands utilized for recreational purposes and could generate temporary impacts to recreational resources. At the conclusion of construction, all surfaces and trails would be restored to their pre-project conditions. Impacts would be less than significant with the inclusion of **Mitigation Measure 3.15.1**. **(Less than Significant with Mitigation)**
SCWA Potable Water ASR - Valley of the Moon	SCWA	There are no recreational facilities that would be affected by this Program Element. Therefore, there would be **no impact**.
SCWA Potable Water ASR - Sonoma	SCWA	Construction of this Program Element would not cause disruption or deterioration of any recreational facility in the area. Therefore, there would be **no impact**.

Urban Recycled Water Expansion. The Urban Recycled Water Expansion would involve construction of 8 miles of water pipelines mainly within roadways in eastern Petaluma. Temporary disturbances such as lane closures and pipeline installation impacting trails and bikeways would be reduced to less than significant levels with the incorporation of **Mitigation Measure 3.15.1** which would entail appropriate coordination with Member Agencies to identify detour routes for impacted bikeways. At the conclusion of construction, all roadways would be restored to pre-project conditions, as indicated in Section 2.10.1.5, Surface Restoration, and staging areas cleared of equipment and debris. Impacts to recreational resources would be temporary in nature and **less than significant with mitigation**.

Agricultural Recycled Water Expansion. The City of Petaluma's Agricultural Recycled Water Expansion would extend recycled water pipelines from the Ellis Creek WRF eastward to provide recycled water for agricultural use in the areas along Highway 116 and Lakeville Highway. Installation of pipelines in or along these roadways would potentially require excavation or closure of existing and proposed Class I and Class II bikeways along these segments. However, these impacts would not be permanent and would be reduced to less-than-significant levels with the incorporation of **Mitigation Measure 3.15.1**. At the conclusion of the construction period, all surfaces, including trails and bikeways, would be restored to their pre-project conditions, as indicated in Section 2.10.1.5, Surface Restoration. Therefore, impacts would be **less than significant with mitigation**.

City of American Canyon

American Canyon WRF Treatment Plant Upgrades. Treatment plan upgrades and modifications at the existing American Canyon Water Reclamation Facility (American Canyon WRF) would occur within the boundaries of that facility. As no recreational resources exist at the WRF, the Proposed Action would have **no impact**.

Recycled Water Distribution System Expansion. The Recycled Water Distribution System Expansion would include construction of seven recycled water pipeline extensions located within existing public roadways to provide recycled water for irrigation of American Canyon Community Park, Community Services Facility and American Canyon Middle School grounds, La Vigne Community Park, and city ballfields.

Although the construction of the proposed pipelines (i.e., trenching, lane closures) would temporarily disrupt these places, and the routes connecting residents and visitors to these facilities, all surfaces, fields and grounds would be restored to their pre-project conditions, as indicated in Section 2.10.1.5, Surface Restoration. Construction-related impacts would be similar to those discussed above and would be reduced to a less-than-significant level with implementation of **Mitigation Measure 3.15.1**. Impacts to recreational resources resulting from NBWRP Phase 2 would be **less than significant with mitigation**.

Program Elements

Novato SD

Construction of the Highway 37 Seasonal Storage project would involve temporary disruption associated with the use of heavy equipment required for excavation of this pond, installation of the pipeline, pump station and appurtenances. However, the program elements are not anticipated to increase the use of recreational facilities or deteriorate the existing preserve. No new recreational areas are proposed to be constructed as part of this project. Impacts, if any would be temporary in nature, related to construction and would be **less than significant**.

The Marin County Lover Novato Creek Restoration Projects 2-6 proposed to occur downstream of the SMART/Northwest Pacific Railroad Bridge to Highway 37 would involve a number of related wetland restoration activities including the enhancement of the Novato Creek corridor, reconfiguration of levees, along with restoration of tidal marshes for flood protection. Construction

activities associated with these elements would physically disrupt trails used be hikers and birders in the area. These potential impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measure 3.15.1.** Impacts to recreational resources resulting from NBWRP Phase 2 would be **less than significant with mitigation**.

Petaluma

Agricultural Recycled Water Expansion Phase 3. The extension of an additional 11,300 LF of pipeline would occur along Lakeville Road, a route which is also proposed for a Class II bikeway. Construction along this route would involve trenching and lane closures. At the conclusion of construction all surfaces, including bikeways, would be restored to their pre-project condition, as indicated in Section 2.10.1.5, Surface Restoration. **Mitigation Measure 3.15.1** would be implemented requiring Member Agencies to identify alternate routes to minimize impact to recreational trails during construction. These impacts would be temporary in nature and **less than significant with mitigation**.

Napa SD

The recycled water pipeline installed to connect the proposed storage tank located near Napa State Hospital to the existing recycled water main would include trenching activities and require the use of large equipment including some rock bracing secure an 1,800 LF hillside pipeline segment within or near Skyline Park's River to Ridge Trail. Construction would cross and include lands utilized for recreational purposes and could generate temporary impacts to recreational resources. These potential impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measure 3.15.1**, which would include detour routes to avoid these areas. At the conclusion of construction, all surfaces and trails would be restored to their pre-project conditions, as indicated in Section 2.10.1.5, *Surface Restoration*. Impacts would be **less than significant with mitigation**.

SCWA

Valley of the Moon ASR. The new facilities proposed for the Valley of the Moon ASR include construction of wells, 500 LF of pipeline and a pump station to utilize potable water during winter months to meet demand in summer months (aquifer recharge). This activity would not cause disruption or deterioration of any recreational facility in the area. Therefore, there would be **no impact**.

Sonoma ASR. The Sonoma ASR would include construction of wells, 1,700 LF of pipeline, and a pump station. Although these components would be constructed near facilities utilized for recreation including the Sonoma Bike Path, several baseball fields, and a park, construction of this Program Element would not cause disruption or deterioration of any recreational facility in the area. Therefore, there would be **no impact**.

City of American Canyon

Construction of the proposed recycled water distribution systems (RW5, RW6) along Jim Oswald Way, Mezzetta Court, Green Island Road, and Hannah Drive would include roadwork in an industrial area to serve industrial water users. The proposed recycled water distribution systems would not involve or include any recreational facilities, nor would the Program Elements increase the use of existing recreational resources such that physical deterioration would occur. There would be **no impact** under this criterion for these program elements.

Storage Alternative

In general, existing recreational areas would not be utilized for the development of additional facilities under the Storage Alternative. A discussion of impacts is provided in **Table 3.15-2** for each of the four Member Agency service areas follows.

Novato SD

The proposed additional Novato SD tertiary-level recycled water treatment capacity increases would occur within the existing facility, which is not utilized for recreational purposes. The construction associated with this Storage Alternative element is not expected to create effect recreational resources. Therefore, **no impact** would occur.

SVCSD

Seasonal Storage – Mulas Site. There are no recreational resources in the vicinity of this Storage Alternative element. There would be **no impacts** to recreational resources associated with this project.

Petaluma

Seasonal Storage. Construction two new seasonal storage ponds at a site southeast of the existing Ellis Creek WRF ponds. There are no recreational facilities (i.e., trails) in this portion of the WRF property. Therefore, there would be **no impact** to recreational facilities.

TABLE 3.15-2: STORAGE ALTERNATIVE EFFECTS TO RECREATIONAL RESOURCES

Proposed Action		Impact and Mitigation Measure by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	The proposed additional Novato SD tertiary-level recycled water treatment capacity increases would occur within the existing facility, which is not utilized for recreational purposes. Therefore, **no impact** would occur.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	The construction associated with this alternative is not expected to generate substantial ingress and egress to the facility, such that any impact to recreational resources would occur. **(No Impact)**
Napa SD MST Northern and Eastern Loop	Napa SD	This alternative project component would involve trenching and other roadwork which could temporarily impact roads in this region that are utilized for recreational bike riding. At the conclusion of construction, all roadways would be restored to their pre-project condition. Impacts if any would be **less than significant**.
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	The construction associated with this alternative is not expected to generate substantial ingress and egress to the facility, such that any impact to recreational resources would occur. **(No Impact)**
Petaluma – Ellis Creek WRF Southeast	Petaluma	There are no recreational facilities (i.e., trails) in this portion of the WRF property. Therefore, there would be **no impact.**
Napa SD Jameson Ranch	Napa SD	Construction vehicles would travel a local bike route, along North Kelly Road, to access the Jameson Ranch Site to facilitate storage pond construction. **Mitigation Measure 3.15-1** would require a detour of the bike route. Temporary disturbances to this bike route would be **less than significant with mitigation**.
SVCSD Seasonal Storage - Mulas	SVCSD	There would be **no impact** to recreational resources associated with this project.

Napa SD

Construction vehicles would travel along North Kelly Road, a local bike route, in order to access the Jameson Ranch Site to facilitate storage pond construction. Construction-related impacts to use of this recreational resource would be reduced to less than significant levels through the incorporation of **Mitigation Measure 3.15.1.** Therefore, the impact of this Storage Alternative element to recreational resources would be **less than significant with mitigation.**

The MST northern and eastern extension of recycled water distribution would include construction of 4.9 miles of pipelines primarily within existing roadways in Napa. This would involve trenching and other roadwork which could temporarily impact roads in this region that are utilized for recreational bike riding. At the conclusion of construction, all roadways would be restored to their pre-project condition, as indicated in Section 2.10.1.5, *Surface Restoration*. Also, these potential impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measure 3.15.1.** Therefore, impacts would be **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.15.1: The appropriate Member Agency shall coordinate with the appropriate local and regional agencies to identify detour routes for the bikeways and trails during construction where feasible, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.8.1**). In addition, the Member Agency shall conduct outreach to notify the public of closures, detours, etc.

Impact Significance after Mitigation: Less than Significant.

3.15.3.4 Impact Summary by Service Area

Appendix 3.15B provides a summary of potential Project impacts per Member Agency related to recreation.

3.16 Aesthetics

Aesthetic resources are generally defined as both natural and built features of the landscape that contribute to the public experience and appreciation of the environment. This section describes aesthetic and visual resources and considerations (including scenic vistas, scenic resources, visual character and quality, and existing light and glare) in the project area in Section 3.16.1, *Affected Environment*. Setting information and the Regulatory Framework that governs these resources and considerations is presented in Appendix 3.16A, *Regulatory Framework*. Section 3.16.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* can be found in Chapter 4.0. No comments or other input regarding aesthetics and visual resources were received during the scoping period for this EIR/EIS.

3.16.1 Affected Environment

A summary of aesthetic resources for each of the Member Agencies is provided in **Appendix 3.16A**.

3.16.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Aesthetics issues and used to determine the significance criteria presented in Section 3.16.3.1 is found in **Appendix 3.16A**.

3.16.3 Direct and Indirect Effects

3.16.3.1 Significance Criteria under CEQA

Based on Appendix G of the CEQA Guidelines, NBWRP Phase 2 or an alternative would have a significant impact on aesthetics resources if it would:

1. Have a substantial adverse effect on a scenic vista;
2. Substantially damage scenic resources, such as scenic highway corridors and scenic landscape units;
3. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area;
4. Substantially degrade the existing visual character of the site and its surroundings; or
5. Conflict with adopted environmental plans.

A description of the individual NBWRP Phase 2 components is provided in Chapter 2, Project Description, and is not repeated here. Impairment of existing aesthetic resources may result from the degradation of a visual feature that has aesthetic significance, or from the introduction of objects or patterns that exhibit a relatively high degree of visual contrast with the existing objects and patterns on the site. Physical changes that may impair the quality of important views include changes in scale, form, color and texture of natural features existing on the site. Such changes could result from new structures, grading and excavation, landscaping, or elimination of existing vegetation. Temporal aspects of visual disruption are also considered. For purposes of this analysis, construction of any NBWRP Phase 2 components which would occur in less than one year would not be considered a significant impact to visual resources.

3.16.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD with 1.8 miles of distribution pipelines, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 9.24 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.16.1: Temporary Impact to Scenic Vistas. NBWRP Phase 2 construction activities could temporarily affect scenic vistas in the NBWRP area. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** to scenic vistas related to short-term construction.

Under the No Action Alternative, projects would be constructed in areas that would have potential for construction-related impacts to scenic vistas. These projects – with the exception of Petaluma's Urban Recycled Water Expansion – would have a **less-than-significant impact** to scenic vistas as construction would be completed within one year. The Urban Recycled Water project was found to have **no impact** to scenic vistas due to the lack of such vantage points.

Proposed Action/Program Elements

Construction of the NBWRP Phase 2 components would cause temporary disruption of existing visual resources, including scenic vistas. However, these construction activities would partially occur at existing treatment facilities or within road rights-of-way, thereby reducing the likelihood for conflicts with scenic vistas during construction. Treatment upgrades within the treatment facilities would have little or no impact, because the existing visual character of the sites is already industrial and utilitarian. In most cases, the construction impacts for each component would be short-term and intermittent (i.e., less than one year); therefore, any disruption of scenic vistas would be considered less than significant. If necessary, measures to limit certain temporary construction impacts to scenic vistas would be implemented as mitigation. Although pipeline installation would progress along the local roadways, construction would only affect a specific location for a short period of time (i.e., less than one year). Staging areas associated with these projects could be used for a longer period of time. Impacts associated with the Proposed Action and Program Elements are identified in **Table 3.16-1**.

Storage Alternative

Table 3.16-2 identifies potential impacts for the Storage Alternative, Components of the Novato SD Storage Alternative projects would be constructed within one year or in sequential construction seasons, each lasting less than a year. It is anticipated that the pipeline serving the Seasonal Storage Project would be constructed in seven weeks. Likewise, the Napa SD MST loop projects would be constructed in one year if various components were constructed concurrently or over two construction seasons. Each of the seasonal storage projects would be constructed over multiple construction seasons. However, as required by San Francisco Bay Regional Board stormwater requirements, construction would cease over the rainy season (i.e., November through April), during which time any disturbed ground surface would be temporarily stabilized. Impact would be **less than significant**.

TABLE 3.16-1: PROPOSED ACTION SHORT TERM CONSTRUCTION RELATED EFFECTS TO SCENIC VISTAS

Proposed Action	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary construction-related impacts related to scenic vistas would be within the confines of existing WRFs. The visual characteristics of the WRFs (i.e., industrial) would not change when viewed from vista points. Therefore, impacts would be **less than significant**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD	
Pipeline Projects		
Marin County Lower Nov Creek	Marin Co.	Construction of pipelines would be located within existing roadways, and construction rates would be anticipated up to 200 feet per day. Construction for each of these projects is anticipated to be short-term and completed within one year. Therefore, construction-related impacts to scenic vistas would be **less than significant**.
SVCSD Napa Road Pipeline	SVCSD	
MMWD San Quentin Pipeline	MMWD	
Petaluma Ag Recycled Water	Petaluma	
Petaluma Urban Recycled Water	Petaluma	There are no scenic vistas in view of these projects. Therefore, there would be **no impact**.
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	Construction of this project is limited in size and is anticipated to be short-term, completed within one year. Therefore, construction-related impacts to scenic vistas would be **less than significant**.
Napa SD Soscol Covered Storage	Napa SD	This project would be in view of the Officer George Butler Bridge on Highway 12/29 over the Napa River, offering views of the river, salt ponds, marshlands, and San Pablo Bay. The bridge does not offer a stationary vista point. Construction of this project is anticipated to be short-term and completed within one year. Therefore, construction-related impacts to scenic vistas would be **less than significant**.

TABLE 3.16-1: PROJECT ELEMENTS SHORT TERM CONSTRUCTION RELATED EFFECTS TO SCENIC VISTAS (CONTINUED)

Program Elements	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	Construction of pipelines for each of these projects is anticipated to be short-term and completed within one year. Therefore, construction-related impacts to scenic vistas would be **less than significant**.
Napa SD Napa State Hospital Pipeline	Napa SD	
SCWA Potable Water ASR - Sonoma	SCWA	There are no scenic vistas in view of this project. Therefore, there would be **no impact**.
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Active construction activities would be limited to seven months per year to comply with Regional Board stormwater regulations. Pursuant to those regulations, construction activities for the project would cease in October and the ground surface at each site would be stabilized. Given the short-term of construction activities per construction season, the impact to scenic vistas would be **Less than Significant**.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	The tank site would be situated along Skyline Trail, which provides vista views over the City of Napa and the Napa River. Given the topography of the site and the trail's location relative to the site the tank would not block existing vista views. Therefore, the impact would be **less than significant**.
SCWA Potable Water ASR - Valley of the Moon	SCWA	This component would involve installation of pipelines from existing storage tanks located on a hilltop overlooking the Vallejo State Historic Site, the City of Sonoma, and points south. This tank site is not publicly accessible. The construction of the pipelines at the tank site would be visually obscured by the existing tanks. Therefore, construction-related impacts to scenic vistas would be **less than significant**.
SCWA Potable Water ASR - Sonoma	SCWA	The well site and pump station would not be in view of scenic vistas, nor does the site offer vista views. Therefore, there would be **no impact**.

TABLE 3.16-2: STORAGE ALTERNATIVE SHORT TERM CONSTRUCTION RELATED EFFECTS TO SCENIC VISTAS

Storage Alternative	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary construction-related impacts related to scenic vistas would be within the confines of existing WRFs. The visual characteristics of the WRFs (i.e., industrial) would not change when viewed from vista points. Therefore, there would be **no impact**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	Construction of pipelines for each of these projects is anticipated to be short-term and completed within one year. Therefore, construction-related impacts to scenic vistas would be **less than significant**.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Active construction activities would be limited to seven months per year to comply with Regional Board stormwater regulations. Pursuant to those regulations, construction activities for the project would cease in October and the ground surface at each site would be stabilized. Given the short-term of construction activities per construction season, the impact to scenic vistas would be **less than significant**.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Petaluma	
SVCSD Seasonal Storage - Mulas	SVCSD	Based on the level topography and the lack of publicly-access vantage points at or near the site, this Storage Alternative project would have **no impact** to scenic vistas.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.16.2: Impact to views along designated scenic roadways. Implementation of the NBWRP could affect views along eligible or designated Caltrans Scenic Highways or locally-defined scenic routes. (Less than Significant with Mitigation)

The NBWRP Phase 2 components would cause temporary disruption of existing visual resources along designated scenic roadways. Treatment upgrades within the treatment facilities would have no impact to aesthetics, because the existing visual character of the sites is already industrial and utilitarian. In most cases, the construction impacts for each component would be short-term and intermittent (i.e., less than one year); therefore, any visual disruption would be considered less than significant. If necessary, measures to limit certain temporary construction impacts to aesthetics would be implemented as mitigation. Although pipeline installation would progress along the local roadways, including a Caltrans-designated scenic highway, or a locally-defined scenic corridor identified in a local General Plan, construction would only affect a specific location for a short period of time (i.e., less than one year), which would be considered less than significant. Staging areas associated with these projects could be used for a longer period of time.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, all of these projects – with the exception of Marin County Lower Novato Creek Project 1 – would have **no impact** to designated scenic roadways, as there are none in the vicinity or the project would not be within view of the roadway. The impact of the Marin County Lower Novato Creek Project 1 was found to be **less than significant with mitigation** to ensure that any disturbed areas would be restored to pre-construction conditions.

Proposed Action

Novato SD. In the Novato SD service area, there are no Caltrans-designated scenic highways; however, portions of Highways 101 and 37 are eligible for designation. The City of Novato has also designated sections of Atherton Avenue as a locally-important scenic route (see **Table 3.16-3**).

The proposed Treatment Capacity Expansion at the RWF includes installation of filters and a chlorine tank. The existing treatment plant is visible from Highway 101. However, the location of these two components are within the confines of the treatment plant and construction impacts would be temporary. Therefore, there would be **no impact** to this scenic roadway.

The Lower Novato Creek Project 1 is the first part of 6 projects to create a more flood resilient and ecologically functioning Lower Novato Creek. Project would create habitat opportunities and new ecotone levees. Construction would be visible from Highway 101. However, these effects would be considered short-term, as construction of the 1.1-mile pipeline is expected to take up to three weeks (i.e., less than one year) and all pipelines would be buried in the ecotone levees. Implementation of **Mitigation Measure 3.16-2a** would ensure that the levees would be returned to their pre-construction condition. Therefore, this impact is considered **less than significant with mitigation**.

The Turnout to Wetlands in the Hamilton Wetlands would not be visible from Highway 37 due to distance and intervening development. Therefore, there would be **no impact** to this scenic roadway.

SVCSD. Napa Road is a county-designated scenic roadway. The Napa Road Pipeline Phase 2 component would consist of construction of 11,500 LF of 12-inch-diameter pipeline from 5th Street East to the east in Napa Road. Construction of the pipeline along Napa Road would disrupt the visual character of the immediate area during the approximately six-week construction period. However, these effects would be considered short-term, as construction would be completed in less than one year. Upon completion of construction, the roadway would be returned to its pre-construction condition, as required by **Mitigation Measure 3.16-2a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

MMWD. There are no Caltrans-eligible or designated, or locally-designated, scenic roadways within view of the Recycled Water Distribution System Expansion to San Quentin. Therefore, there would be **no impact** to this resource.

Napa SD. The Soscol WRF Increased Filter Capacity project includes installation of a filter on 500 square feet of area within the confines of the facility. Likewise, the construction of the 0.25-acre Covered Storage pond would disturb an undeveloped area within the bounds of the Soscol WRF adjacent to existing facilities. The Soscol WRF can be viewed from the Officer George Butler Bridge on Highway 12/29 to the north, which is designated by Napa County as a scenic roadway. However, NBWRP Phase 2 components would not be clearly visible from this roadway due to distance and the surrounding industrial setting. Therefore, there would be **a less-than-significant impact** to this scenic roadway.

Petaluma. Highway 116 and Lakeville Highway are county-designated scenic roadways within the Petaluma service area.

The proposed Ellis Creek WRF Increased Capacity NBWRP Phase 2 component includes installation of filters, pumps, and ultraviolet disinfection lamps within the developed portions of the facility. This would be consistent with the existing industrial character of the WRF and would not impinge upon views from Highway 116. Therefore, there would be **no impact** to a scenic roadway associated with this NBWRP Phase 2 component.

TABLE 3.16-3: PROPOSED ACTION EFFECTS TO SCENIC ROADWAYS

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	The active components of these projects are within the confines of the treatment facility and not in view from a designated scenic roadway. Therefore, there would be **no impact**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
CMSA WRF	MMWD	
Pipeline Projects		
Marin County Lower Nov Creek	Marin Co.	Construction would be visible from a designated roadway. While these effects would be considered short-term (i.e., less than one year) and all pipelines would be buried, implementation of **Mitigation Measure 3.16-2a** would ensure that disturbed areas would be returned to their pre-construction condition. Therefore, this impact is considered **less than significant with mitigation**.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
MMWD San Quentin Pipeline	MMWD	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
Petaluma Urban Recycled Water	Petaluma	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
Napa SD Soscol Covered Storage	Napa SD	The Soscol WRF can be viewed from the Officer George Butler Bridge on Highway 12/29 to the north, which is designated as a local scenic roadway. This component would not be clearly visible from this roadway due to distance and the surrounding industrial setting. Therefore, there would be **a less-than-significant impact** to designated scenic roadways.
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	Construction would be visible from a designated roadway. While these effects would be considered short-term (i.e., less than one year) and all pipelines would be buried, implementation of **Mitigation Measure 3.16-2a** would ensure that disturbed areas would be returned to their pre-construction condition. Therefore, this impact is considered **less than significant with mitigation**.
Napa SD Napa State Hospital Pipeline	Napa SD	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Active construction activities would be limited to seven months per year to comply with Regional Board stormwater regulations. Pursuant to those regulations, construction activities for the project would cease in October and the ground surface at each site would be stabilized. Likewise, the permanent plantings used for the restoration effort would also be in following with **Mitigation Measure 3.16-2a**. Therefore, the impacts to designated scenic roadways would be **less than significant with mitigation**.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
SCWA Potable Water ASR - Valley of the Moon	SCWA	
SCWA Potable Water ASR - Sonoma	SCWA	

There are no Caltrans or locally-designated scenic roadways in the areas comprising the Urban Recycled Water Expansion project. Therefore, there would be **no impact** to a scenic roadway associated with this NBWRP Phase 2 component.

The Agricultural Recycled Water Expansion would serve agricultural customers to the east and south of Petaluma. The project involves construction of 3.4 miles of pipeline in Highway 116 and Lakeville Highway. Construction of the pipeline along these designated roadways would disrupt views during the approximately two-month construction period. However, these effects would be considered short-term, as construction would be completed in less than one year and the roadway would be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-2a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

American Canyon. Highway 29 is classified by Caltrans and the Napa County General Plan as an eligible scenic highway.

Elements of both phases of the city's Recycled Water Distribution System Expansion includes the installation of pipelines in Highway 29 and roadways within sight of Highway 29. It is anticipated that 7,080 feet of pipeline would be installed in or along Highway 29 from Napa Junction Road to American Canyon Road. Smaller segments of pipeline would be installed in Tower Road, Lombard Road, Klamath Court and Dodd Court within view of Highway 29. Construction of the pipeline in or along Highway 29 would disrupt views during the approximately 10- to 12-week construction period. However, these effects would be considered short-term, as construction would be completed in less than one year. The same would be true for the shorter segments of pipeline, which would be constructed in a less time. These roadways would also be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-2a**. With implementation of this mitigation measure, this impact is considered less than significant with mitigation.

There are no Caltrans-eligible or designated, or locally-designated, scenic roadways within view of the NBWRP Phase 2 Treatment Plant Upgrades at the American Canyon WRF. Therefore, there would be **no impact** to designated scenic roadways.

Program Elements

The Program Elements components would construct an 18-acre recycled water storage pond with associated pump station and piping (Novato SD), implement five restoration projects in the Lower Novato Creek Basin (Novato SD), construct an additional 11,300 LF of recycled water distribution pipeline to serve agricultural customers (Petaluma), additional operational storage with associated pump station and 4,800 LF of piping (Napa SD), and two aquifer storage and recovery (ASR) projects near Sonoma including a combined 2,000 LF of pipeline (SCWA).

There are no designated scenic roadways in the vicinity of the Napa SD operational storage project or the two ASR projects near Sonoma. Therefore, there would be **no impact** this resource.

The remaining Program Elements components would be in view of Highway 37 and Atherton Avenue in Novato and Highway 116 and Lakeville Highway east and south of Petaluma, all of which are designated or eligible scenic roadways. It is anticipated that the construction of the pipelines would be accomplished within 12 months [per each project] and that disturbed areas would be restored as required by **Mitigation Measure 3.16.2a**. Likewise, the storage reservoir and associated pump station would be vegetated and designed to soften the visual effect from these designated roadways, per **Mitigation Measures 3.16.2b and 3.16.2c**. These impacts would be **less than significant with mitigation**.

The development and construction of the Lower Novato Creek Basin restoration projects would take more than a year. During construction, it is anticipated that construction would cease over the regulatory "rainy season" (i.e., November through mid-April) and any disturbed areas be appropriately prepared to prevent erosion, etc. This would be in following with **Mitigation Measure 3.16-2a**. Likewise, the permanent plantings used for the restoration effort would also be in following with **Mitigation Measure 3.16-2a**. Upon maturation of the restorative plantings, the visual quality of the basin, as viewed from the designated scenic roadways, would remain the same or be improved. Therefore, the impacts to designated scenic roadways relative to this Program Elements component would be **less than significant with mitigation**.

Storage Alternative

Table 3.16-4 identifies potential impacts for the Storage Alternative. The Seasonal Storage projects would be constructed within one year or in sequential construction seasons, each lasting less than a year. As required by San Francisco Bay Regional Board stormwater requirements, construction would cease over the rainy season (i.e., November through April), during which time any disturbed ground surface would be temporarily stabilized. Upon completion of construction, each of these projects would be restored to pre-construction conditions, as required in **Mitigation Measure 3.16-2a**. The other Storage Alternative components are either out of view from a designated scenic roadway or there are no such roadways in the vicinity.

Mitigation Measures

The appropriate Member Agency shall implement the following measures:

> **Mitigation Measure 3.16.2a:** Following construction activities, disturbed areas shall be restored to baseline conditions, by repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area.
>
> **Mitigation Measure 3.16.2b:** Berms around constructed reservoirs shall be vegetated with native seed mixes to soften the visual effect of the reservoirs from adjacent roadways.
>
> **Mitigation Measure 3.16.2c:** Design elements shall be incorporated to enhance visual integration of the pump stations and other above ground structures with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities.

Impact Significance after Mitigation: Less than significant.

TABLE 3.16-4: STORAGE ALTERNATIVE EFFECTS TO SCENIC ROADWAYS

Storage Alternative	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	The active components of these projects are within the confines of the treatment facility and not in view from a designated scenic roadway. Therefore, there would be **no impact**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	Active construction activities would be limited to seven months per year to comply with Regional Board stormwater regulations. Pursuant to those regulations, construction activities for the project would cease in October and the ground surface at each site would be stabilized. Likewise, the permanent plantings used for the restoration effort would also be in following with **Mitigation Measure 3.16-2a**. Therefore, the impacts to designated scenic roadways would be **less than significant with mitigation**.
Napa SD MST Northern and Eastern Loop	Napa SD	There are no designated scenic roadways in view of these projects. Therefore, there would be **no impact**.
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Active construction activities would be limited to seven months per year to comply with Regional Board stormwater regulations. Pursuant to those regulations, construction activities for the project would cease in October and the ground surface at each site would be stabilized. Likewise, the permanent plantings used for the restoration effort would also be in following with **Mitigation Measure 3.16-2a**. Therefore, the impacts to designated scenic roadways would be **less than significant with mitigation**.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Petaluma	
SVCSD Seasonal Storage - Mulas	SVCSD	The active components of this project would not be in view from a designated scenic roadway. Therefore, there would be **no impact**.

Impact 3.16.3: Source of Light or Glare. NBWRP components could introduce new sources of light and glare on the project sites. (Less than Significant with Mitigation)

The NBWRP Phase 2 components have the potential to cause temporary disruption of existing visual resources due to introducing new sources of light or glare. Exterior lighting would be installed around the constructed water storage reservoirs, distribution pump stations, and storage tanks. Exterior lighting could adversely affect nighttime views by introducing a new source of light and glare. The lighting would be used for security purposes only and would be timed, manually operated, or equipped with motion sensors. If nighttime construction is required, lighting at construction sites would contribute to ambient light. Also, building materials for new facilities could be reflective and contribute to additional glare from constructed facilities. Implementation of the identified mitigation measures would reduce potentially significant lighting and glare impacts to a less-than-significant level.

There would be no long-term lighting installed for the pipelines, therefore is not discussed further.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, these projects would not require lighting for construction or operation/maintenance. Therefore, would have **no impact** relative to light or glare.

Proposed Action

Novato SD. Table 3.16-5 identified potential impacts related to the Proposed Action. Under NBWRP Phase 2, expansion of tertiary Treatment Capacity Expansion at the Novato SD RWF would not result in impacts from lighting and glare because the existing WWTP site (which includes the RWF) currently uses emergency and operational lighting for existing facilities. Modification of the existing plant may involve additional lights and the net effect is anticipated to be negligible. Therefore, this impact would be **less than significant**.

The Lower Novato Creek Project 1 would only include distribution pipelines which would not require lighting. Likewise, the Turnout to Wetlands project would not include elements requiring lighting. There are also no receptors within a distance to be affected by light trespass. Therefore, **no impact** is expected.

SVCSD. The Napa Road Pipeline Phase 2 component would consist solely of a pipeline and would not require permanent lighting. Therefore, **no impact** is expected.

TABLE 3.16-5: PROPOSED ACTION EFFECTS FROM LIGHTING AND GLARE

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	The active components of these projects are within the confines of the treatment facility (WWTP), which has existing operational and emergency lighting. Any additional lighting or glare resulting from the project would be negligible; therefore, the impact would be **less than significant**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD	
Pipeline Projects		
Marin County Lower Nov Creek	Marin Co.	These projects would only include distribution pipelines which would not require lighting. Therefore, **no impact** is expected.
SVCSD Napa Road Pipeline	SVCSD	
Petaluma Ag Recycled Water	Petaluma	
MMWD San Quentin Pipeline	MMWD	
Petaluma Urban Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	This project would not include elements requiring lighting. There are also no receptors within a distance to be affected by light trespass. Therefore, **no impact** is expected.
Napa SD Soscol Covered Storage	Napa SD	This project would introduce lighting to an undeveloped area of the Soscol WRF. Therefore, **Mitigation Measures 3.16.3a and 3.16.3b** are proposed to ensure that light trespass and glare are controlled. Therefore, this impact would be **less than significant with mitigation**.
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	These projects would only include distribution pipelines which would not require lighting. Therefore, **no impact** is expected.
Napa SD Napa State Hospital Pipeline	Napa SD	
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	These projects would not include facilities that require lighting. Therefore, **no impact** is expected.
Novato SD Seasonal Storage	Novato SD	These projects would introduce new sources of operational and/or emergency lighting, such as storage tanks, pump stations, or well facilities. Therefore, **Mitigation Measures 3.16.3a and 3.16.3b** are proposed to ensure that light trespass and glare are controlled. Therefore, this impact would be **less than significant with mitigation**.
Napa SD State Hospital Storage Tank	Napa SD	
SCWA Potable Water ASR - Valley of the Moon	SCWA	
SCWA Potable Water ASR - Sonoma	SCWA	

MMWD. The proposed San Quentin delivery project includes one pump station, a 0.08 MG storage tank, and microfiltration treatment. These elements would be located within the confines of the CMSA treatment facility, which has existing operational and emergency lighting. While each may be equipped with lighting, the net effect is anticipated to be negligible. Therefore, this impact would be **less than significant**.

Napa SD. Under NBWRP Phase 2, the Soscol WRF Increased Filter Capacity Phase 2 component would not result in significant impacts from lighting and glare because the facility currently uses emergency and operational lighting for existing facilities. Modification of the existing plant would involve additional lights and the net effect is anticipated to be negligible. Therefore, this impact would be **less than significant**.

The construction of the 0.25-acre operational storage pond would introduce lighting to an undeveloped area of the Soscol WRF. Although this component would be within the bounds of the treatment facility, it would be away from the core of the facility where lighting is currently in use. The introduction of a new light source in this area would be considered a potentially significant impact. Therefore, **Mitigation Measures 3.16.3a and 3.16.3b** are proposed to ensure that light trespass and glare are controlled. Therefore, this impact would be **less than significant with mitigation**.

Petaluma. Expansion of tertiary treatment and Ellis Creek WRF Increased Capacity would not result in impacts from lighting and glare to aesthetics because the Ellis Creek WRF currently uses emergency and operational lighting for existing facilities. Modification of the existing plant would involve additional lights and the net effect is anticipated to be negligible. Therefore, this impact would be **less than significant**.

The Urban and Agricultural Recycled Water Expansion Phase 2 components include only recycled water distribution pipelines. There would be no exterior lighting associated with the proposed distribution pipelines; therefore, **no impact** is expected.

American Canyon. Both phases of American Canyon's Recycled Water Distribution System Expansion would include only recycled water distribution pipelines. There would be no exterior lighting associated with the proposed distribution pipelines; therefore, **no impact** is expected.

The proposed American Canyon WRF Phase 2 Treatment Plant Upgrades include installation of one two-stage RO system, modifications to ponds, addition of a concentrate disposal system, pipelines connecting these components within the confined of the developed portions of the facility. These elements would be located within the confines of the treatment facility, which has existing operational and emergency lighting. While each may be equipped with lighting, the net effect is anticipated to be negligible. Therefore, this impact would be **less than significant**.

Program Elements

The Program Elements components would construct an 18-acre recycled water storage pond with associated pump station and piping (Novato SD), implement five restoration projects in the Lower Novato Creek Basin (Novato SD), construct an additional 11,300 LF of recycled water distribution pipeline to serve agricultural customers (Petaluma), additional operational storage with associated pump station and 4,800 LF of piping (Napa SD), and two aquifer storage and recovery (ASR) projects near Sonoma including pipeline and a pump station (SCWA).

As noted in this analysis, the pipeline projects are not anticipated to require lighting. Likewise, the Lower Novato Creek Basin restoration projects would not require lighting as they would not include structures, etc., which would require lighting. Therefore, there would be **no impact** relative to lighting attributable to NBWRP Phase 2.

The remaining Program Elements components would involve pumps stations, which would require emergency and operational lighting. The introduction of a new light source in the areas would be considered a potentially significant impact. Therefore, **Mitigation Measures 3.16.3a, 3.16.3b, and 3.16.3c** are proposed to ensure that light trespass and glare are controlled. Therefore, this impact would be **less than significant with mitigation**.

Storage Alternative

Table 3.16-6 identified potential impacts for the Storage Alternative. In general, the Storage Alternative components would not include the need for lighting, or if lighting were needed, it would not contribute to the existing ambient lighting or glare at the site.

TABLE 3.16-6: STORAGE ALTERNATIVE EFFECTS FROM LIGHTING AND GLARE

Storage Alternative	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	The active components of these projects are within the confines of the treatment facility, which has existing operational and emergency lighting. Any additional lighting or glare resulting from the project would be negligible; therefore, the impact would be **less than significant**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	These projects would include distribution pipelines which would not require lighting. Therefore, **no impact** is expected.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	These projects would not include facilities that require lighting. Therefore, **no impact** is expected.
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Petaluma	
SVCSD Seasonal Storage - Mulas	SVCSD	

Mitigation Measures

The appropriate Member Agency shall implement the following measures:

Mitigation Measure 3.16.3a: The exterior lighting installed around the operational and capacity storage reservoirs, distribution pump station, storage tanks, and booster pump station shall be of a minimum standard required to ensure safe visibility. Lighting also shall be shielded and directed downward to minimize impacts of light and glare.

Mitigation Measure 3.16.3b: All exterior lighting shall be directed downward and oriented to ensure that limited light source is directly visible from neighboring residential areas. If necessary, landscaping would be provided around proposed facilities. The vegetation would be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas.

Mitigation Measure 3.16.3c: Dark colored, non-reflective building materials should be used for project components that cause potentially significant impact from glare to visual resources.

Impact Significance after Mitigation: Less than significant.

Impact 3.16.4: Long-term impact to aesthetic character. Development of the proposed facilities, particularly pump stations and storage reservoirs, would permanently alter the aesthetic character of the project area. (Less than Significant with Mitigation)

The NBWRP Phase 2 components would cause temporary disruption or a permanent change in the character or quality of existing visual resources. Construction of facilities on graded or undeveloped areas would change the landscape by changing a site's visual character and quality by introducing physical elements that would change the visual context and create contrast. Facilities that would be constructed above-grade include pump stations and new storage reservoirs. These construction activities would partially occur at existing treatment facilities or within road rights-of-way, thereby reducing the likelihood for conflicts with visual resources during construction. Treatment upgrades within the treatment facilities would have no impact to aesthetics, because the existing visual character of the sites is already industrial and utilitarian. In most cases, the construction impacts for each component would be short-term and intermittent (i.e., less than one year); therefore, any disruption of visual character or quality would be considered less than significant. Also, in some cases, the pump stations and reservoirs would be located near sensitive receptors or roadways, however views may be buffered by street trees, minimized by property setbacks, or limited by topography. Furthermore, measures to limit certain temporary construction impacts to visual character and quality would be implemented as mitigation. Potential impacts are identified in **Table 3.16-7** and discussed below.

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, all of the projects – with the exception of Turnout to Wetlands project – would have a potentially significant impact to scenic character and quality, if not mitigated. Upon completion of construction, each of these projects would be restored to pre-construction conditions, as required in **Mitigation Measures 3.16-4a**, **3.16-4b**, and/or **3.16-4c** reducing any long-term impacts to **less than significant with mitigation**. The impacts of the Turnout to Wetlands project would be **less than significant**, as it would have a small footprint and would be distant from any publicly-accessible vantage points.

Proposed Action

Novato SD. The proposed Treatment Capacity Expansion includes installation of filters and a chlorine tank within the confines of the RWF. This would be consistent with the existing industrial visual character of the RWF facility. The construction or installation of this equipment would create temporary visual intrusion. Nonetheless, the construction process would not be out of character with the industrial nature of the facility. Upon completion of construction, the visual character of the site would not be changed. Therefore, this NBWRP Phase 2 component would have **no impact** to the visual quality of the RWF.

The Lower Novato Creek Project 1 would install approximately 1.1 miles of distribution pipelines to irrigate ecotone levees. Visible components of pipeline construction would include trenching, stockpiling, pipe laying, backfilling and surface restoration. It is anticipated that this would require approximately two months. The Turnout to Wetlands Phase 2 component in the Hamilton Wetlands would utilize the existing buried outfall pipe to divert flow to a short segment of underground pipe; only the turning mechanism would be above ground surface. After construction, the pipelines would be buried. To ensure that the visual remnants of construction would not permanently degrade the visual character or quality of these marsh areas, **Mitigation Measure 3.16.4a** would be implemented to require the restoration of the construction areas. Therefore, impacts to aesthetic resources due to the construction and operation of the recycled water pipelines would be **less than significant**.

SVCSD. The Napa Road Pipeline Phase 2 component would consist of construction of 11,500 LF of pipeline in the roadway. All pipelines would be buried except for those potentially suspended beneath bridge crossings. Visible components of pipeline

construction would include trenching, stockpiling, pipe laying, backfilling and surface restoration. It is anticipated that this would require approximately six weeks. Construction of the pipeline along Napa Road would disrupt the visual character of the immediate area during the approximately six-week construction period. However, these effects would be considered short-term, as construction would be completed in less than one year. Upon completion of construction, the roadway and other affected areas would be returned to its pre-construction condition, as required by **Mitigation Measure 3.16-4a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

MMWD. The San Quentin Prison Recycled Water Distribution System includes additional treatment of effluent at the CMSA treatment facility, then conveying the tertiary-treated recycled water through a pipeline in Sir Francis Drake Boulevard to San Quentin State Prison for use on the prison site. Given the industrial appearance of both sites, the visual quality is considered low when viewed from adjacent vantage points.

New components at CMSA would include the 50-horsepower pump station and 0.08 MG storage tank. Both of these would be constructed within the confines of the CMSA treatment facility. On-site components at the prison site would include adding dual plumbing, augmenting water to existing boilers, and irrigation. Improvements at the CMSA would minimally alter the existing appearance of the site, but the general visual character of the plant would remain unchanged. The improvements at San Quentin Prison would not alter the existing appearance of the prison, with the general visual character of the prison remaining the same. Therefore, these elements would have no impact to visual resources.

The conveyance pipeline component would consist of construction of 1.1 mile of pipeline in the roadway. All pipelines would be buried. Visible components of pipeline construction would include trenching, stockpiling, pipe laying, backfilling and surface restoration. It is anticipated that this would require approximately two months. Construction of the pipeline along Sir Francis Drake Boulevard and the Levee Road on the San Quentin site would disrupt the visual character of the immediate area during the construction period. However, these effects would be considered short-term, as construction would be completed in less than one year. Upon completion of construction, the roadway and other affected areas would be returned to its pre-construction condition, as required by **Mitigation Measure 3.16-4a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

Napa SD. The Soscol WRF Increased Filter Capacity project would include upgrades at the existing facility and installation of a filter. This project would utilize existing facilities to increase recycled water supply. This would be consistent with the existing industrial visual character of the facility. The construction or installation of this equipment would create temporary visual intrusion. Nonetheless, the construction process would not be out of character with the industrial nature of the facility. Upon completion of construction, the visual character of the site would not be changed. Therefore, this NBWRP Phase 2 component would have **no impact** to the visual quality of the Soscol WRF.

The 0.25-acre operational storage pond would disturb an undeveloped area adjacent to similar facilities within the confines of the Soscol WRF. This would alter the visual character of the Soscol WRF by adding additional visually hard surface. This site would be visible from Officer George Butler Bridge on Highway 12/29 to the north. Construction activities associated with the pond would be visible and include grading and installation of the cover. However, this new covered storage pond would be generally consistent with the existing visual character of the site and implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c** would minimize the aesthetic effects of this new facility and reduce the visual contrast of this new element to a **less-than-significant** level.

Petaluma. The proposed Filter Capacity expansion includes installation of filters and associated on-site piping and equipment within the confines of the Ellis Creek WRF. This would be consistent with the existing industrial visual character of the facility. The construction or installation of this equipment would create temporary visual intrusion. Nonetheless, the construction process would not be out of character with the industrial nature of the facility. Upon completion of construction, the visual character of the site would not be changed. Therefore, this NBWRP Phase 2 component would have **no impact** to the visual quality of the Ellis Creek WRF.

The Urban Recycled Water Expansion project includes approximately 8.0 miles of recycled water pipelines to be installed in city streets, except for pipelines potentially suspended beneath bridge crossings. The Agricultural Recycled Water Expansion involves construction of 3.4 miles of pipeline in Highway 116 and Lakeville Highway to the east of the city. Construction of the pipeline along these roadways would disrupt the area's visual character during the construction period. However, these effects would be considered short-term, as construction of any of the elements would be completed in less than one year and affected roadways and other affected areas would be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-4a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

City of American Canyon. Construction of the combined 4.5 miles of pipelines comprising American Canyon's Recycled Water Distribution System Expansion would occur entirely along existing roadways within developed portions of the city. Construction of the pipeline along these roadways would disrupt the area's visual character during the construction period. However, these effects would be considered short-term, as construction of any of the elements would be completed in less than one year and affected roadways and other affected areas would be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-4a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

TABLE 3.16-7: PROPOSED ACTION LONG-TERM EFFECTS TO SCENIC CHARACTER AND QUALITY

	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
PROPOSED ACTION		
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary construction-related activities would be within the confines of existing WRFs. The visual character and quality of the WRFs (i.e., industrial) would not change. Therefore, there would be **no impact**.
Napa SD Soscol WRF	Napa SD	
Petaluma Ellis Creek WRF	Petaluma	
American Canyon WRF	American Canyon	
CMSA WRF	MMWD	
Pipeline Projects		
Marin County Lower Nov Creek	Marin Co.	All pipelines would be buried, except for those suspended beneath bridges at stream or roadway crossings. After construction, the permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measure 3.16.4a**. Therefore, the long-term impact to visual character or quality would be **less than significant with mitigation**.
SVCSD Napa Road Pipeline	SVCSD	
MMWD San Quentin Pipeline	MMWD	
Petaluma Ag Recycled Water	Petaluma	
Petaluma Urban Recycled Water	Petaluma	
American Canyon Recycled Water	American Canyon	
Storage or Other Projects		
Novato SD BMK Turnout	Novato SD	All of the project elements would be buried, except for those needed to divert water from the outflow to the wetlands. Being in the central portion of the BMK restoration area, there are no permanent vantage points in view of this site. Therefore, there would be no long-term impact to visual character or quality.
Napa SD Soscol Covered Storage	Napa SD	The operational storage pond would alter the visual character of the Soscol WRF by adding additional visually hard surface. This site would be visible from Officer George Butler Bridge on Highway 12/29 to the north. The permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality program elements components would be **less than significant with mitigation.**
PROGRAM ELEMENTS		
Pipeline Projects		
City of Petaluma Ag Phase 3	Petaluma	All pipelines would be buried, except for those suspended beneath bridges are stream or roadway crossings. After construction, the permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measure 3.16.4a**. Therefore, the long-term impact to visual character or quality would be less than significant with mitigation.
Napa SD Napa State Hospital Pipeline	Napa SD	
SCWA Potable Water ASR - Sonoma	SCWA	
Storage or Other Projects		
Novato SD Lower Novato Creek Projects 2 through 6.	Novato SD	Given the location and nature of the Novato SD Program Elements components, the permanent changes to the area's visual character relative to the current appearance of the Lower Novato Creek Basin and lowlands east of Deer Island would be altered. The permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality program elements components would be **less than significant with mitigation**.
Novato SD Seasonal Storage	Novato SD	
Napa SD State Hospital Storage Tank	Napa SD	Napa SD's additional operational storage project is located within the confines of, and adjacent to, the Napa State Hospital. The tank site would be situated on a hill traversed by Skyline Trail, which provides views to the west across the City of Napa and the lower reaches of the Napa River. The permanent change in visual character and quality would be lessened with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality of the area would be **less than significant with mitigation**.
SCWA Potable Water ASR - Valley of the Moon	SCWA	Above ground elements of these projects would be located in currently developed areas. Upon completion of the projects, the areas of disturbance would be restored and any above ground elements as required in **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, impacts to visual character and quality relative to these program elements components would be **less than significant with mitigation.**
SCWA Potable Water ASR - Sonoma	SCWA	

The proposed Phase 2 Treatment Plant Upgrades include the construction of a two-stage RO system and modifications to ponds for concentrate disposal within the confines of the American Canyon WRF. This would be consistent with the existing industrial visual character of the facility. The construction or installation of this equipment would create temporary visual intrusion. Nonetheless, the construction process would not be out of character with the industrial nature of the facility. Upon completion of construction, the visual character of the site would not be changed. Therefore, this NBWRP Phase 2 component would have **no impact** to the visual quality of the American Canyon WRF.

Program Elements

The Program Elements components would construct an 18-acre recycled water storage pond with associated pump station and piping (Novato SD), implement five restoration projects in the Lower Novato Creek Basin (Novato SD), construct an additional 11,300 LF of recycled water distribution pipeline to serve agricultural customers (Petaluma), additional operational storage with associated pump station and 4,800 LF of piping (Napa SD), and two aquifer storage and recovery (ASR) projects near Sonoma including a combined 2,000 LF of pipeline (SCWA).

Given the location and nature of the Novato SD Program Elements components, the permanent changes to the area's visual character relative to the current appearance of the Lower Novato Creek Basin and lowlands east of Deer Island. Construction of the project elements – berms, ecotone levees, levee removal, etc. – would be a temporary, but significant, impact given the large areas of disturbance. It is anticipated that the construction of any one component would be completed within one year. The permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality of the Novato area relative to these Program Elements components would be **less than significant with mitigation**.

The third phase of Petaluma's Agricultural Recycled Water Expansion involves construction of 2.1 miles of pipeline in Lakeville Highway to the east and south of the city. Construction of the pipeline would disrupt the area's visual character during the construction period. However, these effects would be considered short-term, as construction of any of the elements would be completed in less than one year and Lakeville Highway and other affected areas would be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-4a**. With implementation of this mitigation measure, this impact is considered **less than significant with mitigation**.

Napa SD's additional operational storage project is located within the confines of, and adjacent to, the Napa State Hospital. The tank site would be situated on a hill traversed by Skyline Trail, which provides views to the west across the City of Napa and the lower reaches of the Napa River. While the visual character of this site is high, there is another existing storage tank nearby which introduces elements of development to the setting. The construction of the tank and associated piping would be visible to trail users, but it is assumed that this would occur in less than one year. The permanent change in visual character and quality would be lessened with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality of the Novato area relative to these Program Elements components would be **less than significant with mitigation**.

The Valley of the Moon ASR Program Elements component would be located in a developed area of El Verano. The visual character of the area is that of neighborhood residential and commercial development. Construction of the project elements would disrupt the area's visual character during the construction period. However, these effects would be considered short-term, as construction of any of the elements would be completed in less than one year and the affected areas would be returned to pre-construction conditions, as required by **Mitigation Measure 3.16-4a**. Additionally, any above ground structures would be required to adhere to **Mitigation Measure 3.16-4b to** minimize the visual contrast created by these elements. With implementation of these mitigation measures, this impact is considered **less than significant with mitigation**.

The Sonoma ASR component would involve installation of pipelines from existing tanks located on a hilltop overlooking the Vallejo State Historic Site, the City of Sonoma, and points south. This tank site is not publicly accessible. While it is visible from surrounding areas, the visual character of the site is dominated by existing storage tanks. Construction of the ASR components at the tank site (i.e., pipelines) would be visually obscured by the existing tanks. Upon completion, the areas of disturbance would be restored and any above ground elements as required in **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, impacts to visual character and quality relative to this Program Elements component would be **less than significant**.

Storage Alternative

Table 3.16-8 identified potential impacts for the Storage Alternative. Upon completion of construction, each of these projects would be restored to pre-construction conditions, as required in **Mitigation Measures 3.16-4a**, **3.16-4b**, and **3.16-4c** reducing any long-term impacts to **less than significant with mitigation**.

TABLE 3.16-8: STORAGE ALTERNATIVE EFFECTS TO VISUAL CHARACTER AND QUALITY

Storage Alternative	Member Agency	Impact and Mitigation Measure (if needed) by Member Agency
Treatment Upgrades		
Novato SD RWF	Novato SD	Temporary construction-related activities would be within the confines of existing WWTP (including the RWF). The visual character and quality of the WWTP (i.e., industrial) would not change. Therefore, there would be **no impact**.
Pipeline Projects		
Novato SD Seasonal Storage	Novato SD	All pipelines would be buried, except for those suspended beneath bridges are stream or roadway crossings. After construction, the permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measure 3.16.4a**. Therefore, the long-term impact to visual character or quality would be less than significant with mitigation.
Napa SD MST Northern and Eastern Loop	Napa SD	
Seasonal Storage		
Novato SD Seasonal Storage	Novato SD	Given the location and nature of these Storage Alternative elements, the permanent changes to the area's visual character relative to the current appearance of these areas would be altered. The permanent change in visual character would be consistent with the existing conditions with the implementation of **Mitigation Measures 3.16.4a, 3.16-4b, and 3.16.4c**. Therefore, the impacts to the scenic character and quality program Elements components would be **less than significant with mitigation.**
Petaluma – Ellis Creek WRF Southeast	Petaluma	
Napa SD Jameson Ranch	Petaluma	
SVCSD Seasonal Storage - Mulas	SVCSD	

Mitigation Measures

The appropriate Member Agency will implement the following measures:

Mitigation Measure 3.16.4a: Following construction activities, disturbed areas shall be restored to baseline conditions, by repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area.

Mitigation Measure 3.16.4b: Design elements shall be incorporated to enhance visual integration of the pump stations or other project-related above ground structures with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities.

Mitigation Measure 3.16.4c: After construction of any facility that is above grade and visible to sensitive receptors, visual screening and vegetation measures will be implemented to reduce impacts to scenic views. Trees or other suitable vegetation along the fenceline of the facility should be incorporated to reduce the industrial appearance of the structures. Similarly, berms for new storage ponds or pond reconfiguration will be re-vegetated to reduce the barren appearance of the berms.

Impact Significance after Mitigation: Less than significant

3.16.3.3 Impact Summary by Service Area

Appendix 3.16B provides a summary of potential Project impacts per Member Agency related to aesthetics.

3.17 Energy Conservation

This analysis is found in **Appendix 3.17A**. It describes energy supply, demand, and conservation-related considerations in Section 3.17.1, *Affected Environment*. The regulatory framework that governs these considerations is presented in Section 3.17.2, *Regulatory Framework*. Section 3.17.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. The Impact Summary table is included in Appendix 3.17B. No comments or other input were received during the scoping period for this EIR/EIS regarding energy conservation.

3.18 Environmental Justice

This section identifies minority and low-income populations that exist in the project area in Section 3.18.1, *Affected Environment*. The regulatory framework that governs environmental justice considerations is presented in Appendix 3.18A, *Regulatory Framework*. Section 3.18.3, *Direct and Indirect Effects*, describes the process of identifying "disproportionately high and adverse environmental effects" in the environmental justice context, analyzes whether the potential environmental impacts of each alternative would be disproportionately high and adverse on minority and low-income populations, and summarizes such effects by service area. The *Cumulative Impacts* are analyzed in Chapter 4.0. The Impact Summary table is included in Appendix 3.18B. No comments or other input were received during the scoping period for this EIR/EIS regarding environmental justice.

3.18.1 Affected Environment

According to the Federal Council of Environmental Quality (CEQ) guidelines for environmental justice analyses, "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent; or (b) the minority population percentage of the affected area is meaningfully greater than the majority population percentage in the general population or other appropriate unit of geographic analysis. … A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ, 1997).

This analysis uses two methods for identifying communities of concern related to income levels, based on two sets of guidelines: CEQ guidance and California Integrated Regional Water Management Guidelines. Both of these methods are addressed below.

The CEQ environmental justice guidance states that "…low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty" (CEQ, 1997, p. 25). USEPA guidance (1998) recommends the use of Census data on poverty income as one indicator, as well as other available data. Unlike the CEQ guidance on minority populations, none of the environmental justice guidance documents contain a quantitative definition of what proportion of low-income individuals defines a low-income population. The annual statistical poverty thresholds are based on family income. A threshold of 50 percent of individuals in families with incomes below the poverty threshold (similar to the 50 percent threshold used to identify a minority population) would be an overly restrictive threshold for identifying a low-income population due to the nature of the poverty thresholds, which are not adjusted for regional costs of living, and are below levels commonly considered low-income in many areas of California.[1]

For the purposes of this environmental justice analysis, the method of identifying low-income populations within the study area must account for regional costs of living. Therefore, this analysis uses a comparative approach and identifies a low-income population if the proportion of people with family incomes below the poverty threshold is meaningfully greater than that within the general population; in other words, if the percentage of such people in any of the communities considered is 1.5 times (or more) than that of the general population.

Additionally, this analysis uses California's Integrated Regional Water Management (IRWM)[2] Guidelines, which provide criteria for identifying "disadvantaged communities" during water resources planning efforts (DWR, 2016). The IRWM guidelines used the definition of a disadvantaged community as set forth in California Water Code § 79505.5(a). This section of the California Water Code defines disadvantaged communities as those communities with an annual median household income less than 80 percent of the statewide annual median household income, which was estimated at $61,818 in the 2011-2015 American Community Survey (DWR, 2016; U.S. Census Bureau, 2016a). The 80 percent threshold would be a median household income of $49,454, which is rounded to $49,000 for this analysis.

Information on racial and ethnic origin, household incomes, and poverty status was obtained from the 2011-2015 American Community Survey, provided by the U.S. Census Bureau, to identify environmental justice populations.

3.18.1.1 Novato SD and MMWD

Table 3.18-1 provides race- and origin-related demographic estimates for the cities of Novato and San Rafael and Marin County from the 2011-2015 American Community Survey. The populations of these cities and the county are majority white, with approximately 2 to 3 percent Black or African American residents, about 6 to 7 percent Asian residents, and 12 to 21 percent identifying as a race not listed in the survey (i.e., some other race), or two or more races. About 29 percent of San Rafael's population identify as Hispanic or Latino, which is nearly double that of the County as a whole, while Novato's Hispanic or Latino population is approximately 19 percent, several percentage points higher than that of the County.

[1] Poverty thresholds vary according to a family's size and composition. In 2015, the weighted average federal poverty threshold was $12,082 for one person and $18,871 for a three-person family. The range of thresholds used in poverty estimations in the 2011-2015 ACS can be found in reference document U.S. Census Bureau 2015a (U.S. Census Bureau, 2015a; US Census Bureau 2015b).

[2] Integrated Regional Water Management is a collaborative effort to manage all aspects of water resources in a region. Integrated Regional Water Management crosses jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.

TABLE 3.18-1: RACE AND ORIGIN: CITIES OF NOVATO AND SAN RAFAEL AND MARIN COUNTY, 2011-2015

	City of Novato		City of San Rafael		Marin County	
	Number	Percent of Total Population	Number	Percent of Total Population	Number	Percent of Total Population
Total Population	54,133	--	58,819	--	258,349	--
Race						
White	42,581	78.7	40,142	68.2	204,918	79.3
Black or African American	1,035	1.9	1,848	3.1	6,583	2.5
American Indian or Alaska Native	78	0.1	267	0.5	795	0.3
Asian	3,165	5.8	4,086	6.9	14,681	5.7
Native Hawaiian or other Pacific Islander	18	0.0	118	0.2	622	0.2
Some other Race	4,804	8.9	9,967	16.9	19,813	7.7
Two or more Races	2,452	4.5	2,391	4.1	10,937	4.2
Hispanic or Latino (of any race)						
Hispanic or Latino	10,454	19.3	16,897	28.7	40,875	15.8
Not Hispanic or Latino	43,679	80.7	41,922	71.3	217,474	84.2
Total Minority Population						
White alone, not of Hispanic or Latino origin	37,061	68.5	33,768	57.4	185,975	72.0
Minority (non-white and/or Hispanic or Latino)	17,072	31.5	25,051	42.6	72,374	28.0

SOURCE: U.S. Census Bureau, 2016a

The total minority population, defined as all residents other than those identifying as non-Hispanic white, is 28 percent for Marin County and about 43 and 32 percent for San Rafael and Novato, respectively.

Table 3.18-2 presents estimates of household income and poverty status for Novato, San Rafael, and Marin County from the 2011-2015 American Community Survey. Median household income is about 17 percent lower in the cities of Novato and San Rafael than in Marin County as a whole. While Novato and Marin County have similar percentages of individuals with family income below the poverty threshold (7.7 percent and 8.3 percent, respectively), San Rafael has a notably higher 13.2 percent.

TABLE 3.18-2: INCOME AND POVERTY STATUS: CITIES OF NOVATO AND SAN RAFAEL AND MARIN COUNTY, 2011-2015

	City of Novato	City of San Rafael	Marin County
Median Household Income	$78,439	$77,294	$93,257
Individuals with Family Income Below Poverty Threshold[a]	7.7%	13.2%	8.3%

NOTE:

[a] Poverty thresholds for individuals are calculated by the U.S Census Bureau based on a range of incomes and thresholds appropriate for an individual's family size and composition. Therefore, ACS estimations do not use one threshold, but a range of thresholds which are appropriate for various family sizes. Please refer to reference document US Census Bureau 2015a for the range of thresholds used in the ACS 2011-2015 (US Census Bureau 2015a; US Census Bureau 2015b.

SOURCE: U.S. Census Bureau, 2016b

3.18.1.2 SVCSD, SCWA, and City of Petaluma

Table 3.18-3 provides race- and origin-related demographic estimates for the Cities of Sonoma and Petaluma, and Sonoma County from the 2011-2015 American Community Survey. All have a majority white population, with less than 2 percent Black or African American residents, about 3 to 5 percent Asian residents, and 9 to 16 percent identifying as a race not listed in the survey (i.e., some other race), or two or more races. About 15 percent of the population in the City of Sonoma identifies as Hispanic or Latino, which is lower than the Sonoma County's 26 percent or Petaluma's 22 percent of residents identifying as Hispanic or Latino.

The total minority population, defined as all residents other than those identifying as non-Hispanic white, is 35 percent for Sonoma County and about 20 percent for the City of Sonoma and 32 percent for the City of Petaluma.

TABLE 3.18-3: RACE AND ORIGIN: CITIES OF SONOMA AND PETALUMA AND SONOMA COUNTY, 2011-2015

	City of Sonoma		City of Petaluma		Sonoma County	
	Number	Percent of Total Population	Number	Percent of Total Population	Number	Percent of Total Population
Total Population	10,897	--	59,340		495,078	--
Race						
White	9,575	87.9	46,816	78.9	382,484	77.3
Black or African American	9	0.1	515	0.9	7,731	1.6
American Indian or Alaska Native	20	0.2	444	0.7	5,746	1.2
Asian	337	3.1	2,900	4.9	19,261	3.9
Native Hawaiian or other Pacific Islander	0	0.0	121	0.2	1,669	0.3
Some other Race	507	4.7	6,156	10.4	54,113	10.9
Two or more Races	449	4.1	2,388	4.0	24,074	4.9
Hispanic or Latino (of any race)						
Hispanic or Latino	1,598	14.7	13,020	21.9	127,774	25.8
Not Hispanic or Latino	9,299	85.3	46,320	78.1	367,304	74.2
Total Minority Population						
White alone, not of Hispanic or Latino origin	8,749	80.3	40,551	68.3	320,545	64.7
Minority (non-white and/or Hispanic or Latino)	2,148	19.7	18,789	31.7	174,533	35.3

SOURCE: U.S. Census Bureau, 2016a

Table 3.18-4 presents estimates of household income and poverty status for the Cities of Sonoma and Petaluma and County of Sonoma from the 2011-2015 American Community Survey. While median household income was higher in the City of Petaluma than in the City of Sonoma or Sonoma County as a whole, the percentage of individuals with family income below the poverty threshold were similar in all three geographies.

TABLE 3.18-4: INCOME AND POVERTY STATUS: CITIES OF SONOMA AND PETALUMA AND SONOMA COUNTY, 2011-2015

	City of Sonoma	City of Petaluma	Sonoma County
Median Household Income	$62,516	$80,276	$64,240
Individuals with Family Income Below Poverty Threshold[a]	10.4%	9.3%	11.7%

NOTE:

[a] Poverty thresholds for individuals are calculated by the U.S Census Bureau based on a range of incomes and thresholds appropriate for an individual's family size and composition. Therefore, ACS estimations do not use one threshold, but a range of thresholds which are appropriate for various family sizes. Please refer to reference document US Census Bureau 2015a for the range of thresholds used in the ACS 2011-2015 (US Census Bureau 2015a; US Census Bureau 2015b.

SOURCE: U.S. Census Bureau, 2016b

3.18.1.3 Napa SD and City of American Canyon

Table 3.18-5 provides race- and origin-related demographic estimates for the cities of Napa and American Canyon and Napa County from the 2011-2015 American Community Survey. The City of Napa and Napa County are majority white, with 2 or fewer percent Black or African American residents and about 15 percent identifying as a race not listed in the survey (i.e., some other race), or two or more races. More people in the City of Napa than in Napa County identify as Hispanic or Latino, with about 39 percent in the city and 33 percent in the county as a whole. Both had a similar total minority population percentage of about 45 to 46 percent.

The City of American Canyon, by contrast, is not majority white, and has a relatively large Asian population (about 35 percent), with most Asian residents identifying as Filipino (U.S. Census Bureau, 2016a), and a larger population of Black or African American residents (8 percent) compared to the County as a whole. A smaller percentage (about 27 percent) identify as Hispanic or Latino compared to the County's 33 percent. The total minority population in American Canyon is nearly 75 percent.

TABLE 3.18-5: RACE AND ORIGIN: CITIES OF NAPA AND AMERICAN CANYON AND NAPA COUNTY, 2011-2015

	City of Napa		City of American Canyon		Napa County	
	Number	Percent of Total Population	Number	Percent of Total Population	Number	Percent of Total Population
Total Population	79,113	--	20,271	--	140,295	--
Race						
White	61,697	78.0	8,311	41.0	103,914	74.1
Black or African American	631	0.8	1,594	7.9	2,944	2.1
American Indian or Alaska Native	859	1.1	38	0.2	987	0.7
Asian	2,134	2.7	7,171	35.4	10,817	7.7
Native Hawaiian or other Pacific Islander	119	0.2	38	0.2	288	0.2
Some other Race	11,090	14.0	1,876	9.3	16,211	11.6
Two or more Races	2,583	3.3	1,243	6.1	5,134	3.7
Hispanic or Latino (of any race)						
Hispanic or Latino	31,113	39.3	5,532	27.3	46,689	33.3
Not Hispanic or Latino	48,000	60.7	14,739	72.7	93,606	66.7
Total Minority Population						
White alone, not of Hispanic or Latino origin	43,278	54.7	5,111	25.2	76,016	54.2
Minority (non-white and/or Hispanic or Latino)	35,835	45.3	15,160	74.8	64,279	45.8

SOURCE: U.S. Census Bureau, 2016a

Table 3.18-6 presents estimates of household income and poverty status for the cities of Napa and American Canyon and Napa County from the 2011-2015 American Community Survey. Median household incomes are similar in the City of Napa and Napa County, and slightly higher in American Canyon. American Canyon has a slightly higher percentage of individuals with family incomes below the poverty threshold (11.8 percent) compared to the City of Napa and Napa County, which have similar percentages (9.5 and 10.3 percent, respectively).

TABLE 3.18-6: INCOME AND POVERTY STATUS: CITIES OF NAPA AND AMERICAN CANYON AND NAPA COUNTY, 2011-2015

	City of Napa	City of American Canyon	Napa County
Median Household Income	$68,038	$75,997	$71,379
Individuals with Family Income Below Poverty Threshold	9.5%	11.8%	10.3%

NOTE:

[a] Poverty thresholds for individuals are calculated by the U.S Census Bureau based on a range of incomes and thresholds appropriate for an individual's family size and composition. Therefore, ACS estimations do not use one threshold, but a range of thresholds which are appropriate for various family sizes. Please refer to reference document US Census Bureau 2015a for the range of thresholds used in the ACS 2011-2015 (US Census Bureau 2015a; US Census Bureau 2015b

SOURCE: U.S. Census Bureau, 2016b

3.18.1.4 Identification of Minority and Low-Income Populations

Minority Populations

As shown **in Tables 3.18-1**, **3.18-3**, and **3.18-5**, there are no specific minority populations greater than 50 percent in any of the cities and counties in the study area. The City of American Canyon is the only city or county in the study area with a total (aggregated) minority population greater than 50 percent.

The City of San Rafael has a total minority population of 42.6 percent, which is more than 1.5 times the total minority population of Marin County as a whole. Therefore, the City of San Rafael represents a meaningfully greater concentration of minority population compared to the county. The City of Sonoma has a much lower total minority population than Sonoma County as a whole, indicating that minority residents are not concentrated within the city. The City of Petaluma had a slightly lower minority population than Sonoma County. The City of Napa has a similar total minority population compared to Napa County as a whole.

Based on this information, the cities of American Canyon and San Rafael are considered to have minority populations for purposes of this environmental justice analysis.

Additionally, **Table 3.18-7** provides information about the total minority population of census tracts within which physical Program components would be located. Census tracts with greater than 50 percent total minority population or more than 1.5 times the total minority population of the respective county include Tracts 1122.02 and 1220 in San Rafael, and Tracts 2010.03, 2010.04, 2010.05, and 2010.06 in American Canyon. Therefore, in addition to the cities of American Canyon and San Rafael as a whole, these individual census tracts are considered to have minority populations for purposes of this environmental justice analysis.

TABLE 3.18-7: MINORITY POPULATIONS OF STUDY AREA CENSUS TRACTS, 2011-2015

Census Tract	Percent Total Minority Population
Marin County	
Census Tract 1012	35.0
Census Tract 1122.02	**82.4**
Census Tract 1212	22.5
Census Tract 1220	**84.3**
Sonoma County	
Census Tract 1501	12.5
Census Tract 1502.02	27.7
Census Tract 1503.04	42.3
Census Tract 1506.01	39.3
Census Tract 1506.02	27.5
Census Tract 1506.03	35.0
Census Tract 1506.07	26.2
Census Tract 1506.09	32.3
Census Tract 1506.10	29.9
Census Tract 1506.12	20.2
Census Tract 1507.01	38.3
Census Tract 1509.01	44.9
Napa County	
Census Tract 2010.03	**74.4**
Census Tract 2010.04	**79.5**
Census Tract 2010.05	**65.1**
Census Tract 2010.06	**60.5**

SOURCE: U.S. Census Bureau, 2016a

Low-Income Populations

As shown in **Table 3.18-2**, the City of San Rafael has a 13.2 percent rate of individuals with family incomes below the poverty threshold, compared to 8.3 percent for Marin County as a whole. The city's rate is greater than 1.5 times the county's rate, and therefore considered meaningfully greater for the purposes of this environmental justice analysis. As shown in **Tables 3.18-4** and **3.18-6**, there are no other such disparities among poverty rates in other cities and counties in the study area.

As shown in **Tables 3.18-2**, **3.18-4**, and **3.18-6**, there are no cities or counties in the study area with median incomes below the $49,000 threshold for disadvantaged communities per the California Water Code definition used by the IRWM guidelines (DWR, 2016).

Based on this information, the City of San Rafael is considered to have low-income populations for purposes of this environmental justice analysis.

Additionally, **Table 3.18-8** provides information about the median incomes and poverty status of census tracts within which physical Phase 2 Program components would be located. No census tracts have median incomes below the $49,000 threshold for disadvantaged communities. Census tracts with more than 1.5 times the poverty rate of the respective county include 1122.02 in

San Rafael and 2010.06 in American Canyon. Therefore, in addition to San Rafael as a whole, these individual census tracts are considered to have low-income populations for purposes of this environmental justice analysis.

TABLE 3.18-8: INCOME AND POVERTY STATUS OF STUDY AREA CENSUS TRACTS, 2011-2015

Census Tract	Median Income	Percent of Individuals with Family Incomes Below Poverty Threshold[a]
Marin County		
Census Tract 1012	86,339	10.2
Census Tract 1122.02	**66,053**	**14.8**
Census Tract 1212	87,159	7.9
Census Tract 1220	-[b]	-[b]
Sonoma County		
Census Tract 1501	88,625	8.2
Census Tract 1502.02	67,155	5.1
Census Tract 1503.04	75,152	11.0
Census Tract 1506.01	84,000	7.6
Census Tract 1506.02	82,372	6.4
Census Tract 1506.03	67,377	9.9
Census Tract 1506.07	109,181	4.9
Census Tract 1506.09	54,167	6.8
Census Tract 1506.10	91,932	11.0
Census Tract 1506.12	102,115	3.7
Census Tract 1507.01	70,016	16.3
Census Tract 1509.01	59,542	11.8
Napa County		
Census Tract 2010.03	82,222	13.9
Census Tract 2010.04	68,689	12.1
Census Tract 2010.05	83,983	9.8
Census Tract 2010.06	**67,411**	**16.1**

NOTES:

[a] Poverty thresholds for individuals are calculated by the U.S Census Bureau based on a range of incomes and thresholds appropriate for an individual's family size and composition. Therefore, ACS estimations do not use one threshold, but a range of thresholds which are appropriate for various family sizes. Please refer to reference document US Census Bureau 2015a for the range of thresholds used in the ACS 2011-2015 (US Census Bureau 2015a; US Census Bureau 2015b.

[b] Incomes not reported for Census Tract 1220. This census tract consists of the incarcerated population of San Quentin State Prison.

SOURCE: U.S. Census Bureau, 2016b

3.18.1.5 Other Populations of Environmental Justice Concern

In addition to the above-described populations that may be subject to environmental or socioeconomic impacts of the project, this analysis considers potential impacts on farmworkers as a result of changes in agricultural labor or practices that may be caused by project implementation.

Approximately 90 percent of farmworkers in California identify as Hispanic or Latino, and about 30 percent of farmworker-supported families have incomes below the poverty threshold, a substantially higher percentage than the general populations of cities and counties described above (California Research Bureau, 2013). Therefore, farmworkers are considered a minority and low-income population for the purposes of this analysis.

3.18.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Environmental Justice issues and used to determine the significance criteria presented in **Section 3.18.3.1** is found in **Appendix 3.18A**.

3.18.3 Direct and Indirect Effects

3.18.3.1 CEQA Considerations

As described in **Section 3.18.3.2** a CEQA Lead Agency may use information about the economic or social impacts of a project to determine the significance of physical changes caused by the project, but the economic or social effects of a project are not treated as significant effects on the environment. Additionally, CEQA does not use the term "environmental justice" or require the evaluation of impacts on minority or low-income communities in the way required by Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The Office of the California Attorney General (OAG) has clarified that environmental justice concerns are relevant to the analysis of a project under CEQA, but has recommended that lead agencies address environmental justice by evaluating whether a project's impacts would affect a community whose residents are particularly sensitive to the impact (i.e., sensitive receptors) and whether a project would have significant effects on communities when considered together with any environmental burdens those communities already are bearing, or may bear from probable future projects (i.e., cumulative impacts) (OAG, 2012).

The impacts of the Proposed Action on sensitive receptors are analyzed where appropriate (e.g., in **Section 3.9**, ***Air Quality***, and in **Section 3.12**, ***Hazards and Hazardous Materials***). The Proposed Action's impacts considered together with existing or foreseeable environmental burdens experienced by nearby communities are analyzed in Chapter 4.0, *Cumulative Impacts*. Further, the OAG indicates that a lead agency must be clear and transparent in its Statement of Overriding Considerations about the balances it has struck in approving a project, such as whether the benefits of the project will be enjoyed widely, but the environmental burdens of a project will be felt particularly by the neighboring communities (OAG, 2012). The information presented in this section will inform such a statement if and when the Proposed Action is approved in the event that a significant unavoidable impact is identified under CEQA. Significance determinations in this section, however, do not apply to the CEQA analysis. Rather, the conclusions in this section are relevant only to the NEPA analysis of the Proposed Action.

3.18.3.2 NEPA Considerations

This section describes environmental justice effects relative to both minority and low-income populations in the NBWRA Phase 2 area, as required in Executive Order 12898 mentioned above. The analysis identifies potentially significant impacts on air quality, traffic, and noise from construction and operation of the elements of NBWRP Phase 2 that may disproportionately affect minority or low-income communities. The analysis also discusses potential environmental justice impacts from increased water and sewer fees and changes in farm worker employment.

3.18.3.3 Identification of Disproportionately High and Adverse Environmental Effects

NBWRP Phase 2 or an alternative would result in a significant environmental justice impact if it would result in one or more of the following:

1. An impact to the natural or physical environment that significantly and disproportionately adversely affects the identified minority or low-income population. Such effects may include ecological, cultural, human health, economic, or social impacts on the identified communities when those impacts are interrelated with impacts to the natural or physical environment.
2. A significant environmental effect that would result in an adverse impact on the identified population that appreciably exceeds or is likely to appreciably exceed that impact on the general population or other appropriate comparison group.

3.18.3.4 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Recycling Facility (WRF), and 600 AF of tertiary treated water storage for Napa SD along with 9.24 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility

construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.18.1: Project construction could result in significant environmental impacts that could disproportionately affect minority or low-income populations. (Less than Significant with Mitigation)

No Project/No Action Alternative

There would be no construction-related impacts associated with the No Project Alternative that could result in disproportionate adverse effects on minority or low-income populations. There would be **no impact**.

None of these projects under the No Action Alternative would result in disproportionate adverse effects on minority or low-income populations. There would be **no impact**.

Proposed Action

Low-income and minority populations are defined in **Section 3.18.1.4** and include the cities of San Rafael and American Canyon, as well as individual census tracts within these cities. To determine whether there were any environmental impacts that could disproportionately affect these communities of concern, all of the individual resource issue area analyses in **Sections 3.2** through **3.19** of this EIR/EIS were evaluated. In reviewing each of these sections, this environmental justice analysis considers potential impacts and mitigation measures and whether a "disproportionately high and adverse" (CEQ, 1997) impact would result for the minority or low-income populations identified. Only **Section 3.9**, ***Air Quality***, described impacts that could result in a disproportionately high and adverse impact on minority and/or low-income populations.

Health effects resulting from decreased air quality, specifically on minority or low-income populations, are location-based and dependent on the varying components of the Program. **Table 3.18-9** provides the estimated maximum daily construction emissions of reactive organic gases (ROG), nitrogen oxides (NOx), carbon monoxide (CO), particulate matter less than 10 microns (PM_{10}), and particulate matter less than 2.5 microns ($PM_{2.5}$) that would potentially result from Program components that would be located closest to the identified minority and low-income populations. These components are displayed on **Figure 2-2** and the information in this table is taken from **Table 3.9-5**, Estimated Maximum Daily Construction Exhaust Emissions, **Section 3.9**, ***Air Quality***.

As described in Impact 3.9.1 in **Section 3.9**, the only criteria pollutant that would result in an exceedance of BAAQMD significance thresholds is NOx, which is regulated as both an ozone precursor and a source of NO_2 in the Bay Area. All other criteria pollutants would have total emissions below BAAQMD significance thresholds and USEPA de minimis levels, and subtotals for components near specific minority and low-income populations would be below significance thresholds and de minimis levels for all pollutants. Therefore, with respect to localized emissions near minority and low-income populations, the Program components would not result in a substantial adverse impact. Furthermore, the subtotals reported in **Table 3.18-7** for components near the City of San Rafael and American Canyon do not differ substantially from the subtotals reported in **Table 3.9-5** for components near non-minority and non-low-income populations. Therefore, there is no potential for a disproportionate impact from construction emissions in San Rafael or American Canyon. Although some construction emissions would occur in these locations, they would not be disproportionately high and adverse, and therefore would not result in an adverse environmental justice impact (**less than significant**).

TABLE 3.18-9: ESTIMATED MAXIMUM DAILY AVERAGE CONSTRUCTION EXHAUST EMISSIONS NEAR MINORITY AND LOW-INCOME POPULATIONS

Project Component by Location	Average Daily Emission Estimates (pounds per day)				
	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
City of San Rafael					
San Quentin Prison Recycled Water Distribution System	0.88	9.61	6.58	0.42	0.40
San Quentin Prison Recycled Water Distribution System - Pipeline	2.38	24.65	20.40	1.16	1.09
Subtotal	*3.27*	*34.26*	*26.98*	*1.58*	*1.50*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	2.58	27.22	21.85	1.24	1.17
Subtotal	*2.58*	*27.22*	*21.85*	*1.24*	*1.17*
BAAQMD Significance Thresholds	54	54	--	82	54
USEPA De Minimis Level	100	100	100	--	100

SOURCE: ESA, 2017. See **Appendix 3.9**.

Furthermore, implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b** would substantially reduce emissions ROG, NOx, PM_{10}, and $PM_{2.5}$. Although implementation of these measures is not necessary to avoid a disproportionately high and adverse environmental justice impact, it would further improve emissions from all Program components, including those near San Rafael and American Canyon.

As described in Impact 3.9.4, parts of NBWRP Phase 2 that would involve construction activities lasting longer than two months within 1,000 feet of any given sensitive receptor include the following: Novato SD's Recycled Water Facility (RWF) Treatment Capacity Expansion; MMWD's proposed treatment facilities at the CMSA treatment facility, and City of Petaluma's Ellis Creek WRF Increased Capacity Project. The MMWD facilities would be 900 feet from the closest living quarters, which are located within Census Tract 1220. Uncontrolled construction activities at such a distance can result in moderate to high sensitive receptor exposure to DPM emissions, causing potentially significant health risk impacts. Novato SD's RWF Treatment Capacity Expansion (550 feet from closest residence) and the City of Petaluma's Ellis Creek WRF Increased Capacity Project (450 feet from closest residence) also would result in potentially significant health risk impacts from uncontrolled construction, and neither is located in proximity to an identified minority or low-income community. Therefore, potential impacts within Census Tract 1220 may not be disproportionately high and adverse compared to communities located near NBWRP Phase 2. Regardless, implementation of **Mitigation Measure 3.9.1-1b** would reduce uncontrolled project-related DPM emissions by approximately 99 percent, ensuring that after mitigation, adverse impacts on sensitive receptors in Census Tract 1220 would be substantially avoided, and therefore would not result in an adverse environmental justice impact (**less than significant with mitigation**).

Program Elements

The six additional projects that comprise the Program Elements would not be located within or near the cities of San Rafael and American Canyon and, therefore, as currently proposed would have no potential to result in a disproportionately high and adverse environmental justice impact. There would be **no impact**.

Storage Alternative

These additional Storage Alternative projects would not be located within or near the cities of San Rafael and American Canyon and, therefore, as currently proposed would have no potential to result in a disproportionately high and adverse environmental justice impact. There would be **no impact**.

Mitigation Measures

Mitigation Measures 3.9.1-1a and 3.9.1-1b

(See Impact 3.9.1 in **Section 3.9*, Air Quality***, for descriptions.)

Impact Significance after Mitigation: Less than significant.

Impact 3.18.2: Project operation could result in significant environmental impacts that could disproportionately affect minority or low-income populations. (No Impact)

No Project/No Action Alternative

Under the No Project Alternative, no new facilities would be operated. Consequently, there would be no operational impacts that could result in disproportionate adverse effects on minority or low-income populations. There would be **no impact**.

None of the projects under the No Action Alternative would result in disproportionate adverse effects on minority or low-income populations. There would be **no impact**.

Proposed Action

As described in **Section 3.9**, other than emissions from existing power sources supplying the regional power grid, the locations of which cannot be known with certainty, the only operational emission sources that would be associated with NBWRP Phase 2 would be stand-by emergency diesel generators that would be installed associated with the plant capacity increase and pump station components to provide emergency back-up power. As shown in **Table 3.9-8** in **Section 3.9**, maximum annual emissions from emergency generators associated with the MMWD San Quentin Prison Recycled Water Distribution System and City of American Canyon Water Reclamation Facility Phase 2 Treatment Plant Upgrades, located in and near the cities of San Rafael and American Canyon, respectively, would be negligible. Furthermore, emissions from these facilities would be similar to or lower than emissions from facilities located further from minority and low-income populations. No disproportionately high and adverse impact would occur as a result of Program operational emissions; therefore, **no impact** would occur.

Program Elements

The six additional Project Elements would not be located within or near the cities of San Rafael and American Canyon and, therefore, as currently proposed would have no potential to result in a disproportionately high and adverse environmental justice impact. There would be **no impact**.

Storage Alternative

These additional Storage Alternative projects would not be located within or near the cities of San Rafael and American Canyon and, therefore, as currently proposed would have no potential to result in a disproportionately high and adverse environmental justice impact. There would be **no impact**.

Mitigation Measures

None required.

Impact 3.18.3: The Project could result in an increase water and sewer fees that would disproportionately affect minority or low-income populations. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative, as there would be no operational impacts that could result in disproportionate adverse effects on minority or low-income populations.

The No Action Alternative, which includes consideration of future conditions, is likely to implement some of NBWRP Phase 2 by Member Agencies on an individual basis, without the benefit of regional coordination and potentially without federal funding. Alternatively, other types of water supply projects may be developed to increase water supplies and reliability, and such projects may be more expensive to implement (Brown and Caldwell, 2017). Under future baseline (2035) conditions, water and sewer charges within the region are anticipated to increase and would occur in accordance with anticipated development allowed under the approved general plans within the region. As described for the proposed action, the total increases are unknown at this time and would be applied equally to all customers experiencing the benefits of these potential projects. Therefore, it is assumed that impacts would not be disproportionately high and adverse (**less than significant**).

Like the Proposed Action, cost for the No Action Alternative would increase user fees in the service areas of those participating Member Agencies. However, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. In any event, none of the No Action Alternative elements would be located in San Rafael or American Canyon. Therefore, any potential increase in resulting user fees would disproportionately affect minority or low-income populations.

Proposed Action

As described in Impact 3.19.4 in **Section 3.19**, ***Socioeconomics***, it is assumed that NBWRP Phase 2 costs would increase user fees and/or rates; however, the extent of increase is not known at this time. While it is assumed that increased water and sewer fees and/or rates would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time. Therefore, the extent to which customers in San Rafael and American Canyon would experience fee and/or rate increases compared to customers outside these communities cannot be known. Although the fees or any increased water and sewer rates would be applied equally to all customers in the service areas (i.e., not only to minority and low-income populations or customers), the effects of such increases could disproportionately burden low-income customers compared to non-low-income customers because increases would represent a greater percentage of their incomes and disposable personal incomes. Such effects could occur for low-income customers in all service areas, and would not be limited to the identified low-income communities described above. Some Member Agencies have discounted rate programs or other forms of assistance for low-income customers. MMWD's Discounted Rate Programs include the Service Charge Waiver Program and the Medical Disability Discount, each of which offers specific fee waivers to qualifying customers (MMWD, 2017). The Napa SD's Low Income Assistance Program provides discounted sewer service to low-income owner-occupied homes and non-profit organizations serving low-income renters (Napa SD, 2017). These programs would partially offset total costs for qualifying low-income customers in these service areas. Although the effects of fee and/or rate increases may be experienced disproportionately by low-income customers, the total increases are unknown at this time and would be applied equally to all customers experiencing the benefits of NBWRP Phase 2. Therefore, it is assumed that impacts would not be disproportionately high and adverse (**less than significant**).

Program Elements

Costs for the Program Elements would increase user fees in the service areas of those participating Member Agencies. However, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. Therefore, any potential increase in resulting user fees would disproportionately affect minority or low-income populations.

Storage Alternative

Like the Proposed Action, cost for the Storage Alternative would increase user fees; however, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. However, the use of recycled water may have a beneficial effect on future water and sewer fees by postponing fee increases for development of other water sources. Although the effects of fee and/or rate increases may be experienced disproportionately by low-income customers, the total increases are unknown at this time and would be applied equally to all customers experiencing the benefits of NBWRP Phase 2. Therefore, it is assumed that impacts would not be disproportionately high and adverse (**less than significant**).

Mitigation Measures

None required.

Impact 3.18.4: The Project could adversely affect farm worker employment. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative, as no change in water reliability for vineyards would occur that may affect agricultural production and farm employment.

As would be the case with the Proposed Action, the four elements comprising the No Action Alternative would provide some additional reliable water supply for irrigation of existing vineyards in both Napa and Sonoma counties, which would help maintain, and may increase vineyard production in the long term. Increased agricultural production could increase farm employment. The increase in farm jobs would affect both minority and non-minority populations; however, it may result in a beneficial effect on employment levels of foreign-born and/or minority farm workers. Therefore, impacts would not be disproportionately high and adverse (**less than significant**).

Proposed Action

As described in Impact 3.19.3 in **Section 3.19**, recycled water deliveries would provide a more reliable water supply for irrigation of existing vineyards in both Napa and Sonoma counties, which would help maintain, and may increase vineyard production in the long term. Increased agricultural production could increase farm employment. The increase in farm jobs would affect both minority and non-minority populations; however, it may result in a beneficial effect on employment levels of foreign-born and/or minority farm workers. Therefore, impacts would not be disproportionately high and adverse (**less than significant**).

Program Elements

The Program Elements would provide some additional reliable water supply for irrigation of existing vineyards in both Napa and Sonoma counties, which would help maintain, and may increase vineyard production in the long term. Increased agricultural production could increase farm employment. The increase in farm jobs would affect both minority and non-minority populations; however, it may result in a beneficial effect on employment levels of foreign-born and/or minority farm workers. Therefore, impacts would not be disproportionately high and adverse (**less than significant**).

Storage Alternative

As would be the case with the Proposed Action, the four elements comprising the No Action Alternative would provide some additional reliable water supply for irrigation of existing vineyards in both Napa and Sonoma counties, which would help maintain, and may increase, vineyard production in the long term. Increased agricultural production could increase farm employment. The increase in farm jobs would affect both minority and non-minority populations; however, it may result in a

beneficial effect on employment levels of foreign-born and/or minority farm workers. Therefore, impacts would not be disproportionately high and adverse (**less than significant**).

Most of the Storage Alternative elements, all of them are proposed explicitly to serve agricultural customers. Agricultural users, some of which could be vineyards in the area, would receive 949 AFY from these Storage Alternative elements which would help maintain vineyard production in the long term. Increased agricultural production could increase farm employment. The increase in farm jobs would affect both minority and non-minority populations; however, it may result in a beneficial effect on employment levels of foreign-born and/or minority farm workers. Therefore, impacts would not be disproportionately high and adverse (**less than significant**).

Mitigation Measures

None required.

3.18.3.5 Impact Summary by Service Area

Appendix 3.18B provides a summary of potential Project impacts per Member Agency related to environmental justice.

3.19 Socioeconomics

This section describes population, employment, and other socio-economic considerations (including jobs, wages, and salaries) in the project area in Section 3.19.1, *Affected Environment*. Setting information and the Regulatory Framework that governs the resources is presented in Appendix 3.19A. Section 3.19.3, *Direct and Indirect Effects*, explains the context for analyzing economic or social effects under NEPA, identifies the significance criteria used under CEQA and NEPA to assess potential impacts, analyzes potential direct and indirect impacts of NBWRA Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. No comments or other input were received during the scoping period for this EIR/EIS regarding socioeconomics.

3.19.1 Affected Environment

Socioeconomic data is typically available at the county and city levels; therefore, Marin, Sonoma, and Napa County data are presented along with city level data for the cities of Novato, San Rafael, Petaluma, Sonoma, and Napa.

3.19.1.1 Population and Employment

Marin County. In 2015, Marin County had a population of approximately 258,000 (U.S. Census Bureau, 2016b). Total personal income in Marin County was approximately $28.5 billion and per capita personal income was $109,076 (Bureau of Economic Analysis [BEA], 2016, 2015).[1]

Table 3.19-1 shows 2015 industry earnings and employment in Marin County. Top-earning industries include professional and technical services, government and government enterprises, health care and social assistance, and construction. Professional and technical services employed the most people, followed by health care and social assistance, then retail trade. The unemployment rate in Marin County in 2016 was 3.2 percent, well below the state average of 5.4 percent (Employment Development Department [EDD], 2017).

Table 3.19-2 shows estimates of employment in Novato and San Rafael by industry from the 2011-2015 American Community Survey. The largest industries by employment in both Novato and San Rafael were education, health and social services and professional, scientific, management, administrative, and waste management.

Sonoma County. In 2015, Sonoma County had a population of approximately 495,000 (U.S. Census Bureau, 2016b). Total personal income in Sonoma County was approximately $26.9 billion and per capita personal income was $53,520 (BEA, 2016, 2015).

Table 3.19-3 shows 2015 industry earnings and employment in Sonoma County. Top-earning industries were government and government enterprises, manufacturing and health care and social assistance. Health care and social assistance employed the most people, followed by retail trade, and government and government enterprises, and manufacturing. The unemployment rate in Sonoma County in 2016 was 4.0 percent, which was below the state average of 5.4 percent (EDD, 2017).

Table 3.19-4 shows estimates of employment in the cities of Sonoma and Petaluma by industry from the 2011-2015 American Community Survey. The largest industries by employment in Sonoma were education, health, and social services; professional, scientific, management, administrative, and waste management; and arts, entertainment, recreation, accommodation, and food service. The largest industries by employment in Petaluma were education, health, and social services; professional, scientific, management, administrative, and waste management; and retail trade.

Napa County. In 2015, Napa County had a population of approximately 140,000. Total personal income in Napa County was approximately $8.8 billion and per capita personal income was $61,483 (BEA, 2016, 2015). **Table 3.19-5** shows 2015 industry and employment earnings in Napa County. Top-earning industries were manufacturing, government and government enterprises, and health care and social assistance. Manufacturing employed the most people, followed by accommodation and food services, and government and government enterprises. The unemployment rate in Napa County in 2016 was 4.3 percent, which was below the state average of 5.4 percent (EDD, 2017).

Table 3.19-6 shows estimates of employment in the cities of Napa and American Canyon by industry from the 2011-2015 American Community Survey. The largest industries by employment in Napa were education, health, and social services; arts, entertainment, recreation, accommodation, and food service; and manufacturing. The largest industries by employment in American Canyon were education, health, and social services; manufacturing; and arts, entertainment, recreation, accommodation, and food service.

[1] Personal income is the income received by persons from all sources. It is calculated as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance. Per capita personal income is calculated as the personal income of the residents of a given area divided by the resident population of the area. In computing per capita personal income, BEA uses the Census Bureau's annual midyear population estimates.

TABLE 3.19-1: INDUSTRY EARNINGS AND INDUSTRY EMPLOYMENT, MARIN COUNTY, 2015

Industry	Earnings (thousands $)	Employment (jobs)
Forestry, fishing, related activities, and other	(D)	(D)
Mining	(D)	(D)
Utilities	(D)	(D)
Construction	$895,952	10,271
Manufacturing	$633,233	5,162
Wholesale trade	$459,909	4,926
Retail trade	$890,874	17,653
Transportation and warehousing	(D)	(D)
Information	$539,470	4,215
Finance and insurance	$866,242	11,706
Real estate and rental and leasing	$695,010	14,847
Professional and technical services	$2,111,871	26,226
Management of companies and enterprises	$431,082	2,556
Administrative and waste services	$454,738	11,715
Educational services	$316,795	7,498
Health care and social assistance	$1,441,877	21,877
Arts, entertainment, and recreation	$478,604	8,620
Accommodation and food services	$556,451	14,335
Other services, except public administration	$714,917	13,738
Government and government enterprises	$1,710,722	15,989
Total	**$13,415,506**	**195,366**

NOTE: (D) BEA Note - Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

SOURCE: BEA, 2016b

TABLE 3.19-2: SAN RAFAEL AND NOVATO EMPLOYMENT BY INDUSTRY, 2011-2015

	Novato		San Rafael	
Industry	Number Employed	Percent of All Industries	Number Employed	Percent of All Industries
Agriculture, Forestry, Fisheries, and Mining	147	0.5%	133	0.4%
Construction	1,719	6.4%	1,772	5.9%
Manufacturing	1,055	3.9%	1,385	4.6%
Wholesale Trade	783	2.9%	485	1.6%
Retail trade	3,482	12.9%	3,296	11.0%
Transportation, warehousing, utilities	997	3.7%	709	2.4%
Information	780	2.9%	902	3.0%
Finance, Insurance, Real Estate	2,720	10.1%	2,318	7.7%
Professional, scientific, management, administrative, waste management	3,806	14.1%	5,743	19.2%
Education, health, and social services	6,217	23.1%	6,083	20.3%
Arts, entertainment, recreation, accommodation, and food service	2,339	8.7%	3,609	12.1%
Other services	1,604	6.0%	2,355	7.9%
Public administration	1,258	4.7%	1,129	3.8%
Total	**26,907**	**--**	**29,919**	**--**

SOURCE: U.S. Census Bureau, 2016a

TABLE 3.19-3: INDUSTRY EARNINGS AND INDUSTRY EMPLOYMENT, SONOMA COUNTY, 2015

Industry	Earnings (thousands $)	Employment (jobs)
Forestry, fishing, related activities, and other	$127,611	2,996
Mining	$23,686	812
Utilities	$121,573	739
Construction	$1,593,743	19,134
Manufacturing	$2,259,100	24,938
Wholesale trade	$719,358	10,312
Retail trade	$1,249,536	31,171
Transportation and warehousing	$294,074	5,423
Information	$367,031,00	4,115
Finance and insurance	$552,334	10,492
Real estate and rental and leasing	$472,535	14,729
Professional and technical services	$1,280,211	23,263
Management of companies and enterprises	$357,978	2,298
Administrative and waste services	$533,723	16,962
Educational services	$126,617	5,205
Health care and social assistance	$2,150,479	36,329
Arts, entertainment, and recreation	$230,602	9,201
Accommodation and food services	$700,668	23,715
Other services, except public administration	$830,032	18,491
Government and government enterprises	$2,442,698	30,054
Total	**$16,720,283**	**296,678**

SOURCE: BEA, 2016b

TABLE 3.19-4: CITY OF SONOMA AND PETALUMA EMPLOYMENT BY INDUSTRY, 2011-2015

	Sonoma		Petaluma	
Industry	Number Employed	Percent of All Industries	Number Employed	Percent of All Industries
Agriculture, Forestry, Fisheries, and Mining	160	3.2%	477	1.6%
Construction	435	8.6%	2,297	7.6%
Manufacturing	439	8.7%	1,954	6.5%
Wholesale Trade	106	2.1%	948	3.2%
Retail trade	389	7.7%	3,407	11.3%
Transportation, warehousing, utilities	142	2.8%	1,062	3.5%
Information	46	0.9%	996	3.3%
Finance, Insurance, Real Estate	227	4.5%	2,373	7.9%
Professional, scientific, management, administrative, waste management	759	15.0%	3,806	12.7%
Education, health, and social services	1,350	26.7%	6,453	21.5%
Arts, entertainment, recreation, accommodation, and food service	596	11.8%	3,169	10.6%
Other services	223	4.4%	1,607	5.4%
Public administration	180	3.6%	1,482	4.9%
Total	**5,052**	**--**	**30,031**	--

SOURCE: U.S. Census Bureau, 2016a

TABLE 3.19-5: INDUSTRY EARNINGS AND INDUSTRY EMPLOYMENT, NAPA COUNTY, 2015

Industry	Earnings (thousands $)	Employment (jobs)
Forestry, fishing, related activities, and other (D)	(D)	(D)
Mining	(D)	(D)
Utilities	$24,651	162
Construction	$534,590	5,976
Manufacturing	$1,524,021	13,868
Wholesale trade	$225,668	2,663
Retail trade	$339,867	8,121
Transportation and warehousing	$148,513	2,389
Information	$60,976	740
Finance and insurance	$209,307	2,964
Real estate and rental and leasing	$153,859	4,216
Professional and technical services	$373,731	5,849
Management of companies and enterprises	$59,894	609
Administrative and waste services	$217,008	6,680
Educational services	$73,445	1,916
Health care and social assistance	$600,821	9,780
Arts, entertainment, and recreation	$46,232	1,890
Accommodation and food services	$550,278	12,963
Other services, except public administration	$228,421	5,245
Government and government enterprises	$989,830	10,631
Total	**$6,654,862**	**103,236**

NOTE: (D) BEA Note - Some subcategories not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.
SOURCE: BEA, 2016b

TABLE 3.19-6: CITY OF NAPA AND AMERICAN CANYON EMPLOYMENT BY INDUSTRY, 2011-2015

Industry	Napa		American Canyon	
	Number Employed	Percent of All Industries	Number Employed	Percent of All Industries
Agriculture, Forestry, Fisheries, and Mining	2,664	6.7%	138	1.5%
Construction	2,217	5.6%	597	6.4%
Manufacturing	4,649	11.7%	1,015	10.9%
Wholesale Trade	1,159	2.9%	266	2.9%
Retail trade	4,426	11.1%	886	9.5%
Transportation, warehousing, utilities	1,012	2.5%	669	7.2%
Information	563	1.4%	120	1.3%
Finance, Insurance, Real Estate	2,030	5.1%	574	6.2%
Professional, scientific, management, administrative, waste management	3,718	9.3%	566	6.1%
Education, health, and social services	7,639	19.2%	2,671	28.7%
Arts, entertainment, recreation, accommodation, and food service	6,004	15.1%	953	10.2%
Other services	2,246	5.6%	383	4.1%
Public administration	1,494	3.8%	463	5.0%
Total	**39,821**	**--**	**9,301**	--

SOURCE: U.S. Census Bureau 2016a

3.19.1.2 Agricultural Economy

This section describes the agricultural economy in Sonoma and Napa counties. Marin County has limited agriculture, particularly within the NBWRP area. Such activity is primarily limited to hayfields and not to commercial agricultural production; therefore, it is not further discussed in this section. The primary agricultural land uses in the project area in southern Sonoma and Napa counties are vineyards and dairies.

Total gross value of agricultural production in 2016 in Sonoma County was approximately $898.1 million, representing a 17.2 percent increase from the 2015 value of $766.3 million. Total gross value of production of wine grapes in 2016 was approximately $586.5 million in Sonoma County, which was the highest in crop and nursery value of production in the County. In 2016, total wine grape bearing acreage was 60,008.5 acres and non-bearing acreage was 2,101.3 acres. The weighted average production value for wine grapes was $2,590 per ton. Market milk had the second highest value of production in Sonoma County, at approximately $146.5 million. Rye and oat silage, the field crop with the highest total value, was planted on 8,462 acres in 2016 and yielded 102,605 tons. Total value of production for rye and oat silage in 2016 was approximately $4 million (Sonoma County, 2016).

Total gross value of agricultural production in 2016 in Napa County was approximately $737.3 million, representing a 33.2 percent increase from the 2015 value of $553.3 million. Wine grapes had the highest gross value of production of all crops and livestock in Napa County, approximately $729.5 million. In 2016, total wine grape bearing acreage was 43,449 acres and non-bearing acreage was 2,432 acres. Livestock has the second highest gross production value, at approximately $3.4 million in 2016 (Napa County, 2017).

In addition to contributing to the counties' agricultural economies, wine grape production attracts a significant number of visitors to Napa and Sonoma counties to support the tourism industry, which provide major revenues and jobs to the counties. A 2015 Sonoma County visitor survey indicated that around 50 percent of visitors purchased wine while visiting (Sonoma County Economic Development Board, 2016). The category "winery" was ranked as the second most common primary operation of tourism industry businesses in Sonoma County in 2016. The total amount spent by visitors to Sonoma County in 2015 was $1.82 billion (Sonoma County Economic Development Board, 2016). The amount spent by visitors to Napa County in 2016 reached $1.9 billion. Wine tasting in wineries was the most common activity for visitors to Napa County. Around 72.7 percent of all visitors surveyed responded that they had visited or would visit a winery on their trip (Destination Analytics, 2016).

3.19.2 Regulatory Framework

The discussion of any federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Socioeconomic issues and used to determine the significance criteria are presented below in **Sections 3.19.3.1** and **3.19.3.2**.

3.19.3 Direct and Indirect Effects

3.19.3.1 CEQA Considerations

Per CEQA guidelines Section 15131, "Economic or social information may be included in an EIR or may be presented in whatever form the agency desires." The section continues:

a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. […] Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.

c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. […]

Although the economic or social effect of a project may be used to determine the significance of physical changes caused by the project, the analyses of other environmental resources in this document rely on resource-specific tools or qualitative discussions to determine the significance of environmental effects. Therefore, economic effects are not needed to judge the significance of changes to other environmental resource, and this section does not provide a CEQA analysis and associated significance criteria.

3.19.3.2 NEPA Considerations

Under NEPA, economic or social effects must be discussed if they are inter-related to the natural or physical environmental effects of a project. NEPA regulations state the following with regard to analysis of economic effects (Title 40, Code of Federal Regulations, Section 1508.14):

> "…economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment."

Since economic effects of the project are related to physical environmental effects, a NEPA economic analysis is required. However, NEPA does not require that economic impacts be judged for significance.

3.19.3.3 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage Alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Recycling Facility (WRF), and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

Impact 3.19.1: Project construction and operation would increase jobs, wages and salaries, resulting in regional economic benefits. (Less than Significant)

For the purpose of this analysis, the regional economy includes Marin, Napa, and Sonoma counties.

Construction activities would create jobs and generate economic activity within the region during the period of construction. Direct regional economic effects result from the purchase of materials and labor to construct project components. Secondary effects result from purchases made by suppliers of project materials and expenditures of project-generated income, both by project construction workers and by employees of goods and services providers.

No Project/No Action Alternative

Under the No Project Alternative, **no impact** would occur.

Under the No Action Alternative, the elements would have a total capital cost of approximately $18.6 million and an annual operation and maintenance cost of approximately $0.1 million. These elements would result in the same types of beneficial regional economic effects described below for the Proposed Action, but to a lesser degree due to the smaller overall cost.

Proposed Action

The Proposed Action includes construction of wastewater treatment plant upgrades, pipelines, pump stations, and new storage, all of which would require the purchase of construction materials and employment of engineers, construction supervisors, and general construction laborers. These activities would result in temporary increases in jobs, wages, and salaries, and would temporarily result in increased output in the regional economy. **Table 3.19-7** summarizes preliminary capital costs for NBWRP Phase 2, including materials and labor. The total capital costs for the NBWRP Phase 2 elements are estimated at approximately $68 million. The Program Elements would add another approximately $49 million.

If materials are purchased within the project area, regional economic output would increase. Materials purchased outside the project area would not result in economic benefits within the project area. Marin, Sonoma, and Napa counties do not have large wholesale trade sectors relative to nearby counties, including Alameda, Contra Costa, Sacramento, and San Francisco counties. Thus, many or most construction material purchases could occur outside of the region. Nonetheless, purchases within Marin, Napa, and Sonoma counties would result in direct and indirect economic benefits to the regional economy.

TABLE 3.19-7: ESTIMATES OF PROJECT CAPITAL COSTS, NBWRP PHASE 2 AND PROGRAM ELEMENTS

Agency	Projects	Capital Costs (millions)	Annual Operation and Maintenance Costs (millions)
Proposed Action			
Novato SD	RWF Treatment Capacity Expansion	$4.8	$0.19
	Marin County Lower Novato Creek Project 1 - Distribution	$0.9	-- [a]
	Turnout to Wetlands	$0.6	$0.02
SVCSD	Napa Road Pipeline	$3.6	$0.03
MMWD	San Quentin Prison Recycled Water Distribution System	$7.8	$0.06
Napa SD	Soscol WRF Increased Filter Capacity	$2.2	$0.27
	Soscol WRF Covered Storage	$2.9	$0.04
Petaluma	Ellis Creek WRF Increased Capacity	$9.0	$0.36
	Urban Recycled Water Expansion	$14.0	$0.06
	Agricultural Recycled Water Expansion – Phase 1	$4.3	$0.07
	Agricultural Recycled Water Expansion – Phase 2	$5.9	--[b]
American Canyon	Recycled Water Distribution System Expansion – Phase 1	$3.1	$0.03
	Recycled Water Distribution System Expansion – Phase 2	$2.9	$0.03
	WRF Phase 2 Treatment Plant Upgrades	$6.0	$0.10
	Total	**$68.0**	**$1.26**
Program Elements			
Novato SD	Option 1: Site Near Highway 37 (Tertiary) 150 AF	$5.7	$0.07
	Marin County Lower Novato Creek Project - Restoration	$21.5[c]	-- [a]
City of Petaluma	Agricultural Recycled Water Expansion Phase 3	$6.5	$0.04
Napa SD	Napa State Hospital Storage Tank	$7.4	$0.07
SCWA	Valley of the Moon ASR	$3.7	$0.13
	Sonoma ASR	$3.9	$0.12
	Total	**$48.7**	**$0.43**

NOTES: RWF = Recycled Water Facility WRF = Water Recycling Facility
ASR = Aquifer Storage and Recovery

[a] O&M costs have not been estimated
[b] O&M costs for Phase 1 and Phase 2 of the Agricultural Recycled Water Expansion have been combined
[c] Estimate from Section 4.4 of Brown and Caldwell, 2017

SOURCE: Brown and Caldwell, 2017. Unless otherwise noted, cost estimates are from Section 5.

The workers employed as a result of the Proposed Action would earn wages and salaries and would likely spend a portion of wages and salaries within the project area. Workers who live within the project area would generate greater regional economic benefits than workers from outside the project area because a greater portion of their re-spending would occur within the regional economy. Marin, Napa, and Sonoma counties would likely supply a portion of the workers for the project and others would originate in the greater Bay Area region or Sacramento region. Construction details for the Proposed Action and alternatives, including number of workers needed and construction schedule, have not yet been identified. Therefore, the direct economic effects specific to project construction expenditures cannot be calculated for this analysis. However, it can be assumed that a portion of construction worker wages would be spent on goods and services in the project area, which would result in regional economic benefits. The Proposed Action and alternatives would result in a temporary economic benefit to the region that would end when construction is complete.

Project operation would result in beneficial regional economic effects. These effects would be long-term, but much smaller in magnitude than the economic effects from construction. Total annual operation and maintenance costs under the Proposed Action are estimated at approximately $1.3 million, which would primarily be associated with power requirements. Current member agency staff would perform most operation and maintenance-related tasks; however, the cost estimates do include some additional labor to maintain and repair pipelines and facilities. Therefore, the expenditures would likely not create numerous additional jobs in the region, but could create a small number and/or provide opportunities for additional work hours for current staff (e.g., part-time staff). The regional economic effects from operational expenditures would be beneficial, but minor.

Program Elements

The six Program Elements would have a total capital cost of approximately $49 million and an annual operation and maintenance cost of approximately $0.4 million. These elements would result in the same types of beneficial regional economic effects described for the Proposed Action, but to a lesser degree due to the smaller overall cost.

Storage Alternative

The Storage Alternative elements add approximately $57.6 million in capital cost and $0.58 in annual operations and maintenance costs. This would bring the total capital cost of the Storage Alternative to approximately $125.6 million and an annual operation and maintenance cost of approximately $1.84 million (see **Table 3.19-8**). These elements would result in the same types of beneficial regional economic effects described for the Proposed Action, but to a greater extent due to the increased overall cost.

TABLE 3.19-8: ESTIMATES OF PROJECT CAPITAL COSTS, NBWRP PHASE 2 STORAGE ALTERNATIVE

Agency	Projects	Capital Costs (millions)	Annual Operation and Maintenance Costs (millions)
Proposed Action			
Novato SD	RWF Treatment Capacity Expansion	$4.8	$0.19
	Marin County Lower Novato Creek Project 1 - Distribution	$0.9	-- [a]
	Turnout to Wetlands	$0.6	$0.02
SVCSD	Napa Road Pipeline	$3.6	$0.03
MMWD	San Quentin Prison Recycled Water Distribution System	$7.8	$0.06
Napa SD	Soscol WRF Increased Filter Capacity	$2.2	$0.27
	Soscol WRF Covered Storage	$2.9	$0.04
Petaluma	Ellis Creek WRF Increased Capacity	$9.0	$0.36
	Urban Recycled Water Expansion	$14.0	$0.06
	Agricultural Recycled Water Expansion – Phase 1	$4.3	$0.07
	Agricultural Recycled Water Expansion – Phase 2	$5.9	--[b]
American Canyon	Recycled Water Distribution System Expansion – Phase 1	$3.1	$0.03
	Recycled Water Distribution System Expansion – Phase 2	$2.9	$0.03
	WRF Phase 2 Treatment Plant Upgrades	$6.0	$0.10
Storage Alternative			
Novato SD	RWF Treatment Capacity 2nd Expansion	$4.8	$0.19
	Seasonal Storage – SR 37	$5.7	$0.07
Petaluma	Site Southeast of Ellis Creek WRF	$14.3	$0.09
Napa SD	Jameson Ranch Site	$18.7	$0.12
	MST Northern and Eastern Loop	$11.7	$0.08
SVCSD	Seasonal Storage – Mulas Site	$2.4	$0.03
	Storage Alternative Total	**$125.6**	**$1.84**

NOTES: RWF = Recycled Water Facility WRF = Water Reclamation Facility
ASR = Aquifer Storage and Recovery

[a] O&M costs have not been estimated
[b] O&M costs for Phase 1 and Phase 2 of the Agricultural Recycled Water Expansion have been combined

SOURCE: Brown and Caldwell, 2017. Unless otherwise noted, cost estimates are from Section 5.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.19.2: Project implementation could affect the agricultural economy. (Less than Significant)

No Project/No Action Alternative

Under the No Project Alternative, **no impact** would occur.

Under the No Action Alternative, none of these elements are proposed explicitly to provide recycled water to agricultural customers. Therefore, the No Action Alternative is expected to provide no change in the availability of recycled water on the NBWRP Phase 2 area. Therefore, there would be **no impact**.

Proposed Action

The Proposed Action would provide recycled water supplies to agricultural users that could replace surface or groundwater supplies. The *NBWRP Phase 2 Feasibility Report* (Brown and Caldwell, 2017) evaluated the economic impact of providing recycled water for agricultural use by comparing NBWRA Phase 2 costs to the costs of a feasible non-recycling project that would provide similar water supplies. If the NBWRP Phase 2 costs are lower than the non-recycled water supply costs, the NBWRP Phase 2 elements were considered cost-effective and thus considered to provide a net economic water supply benefit to the region. Agricultural users would receive approximately 2,500 acre-feet per year (AFY) from the Proposed Action (including SVCSD, Napa SD, and Petaluma projects). The comparison of NBWRP Phase 2 annual costs[2] with the costs of other non-recycling alternatives demonstrated that the cost per acre-foot of water for non-recycled water projects is approximately 2.3 to 2.7 times the cost per acre-foot (AF) of recycled water from NBWRP Phase 2. Therefore, NBWRP Phase 2 is expected to have a beneficial effect on the agricultural economy in terms of cost-effectiveness of water deliveries for irrigation.

The Proposed Action would increase the reliability of water supplies for agricultural irrigation. It is expected that during dry years, or as population increases in the region, the use of recycled water for irrigation of landscape and crops would help reduce demand on existing potable water supplies and save that potable water for municipal users (Brown and Caldwell, 2017). Therefore, the Proposed Action is not expected to increase the number of irrigated acres of crops in the region, but would improve reliability for existing agricultural production. This increased reliability of water sources would assist farmers in long-term decision-making about planting permanent crops such as vineyards, which rely on annual water availability for long-term economic viability. This would be a moderate beneficial effect (**less than significant**).

Program Elements

Of the six Program Elements, only the Petaluma Agricultural Recycled Water Expansion Phase 3 is proposed explicitly to serve agricultural customers. Agricultural users would receive 860 AFY from this Program Element. A comparison of annual costs and water supply demonstrated that annual costs per acre-foot for non-recycling water projects are approximately 2.3 to 2.7 times the annual cost per acre-foot of recycled water from NBWRP Phase 2 (Brown and Caldwell, 2017). Therefore, the Program Elements are expected to have a beneficial effect on the agricultural economy in terms of cost-effectiveness of water deliveries for irrigation.

Storage Alternative

Of these Storage Alternative elements, all of them – with the exception of the Novato SD storage project – are proposed explicitly to serve agricultural customers. Agricultural users would receive 949 AFY of recycle water under the Storage Alternative. A comparison of annual costs and water supply demonstrated that annual costs per acre-foot for non-recycling water projects are approximately 2.3 to 2.7 times the annual cost per acre-foot of recycled water from NBWRP Phase 2 (Brown and Caldwell, 2017). Therefore, the Storage Alternative is expected to have a beneficial effect on the agricultural economy in terms of cost-effectiveness of water deliveries for irrigation.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.19.3: Impact to Winery-related Industry. Recycled water deliveries to vineyards would support the winery-related tourism industry. (Less than Significant)

No Project/No Action Alternative

Under the No Project Alternative, there would be **no impact**.

[2] The NBWRP Phase 2 Feasibility Report calculated annual costs by including annualized capital costs, annual O&M costs, and replacement or refurbishment costs for facilities with less than a 50-year life. These costs were then divided by the per year water benefits in order to find NBWRP Phase 2 costs per acre-foot.

Under the No Action Alternative, none of these elements are proposed explicitly to provide recycled water to agricultural customers, which would include vineyards. Therefore, the No Action Alternative is expected to provide no change in the availability of recycled water on the NBWRP Phase 2 area. Therefore, there would be **no impact**.

Proposed Action

Recycled water deliveries would provide a more reliable water supply for irrigation of existing vineyards in Napa and Sonoma counties, which would help maintain vineyard production in the long term. Reliability improvements would also provide long-term support for the winery-related tourism industry. This would be a minor beneficial impact (**less than significant**).

Program Elements

As indicated in the discussion of Impact 3.19.2 above, of the six Program Elements only the Petaluma Agricultural Recycled Water Expansion Phase 3 is proposed explicitly to serve agricultural customers. Agricultural users, some of which could be vineyards in the area, would receive 860 AFY from this Program Element which would help maintain vineyard production in the long term. Reliability improvements would also provide long-term support for the winery-related tourism industry. This would be a minor beneficial impact (**less than significant**).

Storage Alternative

Of these Storage Alternative elements, all of them – with the exception of the Novato SD storage project – proposed explicitly to serve agricultural customers. Agricultural users, some of which could be vineyards in the area, would receive 949 AFY from these Storage Alternative elements which would help maintain vineyard production in the long term. Reliability improvements would also provide long-term support for the winery-related tourism industry. This would be a minor beneficial impact (**less than significant**).

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.19.4: Increase in water/sewer charges. Project implementation could increase municipal and industrial customer water or sewer charges. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, other types of water supply projects may be developed to increase water supplies and reliability, and such projects may be more expensive to implement (Brown and Caldwell, 2017). Under future baseline (2035) conditions, water and sewer charges within the region are anticipated to increase and would occur in accordance with anticipated development allowed under the approved general plans within the region.

Like the Proposed Action, cost for the No Action Alternative would increase user fees in the service areas of those participating Member Agencies. However, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. However, the use of recycled water may have a beneficial effect on future water and sewer fees by postponing fee increases for development of other water sources. Any potential environmental justice effects on low-income populations are discussed in **Section 3.18, Environmental Justice**.

Proposed Action

Section 9.3 of the Feasibility Report for NBWRP Phase 2 indicates that "It is expected that any debt instruments (loans and bonds) acquired to fund construction would be repaid primarily through user fees, both for wastewater service and for recycled water supply deliveries. It is possible that rates for all users in the wastewater and water agencies, not just the users receiving the recycled water supply, could be raised for debt service of this project." The report also notes that annual operations and maintenance costs likely would be collected through user fees, as well (Brown and Caldwell, 2017). Therefore, it is assumed that NBWRP Phase 2 costs would increase user fees; however, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period

relative to fee increases. However, the use of recycled water may have a beneficial effect on future water and sewer fees by postponing fee increases for development of other water sources. Any potential environmental justice effects on low-income populations are discussed in **Section 3.18, Environmental Justice**.

Program Elements

Like the Proposed Action, cost for the Program Elements would increase user fees; however, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. However, the use of recycled water may have a beneficial effect on future water and sewer fees by postponing fee increases for development of other water sources. Any potential environmental justice effects on low-income populations are discussed in **Section 3.18, Environmental Justice**.

Storage Alternative

Like the Proposed Action, cost for the Storage Alternative would increase user fees; however, the extent of increase is not known at this time, in part because the terms of financing the non-federally-funded portions of construction costs cannot currently be known. While it is assumed that increased water and sewer fees would adversely affect the disposable personal incomes of customers in the Member Agencies' service areas, the extent to which customers may be financially affected would depend on several factors that cannot be known at this time, including the amount of federal funding obtained and the overall change in personal incomes during the build-out period relative to fee increases. However, the use of recycled water may have a beneficial effect on future water and sewer fees by postponing fee increases for development of other water sources. Any potential environmental justice effects on low-income populations are discussed in **Section 3.18, Environmental Justice**.

Mitigation Measures

None required.

Impact Significance: Less than Significant.

Impact 3.19.5: Impact on Recreational Spending. Recycled water deliveries that would enhance restoration areas could increase recreational spending in the region. (No Impact)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

No Action Alternative, the Turnout to Transitional Wetlands project component would likely be the only restoration-oriented component implemented. However, as described for NBWRP Phase 2, this project would not increase recreational spending in the region. **No impact** would occur.

Proposed Action

As described in **Section 3.15, Recreation**, the upgrades proposed at the Novato SD Recycled Water Facility (RWF) would enable the provision of recycled water to the Lower Novato Creek Watershed Program, which involves tidal marsh habitat restoration, potentially enhancing recreational opportunities off-site, and the wetlands enhancements associated with the Turnout to Transitional Wetlands may result in improved recreational bird watching. However, it is unlikely that such enhancements would increase recreational spending in the region because the improvements would not change the overall nature of these recreational amenities such that more visitors would be attracted to visit them. **No impact** would occur.

Program Elements

The Marin County Lower Novato Creek Project – Restoration is a series of five projects which would remove levees and other tidal impediments to along Novato Creek east of the Sonoma-Marin Area Rail Transit (SMART)/Northwest Pacific Railroad bridge. This tidal marsh habitat restoration, potentially enhancing recreational opportunities off-site, may result in improved recreational bird watching. However, it is unlikely that such enhancements would increase recreational spending in the region because the improvements would not change the overall nature of these recreational amenities such that more visitors would be attracted to visit them. **No impact** would occur.

Storage Alternative

Like the Proposed Action, the upgrades proposed at the Novato SD recycled water facility would enable the provision of recycled water to the Lower Novato Creek Watershed Program which involves tidal marsh habitat restoration, potentially enhancing

recreational opportunities off-site, and the wetlands enhancements associated with the Turnout to Transitional Wetlands may result in improved recreational bird watching. However, it is unlikely that such enhancements would increase recreational spending in the region because the improvements would not change the overall nature of these recreational amenities such that more visitors would be attracted to visit them. **No impact** would occur.

Mitigation Measures

None required.

Impact Significance: No Impact.

3.19.3.4 Socioeconomics

Appendix 3.19B provides a summary of potential Project impacts per Member Agency related to socioeconomic.

CHAPTER 4
Cumulative Impacts

4.1 CEQA Analysis Requirements

The National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require the analysis of cumulative impacts. A cumulative impact is created as a result of the combination of the project evaluated in the EIR/EIS together with other projects causing related impacts. NEPA and the Council on Environmental Quality (CEQ) regulations require an assessment of cumulative impacts, in addition to the evaluation of direct impacts (40 CFR 1508.7 and 1508.25, 43 CFR 46.115). CEQ regulations implementing NEPA define a cumulative impact as:

> ". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The *CEQA Guidelines* require that EIRs discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable," meaning that the project's incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects.[1] The purpose of this analysis is to disclose significant cumulative impacts resulting from the NBWRP Phase 2 in combination with other projects or conditions, and to indicate the severity of the impacts and the likelihood of occurrence (CEQA Guidelines Sections 15130 (a) and (b)). The *CEQA Guidelines* indicate that the discussion of cumulative impacts should include:

(1) Either: (A), a list of past, present, and probable future projects producing related or cumulative impacts; or (B), a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, which described or evaluated conditions contributing to a cumulative impact;

(2) A discussion of the geographic scope of the area affected by the cumulative effect;

(3) A summary of expected environmental effects to be produced by these projects; and,

(4) Reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The analysis of cumulative impacts in this chapter focuses on the potential impacts of concurrent implementation of NBWRP Phase 2 with other spatially and temporally proximate projects, as well as water management projects.

4.2 Related Projects

4.2.1 Geographic Scope

The potential for project-generated impacts to contribute to a significant cumulative impact would arise if they are located within the same geographic area. This geographic area may vary, depending upon the issue area discussed and the geographic extent of the potential impact. For example the geographic area associated with construction noise impacts would be limited to areas directly affected by construction noise, whereas the geographic area that could be affected by construction-related air emissions may include a larger area. In general, impacts associated with the implementation of NBWRP Phase 2 are limited to short-term, temporary and localized construction impacts. Long-term impacts are limited to beneficial impacts to water supply and energy use associated with recycled water treatment and distribution.

Construction impacts associated with aesthetics, increased noise, dust, erosion, and access limitations tend to be localized and could be exacerbated if other development or improvement projects are occurring within the vicinity of proposed facilities. The geographic scope may vary for each issue area depending on the nature of the cumulative impacts. When considered cumulatively with other projects that may occur in the same geographic vicinity, the scope of analysis is defined by the physical boundaries for each issue area. Therefore, cumulative impacts to water quality would occur within the watershed. For this cumulative analysis,

[1] CEQA *Guidelines* Sections 15130, 15065, as amended January 1, 2000.

the two geographic boundaries that capture the majority of these impacts are the North San Pablo Bay watershed and the Bay Area Air Basin. Where appropriate, other jurisdictional boundaries are applied for individual issue area analysis.

4.2.2 Project Timing

In addition to the geographic scope, cumulative impacts are determined by timing of the other projects relative to the proposed project. Schedule is particularly important for construction-related impacts. For a group of projects to generate cumulative construction impacts, they must be temporally as well as spatially proximate. The projects described in **Sections 4.2.3** and **4.2.4** are likely to fluctuate due to schedule changes of other unknown factors, this analysis assumes these projects would be implemented concurrently with implementation of NBWRP Phase 2.

4.2.3 Relationship to Water Supply Projects Occurring Outside of the North San Pablo Bay Watershed

As noted throughout this EIR/EIS, water supply within the North San Pablo Bay watershed is provided by three primary sources: water supply imported from outside of the watershed, local surface water diverted within the watershed, and groundwater. Imported supplies include supplies imported from the Russian River (including a portion diverted from the Eel River watershed by PG&E's Potter Valley Project) and distributed within Sonoma and Marin Counties by Sonoma County Water Agency (SCWA), and supplies imported from the Sacramento-San Joaquin Delta and delivered to Napa County by the California Department of Water Resources. A number of projects that have potential to affect the amount, timing, availability, quality, and management of imported water supplies have or will be proposed, and may be implemented outside of the North San Pablo Bay Watershed. The objectives of the NBWRP Phase 2 are identified in **Chapter 2**. NBWRP Phase 2 would recover[2] wastewater that is currently discharged to North San Pablo Bay, and reuse that water for urban and agricultural irrigation in order to offset the use of potable supplies for this purpose. The level of potential potable offset is identified in **Section 3.2, Groundwater, Section 3.3 Water Quality**, and **Section 3.12, Public Utilities**. The NBWRP Phase 2's only contribution to impacts related to the provision of imported surface water supplies is beneficial, as the provision of recycled water would offset use of potable supplies for irrigation.

4.2.4 Type of Projects Considered

As described in **Chapter 3** of this EIR/EIS, the majority of impacts associated with implementation of the proposed NBWRP Phase 2 are short-term impacts related to construction of the proposed facilities, rather than long-term project operation. Therefore, cumulative effects will primarily result from potential combined impacts of other construction projects in Sonoma, Napa, and Marin Counties. For this analysis, other past, present, and reasonably-foreseeable future construction projects, particularly other infrastructure projects, in the area have been identified and summarized in **Table 4-1** found in **Appendix 4**. Water and wastewater management projects within the region that, along with implementation of NBWRP Phase 2, could potentially contribute to cumulative impacts within the project area are identified in **Table 4-2,** and discussed in **Section 4.2.5**. In addition to specific projects identified in **Tables 4-1 and 4-2**, it is recognized that additional construction development will occur within the NBWRP Phase 2 area and may contribute to cumulative construction impacts. Such planned and approved development is in accordance with the General Plans for Sonoma County, Napa County, and Marin County and the Cities of American Canyon, Sonoma, Napa, San Rafael, Petaluma, and Novato. The growth inducement potential of NBWRP Phase 2 and the secondary effects of accommodating planned growth within the NBWRP Phase 2 area are discussed separately in **Chapter 5**.

4.2.5 Description of Cumulative Projects

A discussion of individual water service and water recycling projects considered in the Sonoma, Napa, and Marin County areas, and their anticipated environmental impacts is provided in **Appendix 4**. **Table 4-2** below provides a summary of these projects, their geographic relationship to the NBWRP Phase 2 service areas, the types of impacts anticipated for their implementation, and the potential for the NBWRP Phase 2 to contribute to cumulative impacts associated with these projects.

[2] It should be noted that the recovery of recycled water occurs only after the use of potable water, generation of wastewater through municipal, commercial, and industrial and irrigation uses, and the subsequent treatment of that wastewater to levels appropriate for release to the environment as treated effluent, consistent with NPDES permit requirements. Recovery of treated effluent prior to discharge, and reuse of that effluent for irrigation purposes, would not increase or alter the amount, rate, or distribution of water imported into the area to support existing and future water demands under the approved General Plans within the NBWRP area. Rather, it would offset the use of potable supplies for irrigation.

TABLE 4-2: SUMMARY OF OTHER WATER RESOURCE PROJECTS AND RELATIONSHIP TO NBWRP PHASE 2

	Project Impacts	North San Pablo Watershed?	Bay Area Airshed?[1]	Imported Surface Water Supply Source		NBWRP Phase 2 Contribution?	NBWRP Phase 2 Contribution Type	NBWRP Phase 2 Contribution Considerable?	NBWRP Phase 2 Contribution Cumulatively Significant?
				Russian River	State Water Project				
General Plan Development	Construction	Yes	Yes	Marin Sonoma	Napa	Yes	Construction Water Supply GHG Emissions	No No, Beneficial No	No No No
General Plan Infrastructure	Construction Operations	Yes	Yes	Marin Sonoma	Napa	Yes	Construction Water Supply GHG Emissions	No No, Beneficial No	No No No
WATER RESOURCE PROJECTS									
Marin County Projects									
Bel Marin Keys Phase 1	Construction	Yes	Yes	X	--	Yes	Construction GHG Emissions	No No	No No
MMWD Desalination	Construction Operations	Yes	Yes	X	--	Yes	Construction Water Supply GHG Emissions	No No, Beneficial No	No No No
Sonoma County Projects									
Fish Habitat Flows and Water Rights Project EIR.	Operations	No	Yes	X	--	Yes	Water Supply GHG Emissions	No, Beneficial No	No No
Eel River and Potter Valley Project	Operations	No	No	X	--	Yes	Water Supply	No, Beneficial	No
City of Santa Rosa Subregional Urban Water Reuse System	Construction Operations	No	Yes	X	--	Yes	Construction Water Supply GHG Emissions	No No, Beneficial No	No No No
Sonoma Valley Groundwater Management Plan	Operations	Yes	Yes	X	--	Yes	Water Supply GHG Emissions	No, Beneficial No	No No
Napa County Projects									
North Bay Aqueduct	Construction Operations	No	Yes	X	--	Yes	Water Supply GHG Emissions	No, Beneficial No	No No
Regulatory and Other Cumulative Projects									
North Coast IRWMP	Construction Operations	No	No	X	--	Yes	Water Supply	No, Beneficial	No
San Francisco IRWMP	Construction Operations	Yes	Yes	X	--	Yes	Construction Water Supply	No No, Beneficial	No No
303(d) Listing of Waterways	Construction Operations	Yes	Yes		--	Yes	Water Quality	No	No

NOTE:

[1] The term "airshed" is defined by the Bay Area Air Quality Management District (BAAQMD) as a geographical area of which, because of topography, meteorology, and climate, shares the same air. For analysis of the NBWRP, airshed refers to all areas that share the same air within the project area. This term is an applicable in the analysis of cumulative impacts on air quality as a result of concurrent construction or operation of projects within the same spatial and temporal locations.

4.3 Description of Cumulative Effects

This section reviews the potential cumulative effects of constructing the NBWRP Phase 2 elements concurrently with other Sonoma, Napa, and Marin County projects. Additionally, the geographic scope of potential cumulative impacts varies by issue area and is defined below. Since the alternatives represent incremental development of recycled water facilities, the cumulative impact analysis is based on the "worst case scenario" of all of the increments combined. For example, the cumulative impacts associated with construction will increase incrementally with each alternative.

4.3.1 Construction Related Impacts

Impacts 4-1: Construction-related Cumulative Impacts. Concurrent construction of several projects within the Sonoma, Napa, and Marin County areas could result in cumulative short-term impacts associated with construction activities. If implemented at the same time as other construction projects, construction of facilities could contribute to potential short-term cumulative effects associated with erosion, cultural resource disturbance, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, aesthetics, air quality, biological resources, hazardous materials, water quality, public services and utilities. However, construction-related impacts would not result in long term alteration of the environment, and could be mitigated to less than significant levels through the use of mitigation measures identified throughout Chapter 3. (*Less than Significant with Mitigation*)

Construction of the specific facilities under the selected alternative would potentially coincide with other proposed infrastructure projects in the NBWRP Phase 2 area. Due to their short-term nature, and the inclusion of appropriate mitigation measures as established in Chapter 3.0, the NBWRP Phase 2's contribution to cumulative impacts is not considerable. The following discussion reviews construction related impacts and the potential cumulative contribution of both the Proposed Action and the other projects identified within the Sonoma, Napa, Marin County area.

Water Quality

Concurrent construction of the NBWRP Phase 2 elements with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in increased erosion and subsequent sedimentation and stormwater pollution, with impacts to water quality in downstream water bodies and/or storm drain capacity. In particular, degradation of surface waters could result from construction activities, including construction of pipelines, pump stations, storage, and treatment facility improvements. Additionally, discharge of groundwater, release of fuels, or release of other hazardous materials associated with construction activities could degrade water quality.

The SWRCB has issued a General NPDES Permit to address potential impacts related to construction activities. This Construction General Permit has been issued to ensure that individual projects implement its fair share of mitigation measures designed to alleviate cumulative impacts to water quality. The Construction General Permit mandates that projects disturbing 1.0 acre or more of ground surface develop and implement a Storm Water Pollution Prevention Plan (SWPPP) identifying BMPs to reduce erosion of disturbed soils and release of hazardous materials into water courses. Preparation of the SWPPP and compliance with the measures identified in the SWPPP would ensure compliance with state regulatory policies to minimize the potential for water quality impacts from construction activities associated with the proposed project. As such, the potential contribution to water quality impacts associated with the proposed project would be rendered less than cumulatively considerable through implementation of implementation of **Measure 3.5-1a** as identified in **Section 3.5**, **Water Quality**.

Biological Resources

Concurrent construction of NBWRP Phase 2 elements with other projects proposed in the Sonoma, Napa, and Marin county area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** could result in temporary impacts to biological resources in the project area. Potential impacts during construction include temporary disturbance and/or permanent loss of wetlands and waters under regulatory jurisdiction of the USACE (CWA Section 404), RWQCB (CWA Section 401), and CDFW (Fish and Game Code Section 1601-1616). These impacts are limited to areas along the recycled water pipelines, proposed storage reservoir sites, and outfalls/turnouts. Potential jurisdictional features are identified in **Section 3.6, Biological Resources**.

Impacts to western pond turtle, California red-legged frog, Chinook, and steelhead could occur during construction operations. Construction could also temporarily impact nesting habitat for golden eagle and Swainson's hawk. Additional impacts due to construction would affect common plant and animal species. All of these impacts will be mitigated to a less than significant level upon project completion by the implementation of mitigation measures in **Section 3.6**, **Biological Resources**. As such, the NBWRP Phase 2's contribution to short-term impacts to biological resources is not cumulatively considerable.

Land Use and Agricultural Resources

This section presents an analysis of the cumulative effects of the NBWRP Phase 2 in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively considerable impacts. These projects are listed in **Table 4.1**, with other water and wastewater infrastructure projects identified in **Section 4.2.4**.

As discussed in **Section 3.7**, the NBWRP Phase 2 would have no impact with respect to the division of an existing community. Accordingly, it would not contribute to cumulative impacts related to the division of existing communities.

The analysis in **Section 3.7** concludes that NBWRP Phase 2 would have no impact with respect to conflicts with existing land use plans and policies. The elements proposed under the NBWRP Phase 2 would generally be consistent with goals and policies identified in the relevant general plans related to community development, resource conservation, and agriculture. The NBWRP Phase 2 includes facility improvement projects, installation of pipelines, construction of pump stations and the construction of new and the rehabilitation of existing reclaimed water storage reservoirs. Although construction of some of these facilities would result in impacts on air quality and natural resources, on the whole NBWRP Phase 2 would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region. NBWRP Phase 2, concurrent with other projects in Sonoma, Napa, and Marin counties, and other water and wastewater infrastructure projects occurring within the North San Pablo Bay Watershed, could potentially contribute to cumulative impacts with respect to conflict with adopted plans and policies; however, this would not be cumulatively considerable.

NBWRP Phase 2 elements would be constructed and operated within existing treatment facilities, roadways, or other developed areas. It would not impact the agricultural use of important farmland. Therefore, the NBWRP Phase 2, concurrent with other projects with Sonoma, Napa, and Marin counties, and other water and wastewater infrastructure projects occurring within the North San Pablo Bay Watershed, would not constitute a considerable contribution to cumulative impacts with respect to construction-related impacts to Important Farmland and conversion of farmland.

Transportation and Traffic

Concurrent construction of elements of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin county area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** would intermittently and temporarily generate increases in: vehicle trips by construction workers and construction vehicles on area roadways, traffic delays, and potential traffic safety hazards for vehicles, bicyclists and pedestrians on public roadways. Construction may temporarily restrict access for general traffic and emergency vehicles, would increase parking demands in the vicinity of the project and may cause permanent damage to road pavement. Construction-related impacts to traffic associated with the NBWRP Phase 2 elements would be short-term. As identified in **Section 3.8, Transportation and Traffic**, proposed pipeline routes may directly overlap with projects that would occur along roadways identified in **Table 4-1**, including roadway improvements proposed by Sonoma County (Lakeville Highway striping) and American Canyon (SR 29, various roadways).

As noted in **Section 3.8**, this level of short-term construction would not be considered significant on a project basis and implementation of mitigation measures required in the section, including preparation of a Traffic Control Plan, would reduce potential impacts to a less than significant level. Due to the rate of pipeline construction, impacts at any one location are short term. With the inclusion of appropriate mitigation measures, NBWRP Phase 2's contribution to construction traffic impacts would not be cumulatively considerable.

Air Quality

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** would generate short-term emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. The project could also generate greenhouse gas (GHG) emissions; including those associated with construction equipment, increases in vehicle traffic, and secondary operational increases resulting from electricity use would overlap with similar sources of GHG emissions from other projects. These potential impacts contribute to overall impacts to the San Francisco Bay Area Air Basin in which the project is located. As described in Section 3.8, Air Quality, the Bay Area air basin is classified as non-attainment for State PM10 and PM2.5[3] standards as well as State 1- and 8-hour ozone standards. With respect to federal standards, the Bay Area Air Quality Management District (BAAQMD) is classified as marginal non-attainment for the 8-hour ozone standard. which is treated as a significant cumulative impact for purposes of this analysis. However, as discussed below and in Section 3.8 Air Quality, increases in air pollutant and GHG emissions from these sources associated with NBWRP Phase 2 projects would be minimal, and the contribution from NBWRP Phase 2 would not result in a significant increase in cumulative GHG emissions.

Project construction would generate particulate matter and other criteria pollutants, primarily through excavation activities, construction equipment exhaust, haul truck trips, and related construction worker commute trips. This impact would be temporary on a local level, lasting through the duration of the project. Construction activities for this project would occur in the immediate vicinity of the facility site under excavation at a given time. As indicated above, emissions from construction vehicles will potentially impact nearby residential uses. Regionally, emissions resulting from vehicles associated with the project would incrementally add to regional atmospheric loading of ozone precursors during the short-term construction period. BAAQMD Guidelines recognize that construction equipment emits ozone precursors, but indicate that such emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1999). Similarly, mitigation will be required to control respirable particulate matter (PM10)

[3] Particulate matter that have a size 10 microns and 2.5 microns.

emissions rendering their impacts less than significant. As the District's emissions inventory and associated regional air quality plan account for construction-related emissions of criteria pollutants, they are not expected to impede attainment or maintenance of ozone or carbon monoxide standards in the Bay Area. As such, the potential contribution to air quality impacts associated with the Project would be rendered less than cumulatively considerable through implementation of **Measures 3.9-1a and 3.9-1b** identified in **Section 3.9, Air Quality**.

Noise

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** would generate short-term noise associated with construction equipment and construction traffic. Construction activities are anticipated to temporarily and intermittently raise noise levels above ambient levels. With implementation of mitigation measures identified in **Section 3.11, Noise** the proposed project's contribution to noise impacts would be rendered less than cumulatively considerable.

Public Services and Utilities

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** could result in temporary, planned or accidental disruption to utility services, and require short-term police and fire protection services to assist in traffic management or in the event of an accident. No effects to utility customer service are anticipated; therefore, the proposed project would not contribute to cumulative effects related to utilities.

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** would have the potential to contribute to service demands for police and fire services in the event of an accident. For the NBWRP Phase 2, this need would be limited to safety inspection and fire-suppression during construction. Construction of the recycled water pipelines would be primarily limited to existing right-of-way, but could involve temporary road closures, lane closures, and other traffic controls that could interfere with an adopted emergency response plan or emergency evacuation plan. No long-term public service needs would be associated with project implementation, and no permanent road closures would be required. Implementation of mitigation measures in **Section 3.13, Public Services and Utilities**, would reduce impacts to utilities and emergency service providers to less than significant. As such, the NBWRP Phase 2's contribution to the potential for disruption to public services is not considered cumulatively considerable.

Hazardous Materials

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** could result in an increase in risk of exposure (human and the environmental) to hazardous materials, including through excavation, spills or releases. As identified in **Section 3.12, Hazardous Materials**, this potential is considered low, given review of available information and existing land uses along the pipeline corridor and at facility site locations. Implementation of mitigation measures in **Section 3.12, Hazardous Materials**, will reduce potential impacts to a less than significant level on a project basis. As such, the NBWRP Phase 2's contribution to the potential for disturbance of hazardous materials is not considered cumulatively considerable.

Aesthetics

Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area (**Table 4-1**) and other water and wastewater infrastructure projects identified in **Section 4.2.4** located within the same viewsheds would result in short-term visual impacts during construction. Construction activities would require the use of heavy equipment and storage of materials at the construction zone. During construction, excavated trenches and stockpiled soils, pipe, and other materials within the construction easement would constitute negative aesthetic elements in the visual landscape that would directly affect the area. The NBWRP Phase 2 would result in the temporary disturbance of views along roadways and of agricultural fields during pipeline construction

Excavated trenches, stockpiled soil, and other materials within the construction area would constitute negative aesthetic elements in the visual landscape. As noted in **Section 3.16, Aesthetics**, these impacts would be temporary during project construction, and would not be considered significant on a project basis. Following construction, the recycled water pipelines would be located entirely below-ground and would be visually unobtrusive. Pumping stations would be located below grade to the degree feasible, and integrated with the surrounding visual character. Improvements to provide tertiary treatment and storage would occur onsite at existing WWTPs, and would not alter the existing visual character of those facilities. Disturbed areas will be restored to their previous state upon project completion. Due to the limited nature of these improvements, views from residential areas and recreational facilities would not be adversely affected. Implementation of **Measure 3.16-1a** would reduce long-term visual impacts to less-than-significant levels. As such, the NBWRP Phase 2's contribution to the potential for disruption to visual resources and is not considered cumulatively considerable.

Mitigation Measures

Mitigation Measure 4.1: Member Agencies shall coordinate construction activities along selected alignments to identify overlapping pipeline routes, project areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts.

Impact Significance after Mitigation: Less than Significant after Mitigation

4.3.2 Long-Term Impacts

Impact 4.2: Cumulative Long-term Impacts resulting from Seismic Events. Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term risk of upset impacts related to groundshaking and surface fault rupture during major earthquakes. (Less than Significant)

Components of the NBWRP Phase 2 could be exposed to damage from earthquakes and geologic hazards. In the event of a catastrophic failure, areas downstream of pipelines or storage facilities could experience localized flooding. Groundshaking and surface fault rupture during major earthquakes on nearby active faults could cause structural damage or collapse of facilities. Ground failure, including slope failure, differential settlement, loss of bearing strength, could occur beneath facilities, resulting in structural or mechanical damage and secondary effects related to recycled water release.

The project area is situated along the Rodgers Creek Fault, which is anticipated to experience significant seismic activity by 2032 (Rodgers, 2006). Failure of facilities that are built as part of the NBWRP Phase 2, in conjunction with the failure of other projects in the area, could result in potential disruptions to irrigation supplies. Considering that geohazards are unavoidable and unpredictable, NBWRP Phase 2 facilities would be exposed to damage from earthquakes and geologic hazards. Implementation of standard design criteria and appropriate design measures, would reduce this impact to less than significant. Therefore, the NBWRP Phase 2's contribution to this impact would not be cumulatively considerable.

Mitigation Measures

No mitigation measures are required.

Impact 4.3: Cumulative Long-term Impacts on Water Resources. Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to water resources, water quality, and flooding. (*Less than Significant*)

Construction of the NBWRP Phase 2, concurrent with other projects with Sonoma, Napa, and Marin Counties, and other water and wastewater infrastructure projects occurring within the North San Pablo Bay Watershed, would potentially contribute to surface water, water quality, and flooding impacts due to alterations of drainage patterns and increases in impervious surface areas. Increases in impervious surface area would be limited to treatment facilities and pump stations at existing WWTPs, which would be integrated into existing drainage infrastructure. Pump stations located along proposed pipeline routes would be limited to 1,000 square feet per facility. These facilities would not substantially contribute to runoff within the watershed during storm events. Therefore, the NBWRP Phase 2's contribution to cumulative impacts to water resources, water quality, and flooding are not cumulatively considerable.

Implementation of the NBWRP Phase 2 would reduce the amount of treated effluent discharged to tributary to the North San Pablo Watershed. This would have an incremental, but beneficial cumulative impact on water quality in receiving waters.

Implementation of the NBWRP Phase 2 would offset the use of potable water supplies for irrigation, including imported surface water supplies, groundwater, and local surface water supplies. This would have a beneficial cumulative impact on water supply.

Mitigation Measures

No mitigation measures are required.

Impact 4.4: Cumulative Long-term Impacts on Groundwater. Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to groundwater resources and groundwater quality. (Less than Significant)

Construction of the NBWRP Phase 2, concurrent with other projects with Sonoma, Napa, and Marin Counties, and other water and wastewater infrastructure projects occurring within the North San Pablo Bay Watershed, would potentially contribute to alterations in groundwater due to increases in impervious surface areas and offset of groundwater supplies used for irrigation. Increases in impervious surface area would be limited to treatment facilities and pump stations at existing WWTPs, which would be integrated into existing drainage infrastructure. Pump stations located along proposed pipeline routes would be limited to 1,000 square feet per facility. These facilities would not substantially alter groundwater recharge areas. Therefore, the NBWRP Phase 2's contribution to cumulative impacts to groundwater recharge are not significant.

Implementation of the NBWRP Phase 2would offset the use of potable water supplies for irrigation, including imported surface water supplies, groundwater, and local surface water supplies. As identified in **Section 3.4, Groundwater Resources,** this would have a beneficial cumulative impact on groundwater pumping, particularly in the MST Area and Sonoma Valley.

Mitigation Measures

No mitigation measures are required.

Impact 4.5: Cumulative Long-term Impacts on Biological Resources. Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area, and other water and wastewater infrastructure projects, could result in cumulative long-term impacts to biological resources. (Less than Significant with Mitigation)

Wetland Habitat

The NBWRP Phase 2 would have the potential to impact 36 drainages; however, pipeline crossings would use trenchless technology to minimize impacts to wetland features. Implementation of projects within the North San Pablo Bay Watershed would have the potential to impact wetland features. These project have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset loss of wetlands and sensitive habitats.

As required by **Measure 3.6-1**, design measures would be incorporated to avoid wetland impacts the extent feasible, either through avoidance or through use of trenchless technology. As necessary, compensatory mitigation would be established as part of the USACE 404 Permit and CDFG 1600 permitting processes. Due to the limited wetland loss, and the mitigation measures established in **Section 3.6, Biological Resources**, the contribution of the NBWRP Phase 2 to wetland loss would be rendered less than cumulatively considerable.

Special Status Fish and California Freshwater Shrimp

As noted above, implementation of the NBWRP Phase 2 would have the potential to affect 36 drainages, with potential impacts to special-status fish species and California freshwater shrimp. Construction of facilities could affect special-status invertebrate or fish species including steelhead, Chinook salmon, California freshwater shrimp, other special-status shrimp, or designated critical habitat for steelhead. As noted above, **Measure 3.6-2** requires that design measures be incorporated to avoid wetland impacts the extent feasible, either through avoidance or through use of trenchless technology. Therefore, it is anticipated that temporary impacts to habitat for these species at stream crossings would be avoided. As necessary, compensatory mitigation would be established as part of the USACE 404 Permit and CDFW 1600 permitting processes. Due to the limited impacts to stream crossings, and the mitigation measures established in **Section 3.6, Biological Resources**, the contribution of the NBWRP Phase 2 to temporary impacts to sensitive fish species, sensitive invertebrate species and California freshwater shrimp would be rendered less than cumulatively considerable.

Long-term operation impacts of the NBWRP Phase 2 would include the reduction of treated effluent discharge into tributaries of North San Pablo Bay. When considered with other discharge inputs into North San Pablo Bay, both from point and non-point sources, this is anticipated to have an incremental, but beneficial, impact to water quality and sensitive species habitat. Therefore, the NBWRP Phase 2's contribution to cumulative impacts to sensitive fish species, special status invertebrate species, and California freshwater shrimp habitat is less than significant.

CRLF and Western Pond Turtle

As noted above, implementation of the NBWRP Phase 2 would have the potential to affect 36 drainages, with potential impacts to California red-legged frog and western pond turtle upland and aquatic habitats. As noted above, **Measure 3.6-3** requires that

design measures be incorporated to avoid wetland impacts the extent feasible, either through avoidance or through use of trenchless technology. Therefore, it is anticipated that temporary impacts to habitat for these species at stream crossings would be avoided. As necessary, compensatory mitigation would be established as part of the USACE 404 Permit and CDFW 1600 permitting processes. Due to the limited impacts to stream crossings, and the mitigation measures established in **Section 3.6, Biological Resources**, the contribution of the NBWRP Phase 2 to temporary impacts to California red-legged frog and western pond turtle upland and aquatic habitats species, would be rendered less than cumulatively considerable.

Sensitive Marsh Bird and Burrowing Owl

Construction of pipelines would have the potential for short-term construction related impacts to sensitive marsh birds, burrowing owls and other nesting birds. The burrowing owl is a federal Species of Concern and California Species of Special Concern, and use grassland areas with ground squirrel burrow associations. NBWRP Phase 2 pipelines would have the potential to impact habitats used by burrowing owls. Facility construction would also have the potential to temporarily impact raptors and nesting birds protected under the California Fish and Game Code and the federal Migratory Bird Treaty Act. Implementation of **Mitigation Measure 3.6.4** established in **Section 3.6 Biological Resources**, which includes avoidance of the nesting season (February 1 through September 14), minimization of impact area, pre-construction survey, construction crew training, and construction monitoring, would reduce potential impacts to sensitive marsh bird species to a less than significant level.

Other projects within the North San Pablo Watershed could also contribute to disruption or loss of habitat, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset loss of habitat. Due to the limited potential NBWRP Phase 2's temporary impacts, and the mitigation measures established in **Section 3.6**, **Biological Resources**, the contribution of the NBWRP Phase 2 to impacts to burrowing owl, raptors, and nesting birds protected under the California Fish and Game Code and the Migratory Bird Treaty Act would be rendered less than cumulatively considerable.

Sensitive Mammal Species

Construction of pipelines would have the potential for short-term construction related impacts to salt marsh harvest mouse, Suisun ornate shrew, and roosting or breeding bats. Implementation of **Mitigation Measure 3.6.5** established in **Section 3.6 Biological Resources**, which includes pre-construction survey, minimization of the construction area, establishment of exclusion fencing, clearance of the construction area though pre-construction trapping and relocation of salt marsh harvest mice and ornate shrew individuals, construction crew training, and construction monitoring, would reduce potential impacts to a less than significant level.

The NBWRP Phase 2 has the potential to impact habitat for sensitive bat species, primarily at bridge crossings of streams which can occur along pipeline routes and facility locations. Implementation of **Mitigation Measure 3.6.5** established in **Section 3.6 Biological Resources**, which includes pre-construction survey and avoidance of roosts, would reduce potential impacts to sensitive bat species to a less than significant level.

Other projects within the North San Pablo Watershed could also contribute to disruption or loss of sensitive bat species or salt marsh harvest mouse, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset loss of habitat. Due to the limited potential NBWRP Phase 2's temporary impacts, and the mitigation measures established in **Section 3.6**, **Biological Resources**, the contribution of the NBWRP Phase 2 to sensitive species would be rendered less than cumulatively considerable.

Sensitive Plant Species and Heritage Trees

The NBWRP Phase 2 has the potential to impact the following listed and special-status plants, which have been identified as having at least a low potential to occur in the NBWRP Phase 2 area: Sonoma sunshine, Franciscan onion, Napa false indigo, big-scale balsamroot, narrow-anthered brodiaea, Point Reyes bird's-beak, congested-headed hayfield tarplant, and saline clover. Additionally, construction of facilities may impact heritage trees as defined by local jurisdiction tree ordinances. Implementation of **Mitigation Measures 3.6.6 and 3.6.7** established in **Section 3.6**, **Biological Resources**, which includes pre-construction survey, avoidance, restoration, and compensatory mitigation as appropriate, would reduce potential impacts to rare plant species to a less than significant level.

Other projects within the North San Pablo Watershed could also contribute to disruption or loss of rare plant habitat and heritage trees, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset loss of habitat. Due to the limited potential for NBWRP Phase 2's temporary impacts, and the mitigation measures established in **Section 3.6**, **Biological Resources**, the contribution of the NBWRP Phase 2 to impacts to rare plants and heritage trees would be rendered less than cumulatively considerable.

Mitigation Measures

Mitigation Measures in Section 3.6

Impact Significance after Mitigation: Less than Significant.

Impact 4.6: Cumulative Long-term Impacts on Land Use. Concurrent construction of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to land use and agricultural resources. (*Less than Significant*)

The NBWRP Phase 2 has the potential to impact farmland designated as prime, statewide importance, and unique; however, all of the elements of the Proposed Action would be constructed and operated within existing treatment facilities, roadways, or other developed areas. The Proposed Action would not impact the agricultural use of important farmland. Therefore, there would be no impact.

Other projects within the North San Pablo Watershed could also contribute to disruption or loss of farmlands, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset loss of farmlands. Implementation of the NBWRP Phase 2 would provide recycled water as an irrigation supply to offset potable surface and groundwater supplies currently used for this purpose. Recycled water represents a reliable, local and drought-proof irrigation supply that supports the long-term viability of all agricultural practices within the region. Therefore, the contribution of the NBWRP Phase 2 to impacts regarding the loss of farmlands would be less than cumulatively considerable.

Mitigation Measures

No mitigation measures are required.

Impact Significance after Mitigation: Less than Significant.

Impact 4.7: Cumulative Impacts from Greenhouse Gas Emissions. Concurrent operation of the NBWRP Phase 2 with other projects could result in a cumulatively considerable net increase in GHG emissions or criteria pollutants for which the region is in non-attainment under applicable standards. (*Less than Significant*)

Greenhouse Gases

The NBWRP Phase 2 would result in long-term emissions associated with distribution of recycled water. As noted in Section 3.9, Air Quality, the California Air Resources Board (CARB) has recommended that industrial projects that meet interim CARB performance standards for construction and transportation emissions, and emit no more than 7,000 metric tons of CO_2e[4]per year from non-transportation related GHG sources, should be presumed to have a less than significant impact related to climate change, which is a global cumulative impact issue. Non-transportation sources include combustion related components/equipment, process losses, purchased electricity, and water usage and wastewater discharge (CARB, 2008). As discussed in **Section 3.9**, **Air Quality**, NBWRP Phase 2 GHG construction emissions are estimated at 90 tons CO_2e per year over the 4 year construction period. Operational emissions are estimated at 232 tons CO_2e. Emissions from implementation of the NBWRP Phase 2 would be well below CARB's interim GHG threshold of 1,100 metric tons of CO_2e per year significance threshold.

Other projects within the State would also contribute to GHG emissions, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or offset GHG emissions. Implementation of the NBWRP Phase 2 would provide recycled water as an irrigation supply to offset potable surface and groundwater supplies currently used for this purpose. Due to the limited nature of NBWRP Phase 2's GHG emissions, and the mitigation measures established in **Section 3.9, Air Quality**, the contribution of the NBWRP Phase 2 to the significant cumulative impact associated with GHG emissions would not be considered cumulatively considerable.

Criteria Pollutants

As demonstrated in **Table 4-2,** there are a number of projects in the area that would overlap with implementation of the NBWRP Phase 2. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable. Therefore, if a project would result in an increase in ROG[5], NO_x, PM_{10}, or $PM_{2.5}$ of more than its respective average daily emissions significance thresholds, then it would also contribute considerably to a significant cumulative impact. If a project would not exceed the significance thresholds, its emissions would not be cumulatively considerable. As presented in the Impacts 3.9-1 and 3.9-2 in Section 3.9, Air Quality, short-term construction exhaust emissions would not exceed the applicable significance thresholds and implementation of **Mitigation Measures 3.9-1a and 3.9-1b** would

4 CO_2e: Because GHGs have different warming potentials (i.e., the amount of heat trapped in the atmosphere by a certain mass of the gas), and CO_2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO_2-equivalent (CO_2e) emissions.

5 ROG: reactive organic gases; (NO_2) nitrogen dioxide; (PM_{10}) particulate matter less than 10 microns in diameter; ($PM_{2.5}$) particulate matter less than 2.5 microns in diameter.

ensure that impacts would be reduced to a less-than-significant level. In addition, as the proposed emergency backup generators are the only operational sources of air pollutant emissions and would be subject to permitting requirements per BAAQMD Regulation 2, emissions from routine testing and maintenance of the generator s would also not be considered to substantially contribute towards a cumulative impact. In summary, the project's operational emissions would not be cumulatively considerable and construction-related cumulative impacts would be mitigated to a less-than-significant level.

Mitigation Measures

Mitigation Measures in Section 3.9.

Impact Significance after Mitigation: Less than Significant.

Impact 4.8: Cumulative Long-term Impacts on Cultural and Historic Resources. Concurrent operation of the NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to cultural resources. (*Less than Significant*)

The NBWRP Phase 2 has the potential to for long-term impacts related to the loss of cultural resources and historical resources. Implementation of pipelines, pump stations, and storage facilities would have the potential to result in the permanent loss of cultural resources. As discussed in **Section 3.14**, **Cultural Resources**, it is anticipated that these impacts can be avoided through siting of facilities in previously disturbed areas, such as roadways. Implementation of **Mitigation Measures 3.14.1 and 3.14.2** established in **Section 3.14**, **Cultural Resources**, which includes measures to avoid permanent impacts to cultural resources associated with facility installation.

Other projects within the North San Pablo Watershed could also contribute to disruption or loss of historic sites or archaeological remains, if implemented. These projects have completed or will be required to complete the appropriate level of CEQA compliance and permitting, including the establishment of mitigation measures to minimize or avoid impacts to cultural resources. Due to the limited potential for NBWRP Phase 2's temporary impacts, and the mitigation measures established in **Section 3.12, Cultural Resources**, the contribution of the NBWRP Phase 2 to impacts regarding the loss of cultural resources would be rendered less than cumulatively considerable.

Mitigation Measures

Mitigation Measures in Section 3.14.

Impact Significance after Mitigation: Less than Significant.

CHAPTER 5
Growth Inducement and Secondary Effects of Growth

5.1 Introduction

Section 15126.2(d) of the CEQA Guidelines requires an EIR to evaluate the growth inducing impacts of a proposed action:

> *Discuss the way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

Under NEPA, it is Reclamation's policy to encourage and facilitate the most efficient beneficial use of project water and thus, to encourage changes that implement these policies, consistent with the Reclamation water management mission. Proposals for changes in water use reflect ongoing trends of greater efficiencies in agricultural water use. A NEPA review is required to identify the likely environmental consequences of such proposals, and this information must be considered in Reclamation decision-making. In assessing the environmental impacts of changes in water use, numerous issues arise, including: What is the relationship of water supply and urban population growth? Is the change growth inducing, or are we simply accommodating unavoidable demographic trends by providing a relatively impact-free source of water? How far, and to what degree, do we follow the impacts that are associated with the newly approved water use?

According to the Reclamation's NEPA Handbook, one way to determine if the change in water use will cause growth is to prepare an Environmental Assessment to assist Reclamation in determining whether the urban growth is a consequence of the project water supply, or whether the growth would occur anyway, even in the absence of the project water (Reclamation, 2012). If comparable quantities of alternative water supplies are reasonably available (as supported by appropriate documentation), then the "future without" scenario is probably very similar to the proposed action with respect to population growth issues. This can be documented in the "no action" ("future without") alternative, eliminating the need for a detailed discussion of issues and impacts which are not a consequence of the Federal action at issue. In situations in which it is clear that growth is a result of the provision of project water ("but for" the provision of project water, this growth would not occur), and these impacts can be attributed to the Federal action, detailed descriptions of the impacts must be provided in the NEPA document.

A project can have direct and/or indirect growth inducement potential. Direct growth would result if a project involved construction of new housing. A project can have indirect growth inducement if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) or if it would involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. A project would also have an indirect growth inducement effect if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service.

Based on the CEQA and NEPA discussions above, assessing the growth-inducement potential of the NBWRP Phase 2 involves answering the question: "Would implementation of the proposed project directly or indirectly support economic expansion, population growth, or residential construction?" Water supply is one of the chief, though not the only, public services needed to support urban development. A water service capacity deficiency could constrain future development, particularly if coupled with strong community policy. Adequate water supply, treatment, and conveyance would play a role in supporting additional growth in the project area, but it would not be the single impetus to such growth. Factors such as the General Plans and policies of the cities and counties and/or the availability of wastewater disposal capacity, public schools, and transportation services also influence business and residential or population growth in the planning area. Economic factors, in particular, greatly affect development rates and locations.

Growth induced from a project may result in adverse impacts if the growth is not consistent with the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service and solid waste service. The urban development may have environmental impacts, as identified in CEQA documents prepared for adoption of local land use plans. A project that would induce "disorderly" growth that is in conflict with local land use plans could indirectly cause additional adverse environmental impacts and impacts to other public services. Thus, it is important to assess the degree to which the growth accommodated by a project would or would not be consistent with applicable land use plans.

5.2 Growth-Inducement Potential

5.2.1 Direct Growth-Inducement Potential

To determine direct growth inducement potential, the NBWRP Phase 2 was evaluated to verify whether an increase in population or employment, or the construction of new housing would occur as a direct result of the project. The NBWRP Phase 2 would not include construction of new housing, and would not require new housing for construction workers that would be required during short-term construction. Construction of the NBWRP Phase 2 would involve short-term workers for the course of the construction activities. Operation of the proposed NBWRP Phase 2 would not involve a substantial change in the existing operation and maintenance activities of the existing wastewater treatment plants or other facilities of the Member Agencies, and would not result in additional long-term workers. Therefore, the proposed NBWRP Phase 2 would not result in a direct increase in population or employment or new housing.

5.2.2 Indirect Growth-Inducement Potential

To determine indirect growth inducement potential, the proposed NBWRP Phase 2 was reviewed to ascertain whether it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service. Therefore, to assess whether the proposed NBWRP Phase 2 would induce growth indirectly, it must be determined whether the project frees up (i.e., increases the amount of) potable water that would be available for urban development, thus removing an obstacle for growth. To make this determination, this section studies the current and projected water demand in the individual Member Agency service areas, planned use of recycled water as a supply source to meet increasing water demands, and the role of the proposed NBWRP Phase 2. In addition, projected growth and potential development that is planned under the local general plans are presented, as relevant.

5.3 Water Supply and Recycled Water Use

The following section presents a summary of projected urban water demands for 2035 within the NBWRP Phase 2 service area. The Member Agencies include water and wastewater providers serving the urban areas of San Rafael, Novato, Petaluma, Sonoma, Napa and American Canyon. This information has been compiled from 2015 Urban Water Management Plans (UWMPs) prepared by the individual water agencies within the NBWRP Phase 2 project area. UWMP Projections include water demands, water supply, conservation, and recycled water levels that have been included in regional water supply planning. NBWRA Member Agencies participating in NBWRP Phase 2, and their corresponding water service or wastewater treatment providers, are shown in **Table 5-1**. **Table 5-1** also shows projected population of urban areas within the NBWRP Phase 2 area. **Table 5-2** summarizes water supplies within the area and **Table 5-3** summarizes projected water demands within urban areas. **Table 5-4** shows projected water recycling identified with the UMWPs within the NBWRP Phase 2 Study area, and presents the recycled water use projections provided by the urban water suppliers and includes the name of the respective recycled water supplier for each urban water agency. **Table 5-5** summarizes the relationship between total projected population and urban water demands within the NBWRP Phase 2 service areas, recycled water planning, and the amount of recycled water provided by the NBWRP Phase 2. The total projected urban water use within the NBWRP Phase 2 Service Areas is estimated to be 68,599 AFY by 2035. Implementation of the NBWRP Phase 2 would provide approximately 4,904 AFY of urban irrigation demand offset.

TABLE 5-1: POPULATION OF URBAN AREAS WITHIN THE NBWRP PHASE 2 STUDY AREA

Urban Water Agency	Recycled Water Supplier	2015	2035
Marin Municipal Water District[1]	Las Gallinas Valley Sanitary District and CMAC	189,000	205,000
North Marin Water District	Novato Sanitary District [1]	61,381	66,139
City of Petaluma[1]	City of Petaluma [1]	61,798	70,920
City of Sonoma	Sonoma Valley County Sanitation District [1]	11,147	12,130
VOM Water District (VOWMD)	Sonoma Valley County Sanitation District [1]	23,782	25,943
City of Napa	Napa Sanitation District [1]	87,615	98,819
City of American Canyon [1]	City of American Canyon [1]	20,315	28,903
Total		**455,038**	**507,854**

NOTE:

[1] NBWRP Phase 2 Member Agency.

SOURCE: Brown and Caldwell, 2017; 2015 UWMPs for each agency.

TABLE 5-2: WATER SUPPLIES IN THE NBWRP PHASE 2 STUDY AREA FOR URBAN USE (AFY)

Supply Source	2015	2035
Local surface water	40,700	39,200
Imported surface water	49,675	57,014
Groundwater	720	150
Recycled water	3,920	6,043
Total	**95,015**	**102,407**

SOURCE: Brown and Caldwell, 2017; Information on water supplies compiled using 2015 UWMPs for each NBWRA agency, including: Local Surface Water Supplies for Urban Areas; Imported Water Supply for Urban Area; Normal Year Groundwater Use for Urban Area; Projected Potable Water Offsets for Recycled Water.

TABLE 5-3: PROJECTED POTABLE WATER USE (AFY)

Urban Water Agency	2015	2020	2025	2030	2035
MMWD	23,206	25,387	25,238	25,119	25,260
NMWD	7,829	8,926	8,972	8,977	9,069
City of Petaluma	6,744	8,398	8,693	8,956	9,277
City of Sonoma	1,762	2,174	2,210	2,231	2,267
VOMWD	2,528	3,121	3,125	3,111	3,110
City of Napa	12,034	14,189	14,716	15,056	15,441
City of American Canyon	2,976	3,405	3,622	3,898	4,175
Total	**57,079**	**65,600**	**66,576**	**67,348**	**68,599**

SOURCE: Brown and Caldwell, 2017; 2015 UWMPs for each NBWRA agency.

TABLE 5-4: UWMP PROJECTED POTABLE WATER OFFSETS FROM RECYCLED WATER USE (AFY)

Urban Water Agency	Recycled Water Supplier	2015	2020	2025	2030	2035
MMWD	Las Gallinas Valley Sanitary District and others	520	520	520	520	520
NMWD	Novato Sanitary District	454	650	650	650	650
City of Petaluma	City of Petaluma	846	1,138	1,301	1,339	1,399
City of Sonoma	Sonoma Valley County Sanitation District	0	55	55	55	55
VOMWD	Sonoma Valley County Sanitation District	0	0	0	0	0
City of Napa	Napa Sanitation District	437	650	855	1,095	1,095
City of American Canyon	City of American Canyon	385	1,007	1,146	1,351	1,862
Total		**2,642**	**4,020**	**4,527**	**5,010**	**5,521**

SOURCE: Brown and Caldwell 2017; 2015 UWMP for each NBWRA agency.

TABLE 5-5: RELATIONSHIP OF NBWRP PHASE 2 TO LONG-TERM URBAN WATER DEMANDS AND SUPPLY BY NBWRA SERVICE AREA

	2035 Urban Demand[1]	2035 Projected Recycled Water[1]	Projected Supply 2035[2]	NBWRP Phase 2			Population		Wastewater Agency
				Urban	Ag/Env	Total	2010	2035	
Marin Municipal Water District	25,260	520		153	0	153	190,600	205,000	Central Marin San District
North Marin Water District	9,096	650		286	880	1,166	60,423	66,139	Novato San District
City of Petaluma	9,277	1,339		935	1,343	2,278	60,214	70,920	City of Petaluma
City of Sonoma	2,267	55		0	200	200	11,426	12,130	Sonoma Valley CSD
VOM Water District (VOWMD)	3,110	0		0	0	0	23,478	25,943	Sonoma Valley CSD
City of Napa	15,441	1,095		267	534	811	86,743	98,819	Napa San District
City of American Canyon[a]	4,175	1,862		295	0	295	19,392	28,903	City of American Canyon
Total	**68,599**	**5,521**	**102,407**	**1,936**	**2,966**	**4,903**	452,276	507,854	
Urban vs. Agricultural (%)				**40%**	**60%**	**100%**			

NOTES:
1 Projected Urban Demands and Recycled Water Supplies compiled using 2015 UWMPs.
2 Brown and Caldwell, 2017; Information on water supplies compiled using 2015 UWMPs for each NBWRA agency, including: Local Surface Water Supplies for Urban Areas; Imported Water Supply for Urban Area; Normal Year Groundwater Use for Urban Area; Projected Potable Water Offsets for Recycled Water.

SOURCE: Brown and Caldwell 2017; ESA 2017

5.4 Agricultural Demands

The USGS developed estimates of the 2010 agricultural water use for all of Marin, Napa, and Sonoma Counties, as shown in **Table 5-6**. Agricultural water use is broken into three categories: irrigation, livestock, and aquaculture. Almost all of the agricultural water use is for irrigation.

TABLE 5-6: AGRICULTURAL WATER USE IN 2010 IN THE MARIN-NAPA-SONOMA COUNTIES (AFY)

Type	Marin County	Napa County	Sonoma County	Total
Irrigation	10,127	76,948	166,711	253,786
Livestock self-supplied	1,154	145	3,596	4,895
Aquaculture self-supplied	0	661	6,923	7,584
Total	**11,281**	**77,754**	**177,230**	**266,265**

SOURCE: Brown and Caldwell, 2017.

The DWR generates Detailed Analysis Units (DAU) for sub-watershed areas within each county that estimate irrigated crop acreages and applied water for 20 crop categories. The Detailed Analysis Units for 2010 for the Napa, South Sonoma, and East Marin sub-watershed areas are shown in **Table 5-7**. The majority of irrigated crop was, and continues to be, vine crops.

TABLE 5-7: IRRIGATED CROP AREA IN 2010 (ACRES) BY DWR DETAILED ANALYSIS UNIT (DAU)

DAU Number	040	391	392	
DAU Name	Napa	South Sonoma	East Marin	Total
Grain	108	326	-	434
Corn	-	79	-	79
Other Field[a]	-	73	-	73
Pasture	543	1,288	1,071	2,902
Oth Trk[b]	112	394	3	509
Oth Deciduous[c]	73	51	-	124
Subtrop[d]	214	189	180	583
Vine	39,251	14,498	96	53,845
Total	**40,301**	**16,898**	**1,350**	**58,549**

NOTES:

[a] Includes flax, hops, grain sorghum, sudan, castor beans, miscellaneous fields, sunflowers, hybrid sorghum/sudan, millet and sugar cane.

[b] Includes artichokes, asparagus, beans (green), carrots, celery, lettuce, peas, spinach, flowers nursery and tree farms, bush berries, strawberries, peppers, broccoli, cabbage, cauliflower and Brussel sprouts.

[c] Includes apples, apricots, cherries, peaches, nectarines, pears, plums, prunes, figs, walnuts and miscellaneous deciduous.

[d] Includes grapefruit, lemons, oranges, dates, avocados, olives, kiwis, jojoba, eucalyptus and miscellaneous subtropical fruit.

SOURCE: Brown and Caldwell, 2017.

5.5 Recycled Water Use Under NBWRP Phase 2

5.5.1 Recycled Water Use Under NBWRP Phase 2 – Member Agencies

A discussion of recycled water use and General Plan policies regarding recycled water use for each of the Member Agencies is provided in **Appendix 5**.

5.5.2 Summary of the Indirect Growth Inducement Potential

Recycled water use under the NBWRP Phase 2 would offset potable water demand within some urban areas, and could make potable water available for new development within urbanized areas. However, as discussed above, the new development is part of planned growth and development of the individual General Plans, which include policies incorporating recycled water use into water supply management. Under NBWRP Phase 2, urban irrigation supplies would be made available for San Quentin Penitentiary (San Rafael), Novato, Petaluma and American Canyon. These supplies would not induce additional growth beyond that planned for in each of these urban areas. The level of growth would be consistent with the extent planned and approved by the local General Plans in the area, and provision of recycled water to offset use of potable supplies would be consistent with General Plan policies within these areas.

The provision of adequate water supply is an essential component for the preservation of agricultural practices within the region. There are local policies that preserve agricultural land uses in the region. The Napa General Plan for example, has policies for agricultural preservation because agricultural and related activities are the primary land uses in Napa County. Napa County's Measure J - the Agricultural Lands Preservation Initiative, was passed in 1990 and is intended to preserve the County's agricultural lands, which have a General Plan land use designation of Agricultural Resource or Agricultural, Watershed and Open Space. Measure J provides that, lands designated as "Agricultural Resource" or "Agriculture, Watershed and Open Space" may not be re-designated to another land use category except by a majority vote of the people; if the land is annexed to a city; or if it is re-designated by the Board of Supervisors pursuant to procedures set forth in the initiative, and only if certain findings can be made. The General Plan at the time of adoption of Measure J, provided for a minimum parcel size of 160 acres for lands designated as Agriculture, Watershed and Open Space; and a minimum parcel size of 40 acres for lands designated as Agricultural Resource.

The recycled water use is a part of the planned water supplies and would not provide new water supplies or remove obstacle to growth beyond that discussed in the General Plan EIRs. Effects resulting from growth anticipated in the individual service areas for the Member Agencies are discussed in Section 5.6 below.

5.6 Secondary Effects of Growth

Impact 5.1: The NBWRP Phase 2 would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of Marin, Sonoma and Napa Counties. No appreciable growth in population or employment would occur as a direct result of construction or operation of the proposed facilities. However, development under the General Plans accommodated by the proposed project could result in secondary environmental effects, which include effects that could be significant and unavoidable.

NBWRP Phase 2 would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans within Marin, Sonoma and Napa Counties. Because recycled water would not be used to directly support new development as a potable water supply, no appreciable growth in population or employment would occur as a direct result of construction or operation of proposed facilities. However, use of recycled water has the potential to offset potable supplies, and as part of the larger water supply portfolio, has a contribution to growth under the approved General Plans within the region. As identified in the General Plan EIRs for each jurisdiction, development under the approved General Plans would result in secondary environmental effects, which include environmental effects that would remain significant and unavoidable, even after mitigation.

Secondary effects of growth identified in the local General Plan EIRs, as well as the policies and mitigation measures established to minimize the effects, are summarized in the tables and discussion in **Appendix 5** for each Member Agency, where applicable. These secondary effects of growth are proportional to the scale of the project being proposed by individual Member Agencies, and are considered incremental in the context of the Member Agency's overall water supply portfolio.

Buildout under the General Plan requires several types of infrastructure, including an adequate water supply; the proposed action would contribute to the provision of adequate water supplies, both urban and agricultural, within the service areas of the Member Agencies. The secondary impacts related to buildout under the approved General Plans within the service areas of the NBWRA Member Agencies are disclosed in the General Plan EIRs for Cities of San Rafael, Novato, Sonoma, Napa, Petaluma, and American Canyon, and the Counties of Marin, Sonoma, and Napa. A summary of impacts from the General Plan EIRs and mitigation measures that would reduce the impacts to less-than-significant levels is discussed below.

With the exception of the Cities of Petaluma and American Canyon, the NBWRA Member Agencies comprise wastewater and water agencies, which do not have the authority to control land use and growth within the recycled water service areas identified under the NBWRP Phase 2, or to mitigate for the secondary effects of those land use decisions. Marin, Sonoma and Napa Counties, and the incorporated cities of San Rafael, Novato, Sonoma, Napa, Petaluma and American Canyon have primary land use jurisdiction and responsibility to regulate growth through the land use planning and development approval process. Other agencies, which have decision-making authority to implement mitigation measures related to secondary impacts of growth in the project area are shown in **Table 5-8**.

TABLE 5-8: AGENCIES HAVING PLANNING AND MITIGATION AUTHORITY

Agency	Authority
Marin, Sonoma and Napa Counties	Responsible for planning, land use, and environmental protection of unincorporated areas. Of particular importance are development of presently undeveloped lands, provision of regional solid waste management facilities, and regional transportation, air quality and flood control improvement programs.
Cities of Novato, Sonoma, Napa, San Rafael, Petaluma, and American Canyon	Responsible for adoption of the General Plan and various planning elements and local land use regulations. Adopts and implement local ordinances for control of noise and other environmental concerns. Participates in regional air quality maintenance planning through adoption of local programs to control emissions via transportation improvements. Responsible for enforcing adopted energy efficiency standards in new construction.
Local Agency Formation Commission	Empowered to approve or disapprove all proposals to incorporate cities to form special districts or to annex territories to cities or special districts. Also empowered to guide growth of governmental service responsibilities.
Regional Water Quality Control Board, San Francisco Bay Region	Shares responsibility with State Water Resources Control Board (SWRCB) to coordinate and control water quality. Formulates and adopts water quality control plans. Implements portions of the Clean Water Act when the U.S. EPA and SWRCB delegate authority, as is the case with issuance of National Pollutant Discharge Elimination System (NPDES) permits for waste discharge, reclamation, and storm water drainage.
State Department of Health	Responsible for the purity and potability of domestic water supplies for the state. Assists SWRCB and Regional Water Quality Control Boards (RWQCBs) in setting quality standards.
California Air Resources Board	Responsible for adopting and enforcing standards, rules, and regulations for the control of air pollution from mobile sources throughout the state.
Bay Area Air Quality Management District	Adopts and enforces local regulations governing stationary sources of air pollutants. Issues Authority to Construct Permits and Permits to Operate. Provides compliance inspections of facilities and monitors regional air quality. Developed the Clean Air Plan in compliance with the Clean Air Act.
U.S. Fish and Wildlife Service	Requires consultation under Section 7/10 of the Endangered Species Act for projects which could potentially impact endangered or threatened species. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves mitigation measures to reduce impacts and establishes Habitat Conservation Plans (HCPs).
U.S. Army Corps of Engineers	Issues permits to place fill in waterways pursuant to Section 404/408 of the Clean Water Act.
California Department of Fish and Wildlife	Issues Stream Bed Alteration Agreements for projects potentially impacting waterways.

SOURCE: ESA

Local land use plans and specific development plans have been adopted and approved, with the local lead agency adopting a statement of overriding consideration for these significant unavoidable effects. The proposed project would not increase the nature, number or severity of significant effects associated with planned development.

5.6.1 No Project Alternative

Under the No Project Alternative, project implementation would not occur. There would be no change from existing conditions. No alteration of the location, rate, or timing of growth within the project area would occur, and no secondary effects related to that growth would occur. For discussion of the No Project Alternative, future conditions, please refer to the No Action Alternative below.

5.6.2 No Action Alternative

Under the No Action Alternative, which includes consideration of future conditions, it is likely that a subset of water recycling projects would be implemented by the Member Agencies on an individual basis, without the benefit of regional coordination or federal funding. These projects would provide an estimated 1,187 AFY of recycled water supply.

Future conditions (2040) would include continued development under the Marin, Sonoma, and Napa General Plans, as well as the General Plans for each of the municipalities served by the Member Agencies. Development of both urban and agricultural uses would continue to place pressure on surface and groundwater resources within the region, particularly during high demand summer months, when the reliability of supplies is reduced. As previously shown in **Table 5-1,** population within the region is anticipated to increase by approximately 4 percent through 2040; **Table 5-2** and **Table 5-3** show the total projected water use in the individual service areas and total water use by agency contractors and customers. The secondary effects of growth associated with the No Action Alternative would be similar to, but reduced from, the impacts identified for the Proposed Action. These impacts,

including secondary effects of growth, would be in proportion to amount to recycled water development that would occur under this alternative (1,187 AFY). A discussion of secondary effects of growth related to the Proposed Action is provided below.

5.6.3 Proposed Action

Compared to the No Project Alternative (CEQA Baseline), NBWRP Phase 2 would provide 4,885 AF of new recycled water for beneficial use and would include: installation of 19.8 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 4.87 mgd of tertiary treatment capacity, and development of approximately 10.1 acre-feet of storage, primarily for agricultural use. Compared to the No Action Alternative (NEPA Baseline), NBWRP Phase 2 would provide 8.2 miles of new pipeline and 3,698 AFY of potable water offset.

Table 5-9 provides a summary of impacts identified as significant and unavoidable in the General Plan EIRs for the approved General Plans within the Member Agency Service Areas. A discussion of recycled water use, general plan policies, significant impacts identified, and mitigation measures identified in the General Plan EIRs applicable to each of the Member Agencies is provided in **Appendix 5**.

TABLE 5-9: SUMMARY OF SIGNIFICANT UNAVOIDABLE IMPACTS, GENERAL PLAN EIRS

Impacts	Marin Co.	Novato	San Rafael	Sonoma Co.	City of Sonoma	Petaluma	Napa	American Canyon
Significant Unavoidable Impacts								
Displacement of wetlands.*		X						
Buildout traffic will cause portions of Highway 101 and Highway 37 to operate at unacceptable levels of service.**		X						
Increased number of calls for emergency medical response.		X						
Increased need for police protection.		X						
Conversion of undeveloped, agricultural, or open space lands to urban uses or changes in land use type.					X			
Compatibility of land uses with adjacent communities.					X			
Conversion of farmland/ prime agricultural soils to urban uses.					X			
Impacts to local roadways and intersections which would result in unacceptable LOS.					X			
Increased volumes on local roadways.					X			
Public transit capacities would be inadequate to meet increased traffic demand and transit demand.					X			
Compliance with regional air quality plan and federal air quality standards.					X			
New emissions generated by new development would increase air pollution and cause deterioration in regional air quality.					X			
Significant increase in noise for some existing residents from increased traffic, recreational activities, and commercial and industrial uses.					X			
Development would require additional law enforcement officers, equipment & facilities.					X			
Development in rural/hilly areas would increase the potential risk for wildland fires.					X			
Need for additional emergency medical services, fire fighters, equipment & facilities.					X			
Demand for school facilities may exceed available capacity, and facilities may be degraded.					X			
Increased need for library facilities.					X			
Need for new parks & recreational facilities and/or managed open space.					X			
Increased demand for, water supply & water service extensions.					X			

TABLE 5-9: SUMMARY OF SIGNIFICANT UNAVOIDABLE IMPACTS, GENERAL PLAN EIRS (CONTINUED)

Impacts	Marin Co.	Novato	San Rafael	Sonoma Co.	City of Sonoma	Petaluma	Napa	American Canyon
Significant Unavoidable Impacts (cont.)								
Increased demand for supply, treatment and distribution facilities for wastewater.					X			
Generation of significant amounts of solid waste, including demand for a new County landfill site.					X			
Growth in population and employment could lead to possible damage, destruction, or removal of recorded and unrecorded cultural resources.					X			
Future development has the potential to adversely affect historic resources.					X			
Residential, commercial and industrial growth under the plan would increase energy consumption.					X			
The impacts of increased population and jobs occur as secondary impacts.					X			
Increased need for housing units, particularly affordable housing units, as population increases.					X			
Substantial alteration of Valley's visual character.					X			
Potential for structural damage and injury or loss of life due to impacts from strong groundshaking, including liquefaction.					X			
Grading and excavation will permanently change the ground surface relief.					X			
Increased risk of pollution from the use, storage, and treatment of hazardous materials.					X			
Increased demand for hardrock and aggregate resources.					X			
Short-term erosion and associated sedimentation potentials, with impacts to water quality.					X			
Impacts to groundwater by reducing supply due to interruptions of recharge and upstream retention of surface flow.					X			
Increase of urban runoff pollutants and degradation of existing water quality.					X			
Increase in quantity of runoff, leading to increased flooding hazards.					X			
Permanent direct habitat loss and accompanying reduction or elimination of dependent wildlife, including some special status species.					X			
Permanent loss of significant habitat (creeks, vernal pools, swales, riparian habitat, freshwater marshes, native grasslands, significant trees, etc).					X			
Cumulative direct loss of wildlife habitat.					X			
Substantial alteration of Valley's visual character.				X				
Growth within unincorporated areas.	X							
Convert farmland/prime agricultural soils to urban uses.	X							
Increase in vehicle miles traveled.	X							
Impacts to local roadways and intersections which would result in unacceptable LOS.	X							
Increased volumes on local roadways.	X							
Inconsistent with Clean Air Plan Transportation Control.	X							
Buffer zones for potential source of odor/toxics.	X							
Increase in greenhouse gas emissions	X							
Temporary significant increase in noise from construction activities.	X							

TABLE 5-9: SUMMARY OF SIGNIFICANT UNAVOIDABLE IMPACTS, GENERAL PLAN EIRS (CONTINUED)

Impacts	Marin Co.	Novato	San Rafael	Sonoma Co.	City of Sonoma	Petaluma	Napa	American Canyon
Significant Unavoidable Impacts (cont.)								
Potential for structural damage and injury or loss of life due to impacts from strong groundshaking, including liquefaction.	X							
Increased risk from seismic related ground failure.	X							
Increased exposure of people and structures to landsliding.	X							
Cumulative direct and permanent loss, fragmentation of existing wildlife habitat, and obstruction of movement between habitats.	X							
Level of service at various intersections.			X					
Impacts to on-street parking along various streets.			X					
Increased rail noise.			X					
Release of hazardous materials.			X					
Exacerbation of deficiency in park facilities.			X					
Demand for police services that exceeds existing capacity.			X					
Demand for library services.			X					
Wastewater Treatment capacity- south of Puerto Suello Hill.			X					
Potential for demand to exceed water supplies.			X					
Exposure of people or structures to landslide events.			X					
Conflicts with agricultural zoning and Williamson Act Contracts.							X	
Population, housing, and employment increases exceed ABAG projections.							X	
Increased travel demand, insufficient level of road service, regional traffic growth.							X	
Loss of sensitive biotic communities.							X	
Increased volume of project-generated traffic noise.							X	
Impacts from roadway improvements on noise-sensitive uses.							X	
Consistency with air quality regulations.							X	
Conflicts with particulate matter attainment efforts.							X	
Exposure to air toxic contaminants.							X	
Increase in long-term atmospheric greenhouse gas emissions.							X	
Impacts from seismic groundshaking on infrastructure							X	
Impacts from seismic related ground failure.							X	
Landslide damage to roadway infrastructure.							X	
Subsidence and settling.							X	
Reduction in groundwater supply and increased overdraft conditions.							X	
Impacts to historic architectural resources.							X	
Need for fire protection and emergency services.							X	
Need for additional law enforcement officers and facilities.							X	
Impacts to water supply and water quality.							X	
Increased demand for park and recreational facilities.							X	
Degradation of scenic resources and the visual character of the area.							X	

TABLE 5-9: SUMMARY OF SIGNIFICANT UNAVOIDABLE IMPACTS, GENERAL PLAN EIRS (CONTINUED)

Impacts	Marin Co.	Novato	San Rafael	Sonoma Co.	City of Sonoma	Petaluma	Napa	American Canyon
Significant Unavoidable Impacts (cont.)								
Increase in daytime glare and nighttime lighting.							X	
Unacceptable level of service (LOS) at study intersections.						X		
Generate increased local traffic volumes in the Planning Area that would result in a substantial increase to existing exterior noise levels that are currently above the City standards.						X		
Result in population levels that could conflict with the Bay Area 2005 Ozone Strategy						X		
Result in an irretrievable loss of currently undeveloped lands which are presently existing within the planning area.								X
Impacts related to the Theoretical Buildout place demands on the future balance of socioeconomics for American Canyon.								X
Result in unacceptable capacity deficiencies at one location exceeding identified ADT impacts performance criteria.								X
Creation of additional demand for sworn officers over the life span of Plan to maintain acceptable level of police protection.								X
Exceed the AQMD's air pollution thresholds of construction related emissions for ROG, NOx, and SOx.								X
Air Quality emissions related to daily operations of the proposed General Plan will have significant and adverse impacts on long-term air quality in terms of NOx, SOx, and PM10.								X
Potential to affect species of animal or plant or the habitat of the species; diminish habitat for fish, wildlife, or plants; and result in cumulatively significant impact.								X
Potentially significant impacts related to elevated magnetic fields are related to the placement of sensitive receivers to magnetic power lines.								X

5.6.4 Storage Alternative

Compared to the No Project Alternative (CEQA Baseline), the Storage Alternative include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek WRF, and 600 AF of tertiary treated water storage for Napa SD along with 11.2 miles of distribution pipelines. Implementation of the Storage Alternative would result in a combined storage facility construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply. The potential for secondary effects of growth would be equivalent to, but greater than, those identified above for the Proposed Action. Secondary effects of growth identified in the local General Plan EIRs, as well as the policies and mitigation measures established to minimize the effects, are summarized in the tables and discussion in **Appendix 5** for each Member Agency, where applicable. These secondary effects of growth are proportional to the scale of the project being proposed by individual Member Agencies, and are considered incremental in the context of the Member Agency's overall water supply portfolio.

Novato SD Service Area. Under the Storage Alternative, an additional increment of 436 AFY would be available for irrigation offset due to tertiary treatment plant improvements and storage. This increment of recycled water offset would not be anticipated to affect the rate, level, or distribution of growth in the Novato SD area.

SVCSD. Under the Storage Alternative, an additional increment of 98 AFY would be available for irrigation offset due to provision of additional storage. Under the Storage Alternative, recycled water would be available to offset 298 AFY of agricultural

demands in Sonoma Valley, or approximately 4 percent of the combined potable demand increase identified for City of Sonoma and Valley of the Moon. As previously noted, Sonoma County Water Agency has included provision of recycled water to the Sonoma Valley within its regional water supply projections.

Because the provision of recycled water has been included within the water supply planning of SCWA for urban uses, and NBWRP Phase 2 is consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban or agricultural growth within the City of Sonoma or Sonoma Valley.

MMWD. Under the Storage Alternative, no additional facilities would be constructed within the MMWD service area.

Napa SD. Under the Storage Alternative, an additional increment of 1,050 AFY would be available for irrigation offset due to provision of additional storage. Under the Storage Alternative, recycled water be available to offset 1,861 AFY of agricultural and urban demands, increasing the reliability of recycled water supplies particularly in the high demand summer irrigation periods to the City of Napa, Carneros and MST areas for agricultural, golf course and residential landscaping. This increment of recycled water offset would not be anticipated to affect the rate, level, or distribution of growth in Napa County.

City of Petaluma. Under the Storage Alternative, an additional increment of 300 AFY would be available for irrigation offset due to tertiary treatment plant improvements and storage. Assuming this storage is applied to urban distribution, NBWRP Phase 2 would provide 1,235 AFY to urban irrigation uses within the City service area. This represents approximately 45 percent of the projected 2,737 AFY of additional water supply projected as necessary to meet demands associated with buildout under the approved General Plans within its service area. Because recycled water is included within the water supply planning of SCWA and the City of Petaluma, and NBWRP Phase 2 would be consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban growth within the City of Petaluma.

City of American Canyon. Under the Storage Alternative, no additional facilities would be constructed within the American Canyon service area.

Mitigation Measures

Mitigation Measure 5-1a: No additional Mitigation Measures Required.

Impact Significance after Mitigation: NBWRP Phase 2 and the Storage Alternative would not result in direct impacts relating to growth inducement in the NBWRA Phase 2 area. However, provision of recycled water within each of the NBWRP Phase 2 service areas would contribute to secondary effects of growth associated with buildout under approved General Plans within each service area. Mitigation programs have been established for these impacts, however, these impacts have been identified as remaining significant and unavoidable after mitigation by individual General Plan EIRs.

CHAPTER 6
Alternatives Analysis

6.1 Introduction

CEQA and NEPA both require an EIR and EIS, respectively, to describe and evaluate a reasonable range of alternatives to a project or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. This chapter describes the development of the project alternatives, presents the project alternatives, evaluates the alternatives for consistency with stated project objectives, summarizes and compares the environmental impacts and economic feasibility of the alternatives, in order to make recommendations on the environmentally superior alternative.

The CEQA Guidelines set forth the following criteria for selecting alternatives:

1. ". . . [T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." §15126.6(b))
2. "The range of potential alternatives shall include those that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially lessen one or more of the significant effects." §15126.6(c)
3. "The specific alternative of 'no project' shall also be evaluated along with its impacts." §15126.6(e)(1)
4. "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could meet most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making." §15126.6(f)
5. In general, there are two types of alternatives that may be reviewed in an EIR: (1) alternatives *to* the project that are other projects entirely, or other approaches to achieving the project objectives rather than the project or modified project; and (2) alternatives *of* the project that include modified project components, such as alternative project sites or processes and/or modified facilities, layout, size, and scale. This chapter evaluates both types of alternatives in order to develop a reasonable range of alternatives for evaluation in this EIR/EIS and describes the alternatives of the project that were carried forward for further analysis. This chapter also describes alternatives to the project that were not discussed further and the reasons for which they were not carried forward for analysis.

CEQ regulations require federal agencies to:

1. Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives that were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
2. Devote substantial treatment to each alternative considered in detail (reasonable alternatives), including the preferred alternative, so that reviewers may evaluate their comparative merits.
3. Include reasonable alternatives not within the jurisdiction of the lead agency.
4. Include the No Action Alternative. "No action" is defined as the most likely future that could be expected to occur in the absence of the project. Where this future is different from the existing conditions, the differences should be clearly defined.

According to NEPA, alternatives considered, but not found to be technically feasible or reasonable, should be presented briefly, along with the reasons they were eliminated from further analysis. Examples of reasons for elimination are: (1) failure of the alternative to meet the requirements of the purpose of and need for the action, (2) the alternative cannot be technically implemented, (3) the alternative is prohibitively greater in cost or in environmental impacts than the other alternatives, or (4) the alternative cannot be reasonably implemented. A complete listing of all alternatives seriously considered or publicly discussed in the scoping process should be included.

6.2 NBWRP Alternatives Development

The development of alternatives for the NBWRP Phase 2 was completed as part of the iterative Feasibility Study process required under Reclamation's Title XVI Program. The NBWRP Phase 2 builds upon the NBWRP Phase 1 technology and infrastructure investments to further develop recycled water as part of the North San Pablo Bay region's water supply portfolio. The following

summarizes the alternatives development process presented in the *North Bay Water Reuse Program Phase 2 Feasibility Study* prepared for NBWRA in June, 2017, by Brown and Caldwell.

A stakeholder-driven process was applied to select the suite of projects which would comprise the NBWRP Phase 2. NBWRP objectives and sub-objectives were used to screen and score the projects initially identified and to demonstrate the qualitative and quantitative value each project would contribute to meeting these objectives. Using that refined list of projects, the process was re-applied to include screening and valuation to formulate NBWRP Phase 2 alternatives.

The initial activity was to develop appraisal-level project layouts and costs for initial screening purposes. The first screening removed projects that would not be implemented in the near-term and projects that were not directly sponsored by the NBWRA Member Agencies. The remaining projects were then scored against the NBWRP objectives with total costs applied. A sensitivity analysis was then conducted to address other benefits beyond total costs that a project may provide to the NBWRP. The highest-ranking projects were formulated into three potential NBWRP alternatives.

1. **Alternative 1**: Represents the highest scoring combination of projects based on weightings and costs of projects that would make up an approximately $90 million program.
2. **Alternative 2**: The combination of highest scoring projects that maximizes the NBWRP's water supply yield.
3. **Alternative 3**: Represents the combination of highest scoring projects that maximizes environmental benefits.

These alternatives were further evaluated, resulting in an alternative consisting of a combination of projects that best addressed the NBWRP objectives. This subsequent evaluation consisted of the following steps:

1. **Project Refinement**: The list of projects in each alternative was further examined and refined to focus on the most successful components. In some cases, projects were disaggregated to address cost limitations and phasing issues, dropped as they were seen as long-term projects, or no longer met Member Agency needs.
2. **Project Feasibility Analysis**: This analysis evaluated projects in each alternative in more detail at a cost-feasibility level to meet Member Agency constraints.
3. **Member Agency Evaluations**: Staff of each Member Agency then worked with their respective Boards of Directors to select projects that provided the most benefit (water supply, environmental, cost effectiveness, etc.) and met their financial constraints.

This iterative process yielded the NBWRP Phase 2 or the "Proposed Action" discussed below.

6.3 Alternatives Carried Forward for Analysis

As described in Section 2.6, Alternatives to Be Considered, and analyzed in Chapter 3, the alternatives summarized below were carried forward and analyzed in this EIR/EIS:

No Project Alternative: Discussion of the No-Project Alternative must examine the existing conditions and reasonably foreseeable future conditions that would exist if the project were not approved (CEQA Guidelines §15126.6(e)). Under the No Project Alternative, the NBWRP Phase 2 would not be implemented and none of the proposed construction would occur nor would related water supply benefits result.

No Action Alternative: Consideration of the No Action Alternative is required under NEPA. The No Action Alternative represents a "future-without-project" scenario: a continuation of existing conditions for an estimation of the most reasonable future conditions that could occur without implementation of the Proposed Action or Storage Alternative. The No Action Alternative assumes that there is no joint project among the Member Agencies. It represents the "current status" in which additional wastewater treatment capacity and water recycling occurs strictly from the implementation of local plans for expansion, and the potential need to develop additional potable water supplies continues to be a regional challenge. In general, each Member Agency would continue to implement individual water recycling projects, subject to the availability of funding and completion of the environmental review process. The No Action Alternative would likely result in a smaller increment of water recycling projects within the region.

Proposed Action: The NBWRP Phase 2, or Proposed Action, builds upon the NBWRA's Phase 1 infrastructure investments, which included $104 million in treatment, distribution, and storage projects to develop recycled water as part of the region's water supply portfolio. Building on Phase 1 technology and infrastructure investments, the NBWRP Phase 2 would deliver increased yield through expanded treatment, new pipelines, and additional storage projects, while building resiliency into the region's long-term water supply through the use of recycled water. The Proposed Action would provide 4,885 acre-feet per year (AFY) of recycled water supply through construction of 19.8 miles of pipeline, additional pump stations, 10 acre-feet (AF) of storage and 4.87 million gallons per day (mgd) of WWTP tertiary treatment capacity.

Storage Alternative. The Storage Alternative would include the Proposed Action, as well as additional storage, treatment and distribution facilities to provide additional operational flexibility within individual Member Agency service areas. This alternative would include additional storage of 1,099 acre-feet (AF), treatment (0.85 mgd) and distribution facilities (11.0 miles) beyond the NBWRP Phase 2 to provide additional operational flexibility within individual Member Agency service areas. Implementation of this Alternative would result in an additional 1,934 AFY of recycled water compared to the Proposed Action, providing a total of 6,819 AFY of recycled water supply.

Table A6-1 in **Appendix 6** summarizes the elements of each of the three alternatives.

6.4 Alternatives Analysis

In accordance with the CEQA Guidelines, the alternatives considered in this EIR include those that 1) could accomplish most of the basic objectives of the project, and 2) could avoid or substantially lessen one or more of the significant effects of the project. To provide the appropriate context for this alternatives analysis, the project objectives and key significant effects are summarized below.

6.4.1 Project Objectives

As presented in Section 1.1.1, Purpose and Need of the Proposed Action, NBWRA developed the following objectives for the Proposed Action to promote the expanded beneficial use of recycled water in the North Bay region to:

1. Offset demands on potable supplies;
2. Enhance local and regional ecosystems;
3. Improve local, regional, and State water supply reliability;
4. Maintain and protect public health and safety;
5. Promote sustainable practices;
6. Support the sustainable management of groundwater basins, and;
7. Implement recycled water facilities in an economically viable manner.

6.4.2 Significant Effects

Chapter 3, Environmental Consequences, presents the impact analysis for the project alternatives. No significant and unavoidable environmental impacts are anticipated for projects under any of the alternatives considered. Based on the analysis presented in Chapter 3, implementation of the Proposed Action could result in significant short-term construction and long-term operational impacts to aesthetics, air quality, biological resources, cultural resources, energy, hazards and hazardous materials, water quality, surface water, groundwater, land use, noise, public services and utilities, recreational facilities, and traffic. The impacts would be reduced to a less-than-significant level by mitigation measures presented in Chapter 3. Following is a summary of the significant, but mitigable, environmental impacts identified per resource area that are considered in the evaluation of the alternatives to identify those that can avoid or reduce the environmental effects and still meet the basic project objectives.

There are no significant and unavoidable impacts anticipated for the Proposed Action; therefore, the alternatives are compared by assessing the impacts under each alternative to demonstrate environmental superiority. In general, the magnitude of significant impacts would be in proportion to the extent of facilities required under each of the alternatives. Greater infrastructure involves greater construction activities or construction over a larger area for a longer duration, as well as a greater extent of operational activities. **Table A6-2** in **Appendix 6** summarizes the potentially significant, but mitigable, impacts identified. In general, impacts would be the least for the least for the No Action Alternative, which has the least amount of infrastructure, and greatest for the Storage Alternative, which has the greatest amount of infrastructure. A summary of impacts is provided in **Appendix 6**.

6.4.3 Economic Feasibility

A summary of the NBWRP Phase 2 total, annual, and per AF costs along with the water supply (in AF) is provided in **Table 6-1**. Life cycle costs are calculated over a 50-year period of analysis using a 3 percent real discount rate. The discount rate reflects the time value of money, indicating that any future costs (or benefits) must be discounted by an appropriate rate for comparing alternatives based on a common point in time. Discount rates used by the utilities are typically the same as the borrowing rates expected over the next several years. While there is no consensus on a single borrowing rate, much of the industry data suggests that a rate of 3 percent would be appropriate and justified. However, to ensure that a change in this important assumption does not affect the conclusions, a sensitivity analysis for the discount rate within a range of 1.5 to 3 percent was performed and found that a discount rate change within this range had no material impact on our analyses and the resulting recommendations.

TABLE 6-1: NBWRP PHASE 2 LIFE CYCLE COSTS

Total Capital Costs	$75 million
Net Present Value	$111 million
Total Annual Costs	$4,3 million
Water Supply (AF)	4,885
Program cost per acre-foot	**$857**

Brown and Caldwell, 2017; ESA 2017,

All Phase 2 facilities are expected to have a service life of at least 50 years with proper maintenance; costs incurred after 50 years would be significantly discounted and were not considered in this analysis. Use of a real discount rate (inflation adjusted) alleviates the need to escalate NBWRP Phase 2 future costs for expected inflation. All NBWRP Phase 2 costs (i.e., capital and O&MR) were combined and brought back to their present value so that the project costs could be represented by a single number, the net present value. The annual costs were developed by including the annualized capital costs, annual O&M costs, and replacement or refurbishment costs for facilities with less than a 50-year life. The annual costs were then divided by the per year water benefits to obtain the NBWRP Phase 2 cost per AF.

The selected NBWRP Phase 2 would provide water at $857/AF. The life-cycle and per AF costs will be compared to other non-recycling projects to determine cost-effectiveness of the NBWRP Phase 2 for providing agricultural, urban, and environmental water supplies in the region.

6.4.4 Summary Cost Comparison

This section compares the NBWRP Phase 2 costs to the non-recycling project costs to determine the cost-effectiveness of the NBWRP Phase 2. **Table 6-2** summarizes the life-cycle costs and per AF costs of the NBWRP Phase 2 and non-recycling water supply projects. The table also presents the annual quantity of water delivered under each project option.

TABLE 6-2: SUMMARY COST COMPARISON

	NBWRP Phase 2	Import Water to MST Area (Napa County portion of Project area)
Total Capital Costs	$75,584,448	$119 million
Total Annual Costs	$4,318,772	$4.6[a] million
Supply (AF)	5,039	1,937
Dollar per acre-foot	**$857**	**$2,389**

NOTE:
[a] Total Annual Costs do not include O&M and replacement costs for these projects.

The NBWRP Phase 2 would cost $857 per AF to serve 4,885 AF to agricultural and urban users in the NBWRP area. Planning cost estimates for importing water to the MST area, with increased NBA imported water, are approximately $2,389 per AF, which is also more expensive than the NBWRP Phase 2 costs to provide the same amount of water to the MST area.

6.5 Summary of Comparison of Alternatives

The following analysis examines each of the proposed alternatives (i.e., No Project Alternative, No Action Alternative, the Proposed Action, and Storage Alternative) for their ability to meet the stated NBWRP Phase 2 objectives, their ability to reduce or avoid potential impacts, and their implementation costs. **Table 6-3** describes the ability of the alternatives to meet each objective listed above. In general, each of the alternatives has the ability to meet the stated Project Objectives. The No Project Alternative and the No Action Alternative would not be considered to meet the project objectives. The tradeoffs associated with implementing one alternative over another are summarized in **Table 6-4**.

TABLE 6-3: ABILITY OF NBWRP PHASE 2 ALTERNATIVES TO MEET PROGRAM OBJECTIVES

Program Objective	Proposed Action	Storage Alternative	No Action Alternative	No Project Alternative
Offset demands on potable supplies	**Yes.** Proposed Action would provide 4,885 AFY of recycled water for beneficial use. Water recycling alleviates demand on potable supplies, as well as imported Russian River supplies, by providing an alternate water supply.	**Yes.** Storage Alternative would provide 6,819 AFY of recycled water for beneficial use. Water recycling alleviates demand on potable supplies, as well as imported Russian River supplies, by providing an alternate water supply.	**Partial.** Individual projects reasonably anticipated to occur would provide 1,187 AFY of recycled water that could offset potable demand, but to a substantially lesser degree than any of the alternatives.	**No.** No projects that could offset potable demand would be implemented.
Enhance local and regional ecosystems	**Yes.** Provides potable demand offset of 4,885 AFY, reduces discharge to receiving waters, and provides 880 AFY to Bel Marin Keys and Lower Novato Creek for habitat enhancement.	**Yes.** Provides potable demand offset of 6,819 AFY, reduces discharge to receiving waters, and provides 880 AFY to Bel Marin Keys and Lower Novato Creek for habitat enhancement.	**Partial.** Provides reduce potential demand offset of 1,187 AFY, reduces discharge to receiving waters, and provides 880 AFY to Bel Marin Keys and Lower Novato Creek for habitat enhancement.	**No.** The Alternatives establish an allocation of recycled water to be used for habitat restoration; this would not be implemented under the No Project Alternative.
Improve local, regional, and State water supply reliability	**Yes.** Provides potable demand offset of 4,885 AFY for local surface and groundwater supplies, as well as imported Russian River supplies.	**Yes.** Provides potable demand offset of 6,819 AFY, for local surface and groundwater supplies, as well as imported Russian River supplies.	**Partial.** Provides reduce potential demand offset of 1,187 AFY, for local surface and groundwater supplies, as well as imported Russian River supplies.	**No.** No infrastructure would be implemented; there would be no improvement in water supply reliability.
Maintain and protect public health and safety	**Yes.** All treatment distribution and use of recycled water would be in compliance with Title 22.	**Yes.** All treatment distribution and use of recycled water would be in compliance with Title 22.	**Yes.** All treatment distribution and use of recycled water would be in compliance with Title 22.	**No.** No Proposed Action facilities would be implemented.
Promote sustainable practices	**Yes.** Provides potable demand offset of 4,885 AFY for local surface and groundwater supplies, as well as imported Russian River supplies. Recycles treated effluent that would be discharged to receiving waters. Provides reliable water supply that has low energy and cost requirements compared to new water supply sources.	**Yes.** Provides potable demand offset of 6,819 AFY for local surface and groundwater supplies, as well as imported Russian River supplies. Recycles treated effluent that would be discharged to receiving waters. Provides reliable water supply that has low energy and cost requirements compared to new water supply sources.	**Partial.** Provides potable demand offset of 1,187 AFY for local surface and groundwater supplies, as well as imported Russian River supplies, but to a lesser degree. Recycles treated effluent that would be discharged to receiving waters. Provides reliable water supply that has low energy and cost requirements compared to new water supply sources.	**No.** The No Project Alternative does not provide sustainable benefits or promote sustainable practices.
Support the sustainable management of groundwater basins	**Yes.** Provides potable demand offset of 4,885 AFY for local surface and groundwater supplies. Provides reliable water supply for non-potable uses that would otherwise be drawn, in part, from local groundwater basins.	**Yes.** Provides potable demand offset of 6,819 AFY for local surface and groundwater supplies. Provides reliable water supply for non-potable uses that would otherwise be drawn, in part, from local groundwater basins.	**Partial.** Provides potable demand offset of 1,187 AFY for local surface and groundwater supplies, but to a lesser degree. Provides reliable water supply for non-potable uses that would otherwise be drawn, in part, from local groundwater basins.	**No.** The No Project Alternative does not support local groundwater management. Groundwater would remain a source for non-potable uses in the region.
Implement recycled water facilities in an economically viable manner	**Yes.** Over the long-term, development of the water recycling facilities proposed under the Proposed Action is a cost-effective approach to addressing water supply issues. This alternative represents a lower cost than the Storage Alternative.	**No.** While projects under the Proposed Action would receive federal and State funding, the storage projects would not. These would be forced to rely upon local funding.	**No.** Individual projects that are reasonably anticipated to occur would be forced to rely only on local funding and would not receive federal and State funding.	**No.** No Proposed Action facilities would be implemented.

SOURCE: ESA 2017.

TABLE 6-4: TRADEOFFS ASSOCIATED WITH EACH ALTERNATIVE

Alternative	Benefits	Disadvantages
No Project Alternative	• No cost to individual Member Agencies • No adverse environmental impacts as a result of project construction and operation	• No additional recycled water for potable offset or habitat enhancement • No reduction of discharge to San Pablo Bay • No improvement of regional water supply reliability.
No Action Alternative	• Lower costs than Proposed Action and Storage Alternative	• Minimum amount of recycled water for potable offset and habitat enchantment • Projects would be implemented without federal and State funding • Minimal improvement of local water supply reliability
Proposed Action	• Lower cost than Storage Alternative • Fewest adverse environmental impacts • Meets all NBWRP Phase 2 objectives	• Does not realize maximum amount of recycled water for potable offset
Storage Alternative	• Maximum amount of effluent discharge reduction • Maximum amount of recycled water for potable offset and habitat enhancement	• Maximum cost, much of which is not covered by State or federal supplemental funds • Maximum impacts from construction; significant and unavoidable air quality impacts

SOURCE: ESA, 2017.

6.5.1 No Project Alternative

6.5.1.1 Ability to Meet Project Objectives

As noted in **Table 6-3**, the No Project Alternative fails to achieve any of the NBWRP Phase 2 objectives, which are directed at improving water supply reliability, supporting sustainable groundwater management, offsetting potable water demand, enhancing ecosystems, promoting sustainable practices, achieving economic viability, and protecting human health. Therefore, implementation of an alternative water program is required.

6.5.1.2 Environmental Effects

Implementation of the No Project Alternative would avoid the construction-related impacts and operational impacts identified for the Proposed Action. However, implementation of the No Project Alternative would not provide the benefits of water reclamation, which include recycled water use, potable supply savings, reduced reliance on surface and groundwater, reduced groundwater pumping, and habitat enhancement. Under current conditions, the No Project Alternative would not assist in alleviating current water reliability – either locally, regionally, or State-wide – particularly during peak demand periods. The No Project Alternative would not comply with State goals for water recycling and would not reduce or assist in management of discharges to San Pablo Bay.

Implementation of the No Project Alternative would amount to a continuation of the current conditions, which would not involve construction-related impacts, like those anticipated under the Proposed Action or Storage Alternative. All the other program alternatives would cause environmental impacts, which are discussed above and in **Chapter 3**; the impacts would not occur if the No Project Alternative were implemented. However, the No Project Alternative would fail to improve water quality and groundwater overdraft. Therefore, the No Project Alternative is not considered environmentally superior.

6.5.2 No Action Alternative

6.5.2.1 Ability to Meet Project Objectives

Implementation of the No Action Alternative would partially meet some the NBWRP Phase 2 objectives, as it assumes that a smaller subset of recycled water projects, providing approximately 1,187 AFY of recycled water, would be implemented. The No Action Alternative would not satisfy any of the NBWRP Phase 2 objectives to the degree provided by the Proposed Action and Storage Alternative, and would not meet the objective of implementing recycled water facilities in an economically viable manner, as no supplemental State or federal funding would be available to the Member Agencies. The No Action Alternative would have a subset of the impacts identified in **Chapter 3**, primarily associated with the construction of the facilities that individual Member Agencies would be able to implement without the benefit of regional coordination or federal funding.

The No Action Alternative would not involve the capital costs associated with the Proposed Action or Storage Alternative. However, it would not be the most economically superior alternative. Financial constraints would limit implementation to local projects (e.g., Petaluma would only implement the Urban Recycled Water Expansion) and these projects would be ineligible for federal or State funding.

6.5.2.2 Environmental Effects

Under the No Action Alternative, projects in the Novato SD, Petaluma, and American Canyon service areas would likely occur and provide approximately 1,187 AFY of recycled water. This represents approximately 3% of projected treated effluent discharged in 2025. Adverse environmental impacts associated with the construction of pipelines and pump stations would occur under the No Action Alternative, however to a lesser degree than the Proposed Action and Storage Alternative. The impacts would likely be shorter in duration and would affect fewer sensitive receptors than those expected under implementation of the Proposed Action, given the difference in scale between the alternatives. In general, construction-related emissions and impacts to air quality and increased ambient noise would result under the No Action Alternative. Similarly, the No Action Alternative would potentially affect cultural, surface water, or biological resources in these three service areas. The NBWRP service areas would experience some level of beneficial socioeconomic impact for all alternatives, with the exception of the No Project Alternative. However, this beneficial impact would be far more limited under the No Action Alternative.

Although the level of environmental impacts related to construction would be of a smaller scale, the No Action Alternative would not result in the level of potable offset for imported surface water, local surface water, and groundwater supplies that would be provided under the Proposed Action and Storage Alternative. Similarly, it would not substantially reduce the amount of treated effluent discharged to tributaries of North San Pablo Bay. Over time, it is expected that demand pressures on imported surface water, local surface water, and groundwater supplies would increase, and current water supply and delivery reliability issues would be exacerbated as growth under the approved General Plans within the NBWRP service areas occurs. The No Action Alternative would not take full advantage of a local, sustainable, and energy efficient water supply implementation. The tradeoffs associated with implementing one alternative over another are summarized in **Table 6-4**.

Because it would not substantially offset potable demand or reduce groundwater pumping, and would not significantly reduce or assist in management of effluent discharge to San Pablo Bay, the No Action Alternative is not considered environmentally superior.

6.5.3 Proposed Action

6.5.3.1 Ability to Meet Project Objectives

The Proposed Action would be consistent with the NBWRP Phase 2's stated objectives, as summarized in **Table 6-3.** From an economic standpoint, projected capital costs associated with the Proposed Action are estimated at $66.0 million, with annual operations and maintenance costs estimated a $1.3 million (Brown and Caldwell, 2017). This represents a lower cost than the Storage Alternative.

6.5.3.2 Environmental Effects

Based on the comparison of environmental effects in **Appendix 6**, the Proposed Action is the environmentally superior alternative in almost all resource areas. As noted in **Appendix 6**, there would be no significant and unavoidable impacts associated with the Proposed Action. Chapter 3 recommends measures to mitigate any significant impacts to a less-than-significant level. Effects on natural resources would be in proportion to the size and number of facilities proposed. Most of the adverse environmental impacts would be associated with construction activities. The Proposed Action requires construction of the least amount of infrastructure compared to the Storage Alternative; therefore, it would result in less construction-related impacts. The Proposed Action requires the least amount of storage, making use of existing storage or land available at the WWTPs. The tradeoffs associated with implementing one alternative over another are summarized in **Table 6-4**.

6.5.4 Storage Alternative

6.5.4.1 Ability to Meet Project Objectives

The Storage Alternative would be consistent with the NBWRP Phase 2 stated objectives, with one exception. It would provide a greater amount of recycled water to offset potable demand and increase water supply reliability. However, from an economic perspective, the Storage Alternative is not considered economically viable, as the storage elements which distinguish this alternative from the Proposed Action would not receive supplemental State and federal funding. This would represent an additional $125.9 million in construction costs and $1.9 million in annual operations and maintenance costs which the affected Member Agencies would need to cover with local funds or other undetermined funding sources.

6.5.4.2 Environmental Effects

Based on the comparison of environmental effects in Section 6.3, the Storage Alternative is not the environmentally superior alternative in most resource areas given the increased physical magnitude of its storage elements. For instance, this alternative would have the potential to disturb an additional 79 acres, as compared to the Proposed Action. This would generate more substantial impacts to resources, such as biological resources, cultural resources, and water quality (i.e., erosion). Also, due to additive nature of the Storage Alternative (i.e., the Proposed Action *plus* additional storage reservoirs) and potential for overlapping construction activities, it has been determined that this alternative would have significant and unavoidable impacts to air quality due to the potential exceedance of nitrogen oxides (NO_X) significance thresholds. Therefore, while the nature of the impacts would be of a similar sort as the Proposed Action, the severity of those impacts would be greater under the Storage Alternative. The tradeoffs associated with implementing one alternative over another are summarized in **Table 6-4**.

6.6 Potential Alternatives Considered but Not Carried Forward for Detailed Review

A number of potential alternatives to NBWRP Phase 2 were considered but not carried forward for more detailed review, as they failed to meet one or more of the criteria in the Feasibility Study screening process.

6.6.1 Importation of Water

6.6.1.1 Regional Importation Project for Napa County

For potable water importation into the region, expansion of the Department of Water Resources (DWR) North Bay Aqueduct (NBA) would be necessary. The capacity of the NBA is currently fully allocated. This would also entail identification and acquisition of additional State Water Project (SWP) entitlements to serve additional supplies to the NBWRA service areas. For cost comparison, the Phase 1 Feasibility Study (CDM, 2008) included expansion of the NBA to provide 1,937 AFY of imported water to Napa MST area. Facility expansion would require a series of new pipeline alignments and booster pump station from Barker Slough.

6.6.1.2 Ability to Meet Project Objectives

Table 6-10 at the end of this Section summarizes the ability of Imported Water Alternatives, both recycled and potable supplies, to meet the stated NBWRA Phase 2 objectives. Importation of recycled water into the NBWRA service area would have the potential to meet some of the objectives, in that it would provide a recycled water supply to offset the use of potable supplies for irrigation. However, it is not anticipated that these alternatives would provide a more sustainable or cost effective water supply, given the pipeline distances involved.

Fundamentally, these alternatives would not offset potable supplies currently used for irrigation. Rather, they would continue to use imported potable supplies to meet irrigation demands. These alternatives would not reduce the amount of treated effluent discharge to tributaries of North San Pablo Bay and would not provide a reliable habitat enhancement water supply for the Lower Novato Creek or Bel Marin Keys restoration projects. Additional importation of potable supplies would not improve the reliability to local water supplies, as SWP supplies are subject to drought year reliability.

6.6.1.3 Significant Effects

Importation of recycled water from an outside community would incur similar impacts as the alternatives discussed above. Impacts associated with pipeline construction would include short-term impacts to aesthetics, air quality, biological resources, cultural resources, hazards and hazardous materials, water quality, land use, noise, public services and utilities, and traffic. Pipeline construction could also result in temporary and permanent disturbance to jurisdictional wetlands and other waters, riparian habitat, special-status plant and animal species, and known or unknown cultural resources.

This alternative would cause lesser impacts to surface hydrology and reduce groundwater pumping; however, these effects would occur outside the NBWRA service areas and would not address groundwater pumping issues within these areas. Similarly, importing recycled water would not reduce wastewater discharge within the NBWRA service areas, since recycled water sources would lie outside these areas.

Importation of potable water would require additional infrastructure, which would result in construction-related environmental impacts and a potential increase in potable demand outside the NBWRA service areas. Importing potable water would not reduce wastewater discharge within these areas.

6.6.1.4 Economic Feasibility

Under this alternative, the Member Agencies would face the institutional constraints of developing an agreement to obtain either recycled water or potable water supplies, prepare the cost estimates associated with purchase of the water, and sharing the costs of

constructing new distribution infrastructure. Importing water from outside communities to individual service areas could require pipelines in excess of what would be required to develop recycled water supplies for Member Agencies. For example, if water were imported to SVCSD from a community located at greater distances from Napa or Sonoma, such as Santa Rosa or Windsor, approximately 55 to 65 miles of pipeline would need to be constructed. It would require approximately 20 to 30 miles of pipeline to connect SVCSD to the Novato SD Recycled Water Facility, or the Napa SD Soscol Water Recycling Facility. For cost comparison, the Phase 1 Feasibility Study (CDM, 2008) included expansion of the NBA to provide 1,937 AFY of imported water to Napa MST area. Facility expansion would require a series of new pipeline alignments and booster pump station from Barker Slough. The cost of long-term water supply is assumed to be approximately $12.1 million, a new distribution system cost is approximately $49.8 million and the NBA expansion cost is approximately$47.3 million (SCWA/USBR, 2008 updated to 2016 dollars). Napa County also estimates legal and administrative fees to implement this alternative would be approximately $10 million. Therefore, total costs would be approximately $119.1 million, which does not include annual O&M and maintenance costs. The costs for 1,937 AF of water to the MST area would be approximately $2,389 per AF (Brown and Caldwell, 2017). **Table 6-5** provides a comparison of Capital Costs and cost effectiveness of Alternatives to the Proposed Action.

6.6.2 Desalination

Desalination of saline water from San Pablo Bay would provide a reliable supply of water for irrigation. Currently, reverse osmosis (RO) treatment is the most cost-effective and feasible treatment option for desalination. The desalination plant could be sized and operated to provide a continuous source of supply. Due to the higher salinity of the source water and depending upon the efficacy of the RO process, the high salinity (approximately 35,000 milligrams per liter of total dissolved solids), a flow of 5,500 AF of source water would produce approximately 2,750 AF of desalinated water.[1] As such, higher feed pressure and need to increase the treatment capacity would result in a high electric power requirement.

TABLE 6-5: COMPARISON OF CAPITAL COSTS AND COST-EFFECTIVENESS FOR ALTERNATIVES TO THE PROPOSED ACTION

	NBWRA Phase 2	Import Water to MST Area (Napa County portion of Action Area)	Desalination
Total Capital Costs ($)	75,584,448	119,083,309	121,100,000
Total Annual Costs ($)	4,318,772	4,628,232*	7,100,000
Supply (AF)	5,039	1,937	2,750
Dollar per acre-foot	857	2,389	TBD

NOTE: * Total Annual Costs do not include O&M and replacement costs for these projects.

SOURCE: Brown and Caldwell 2017.

The Marin Municipal Water District (MMWD) explored the viability of a desalination project that would provide supply to the MMWD Service Area. Construction of a 5.0-mgd desalination plant was proposed, with the ability to expand capacity in 5.0-mgd increments, up to a maximum capacity of 15 mgd. The source water from San Pablo Bay would undergo several treatment processes in the facility, including solid removal, reverse osmosis, and disinfection and addition of materials for taste. The potable product water generated at the facility would have been 50 percent of the source water flowing into the facility. The brine produced in the RO process would be blended with treated wastewater prior to discharge into the Bay. The solids would be disposed in the Redwood Landfill north of Novato.

6.6.2.1 Ability to Meet Project Objectives

Table 6-6 presents a summary of the alternatives to NBWRP Phase 2 and their consistency with stated program objectives and an analysis of each alternatives' consistency with the objectives to support the decision to reject these alternatives. As noted above, some alternatives to the program would, in fact, be cost-effective; however, these alternatives do not achieve a majority of the program objectives.

6.6.2.2 Significant Effects

The environmental impacts associated with the desalination alternative would occur during construction of the project facilities similar to other alternatives. Construction activities would include construction of the RO plant, pipeline, and waterside facilities. Environmental impacts to aesthetics, ambient noise, and water quality are typically associated with desalination facilities.

[1] Assuming 50 percent efficacy, the RO process would generate 50 percent desalinated water of the source water.

TABLE 6-6: ABILITY OF POTENTIAL ALTERNATIVES TO MEET NBWRP PHASE 2 OBJECTIVES

	Alternatives of the Program			Alternatives to the Program		
				Importation of Water		Desalination
Objectives	**Proposed Action**	**Storage**	**No Action**	**Importation of Recycled Water**	**Importation of Potable Water (SWP via the NBA)**	**MMWD or SVCSD Plant**
Offset demands on potable supplies	**Yes**	**Yes**	**Partial**	**Yes.** If new infrastructure is established to convey recycled water from the outside community's treatment facility, importation and use of recycled water would offset potable water use in the action area.	**No**. If potable water (i.e. SWP water) is imported from an outside community, potable demand and impacts to surface water would be shifted to a different location, but would fail to offset potable demand.	**Yes**. Desalination of sea water would offset potable demand by processing seawater and not taking potable water from another source.
Enhance local and regional ecosystems	**Yes**	**Yes**	**Partial**	**Yes**. Although this alternative does not directly incorporate habitat restoration, it could result in reduced groundwater pumping, improve the groundwater overdraft situation, and contribute to improved stream flow hydrology and riparian habitat. However, this alternative would not reduce effluent discharge produced in the action area.	**Yes**. Although this alternative does not directly incorporate habitat restoration, it could result in reduced groundwater pumping, improve the groundwater overdraft situation, and contribute to improved stream flow hydrology and riparian habitat. However, this alternative would not reduce discharge produced in the action area.	**No.** Brine effluent discharge could affect aquatic ecosystems. This alternative does not allocate water for habitat restoration.
Improve local, regional, and State water supply reliability	**Yes**	**Yes**	**Partial**	**No.** Importation of recycled water would connect an outside community to part of the action area, but would not effectively reduce effluent discharge within the action area. It could improve water supply reliability within portions of the action area, but the effect on outside water supply reliability is unclear.	**No**. Increased reliance on potable water from another would not improve overall water supply reliability.	**Yes**. This alternative emphasizes local water supply. Seawater is an accessible and available water supply source.
Maintain and protect public health and safety.	**Yes**	**Yes**	**Yes**	**Yes.** Elements of the alternative would not compromise human health.	**Yes**. Elements of this alternative would not compromise public health.	**Yes**. Elements of this alternative would not compromise public health.
Promote sustainable practices	**Yes**	**Yes**	**Partial**	**No.** Although this alternative promotes reuse of water, it would potentially incur greater construction-related impacts.	**No**. Importation of potable water from an outside community would not holistically address water supply issues. It would require extensive construction, incur construction-related impacts, and have high capital costs.	**Yes**. Desalination would use seawater as source, and the impacts would most likely be mitigated to a less-than-significant level. However, it may not improve long-term sustainability of the regional water system or enhance sensitive ecosystems, from a water supply, groundwater management, or habitat restoration perspective.
Support the sustainable management of groundwater basins	**Yes**	**Yes**	**Partial**	**No.** Although the importation of recycled water from an outside community would offset any pumping from local groundwater basins, the groundwater basins which initially sourced the imported water would not be recharged in kind.	**No.** Although the importation of recycled water from an outside community would offset any pumping from local groundwater basins, the capacity of surface water sources to recharge aquifers in those areas would be reduced.	**Yes.** Desalination would use seawater as source and eliminate the need to draw from local groundwater basins for non-potable uses.

TABLE 6-6: ABILITY OF POTENTIAL ALTERNATIVES TO MEET NBWRP PHASE 2 OBJECTIVES (CONTINUED)

	Alternatives of the Program			Alternatives to the Program		
				Importation of Water		Desalination
Objectives	**Proposed Action**	**Storage**	**No Action**	**Importation of Recycled Water**	**Importation of Potable Water (SWP via the NBA)**	**MMWD or SVCSD Plant**
Implement recycled water facilities in an economically viable manner	**Yes**	**No**	**No**	**No.** While the importation of water from an outside community would possibly reduce future operations and maintenance costs for Member Agencies, there would be greater upfront costs to construct the infrastructure and undetermined costs for the supplier to provide the service.	**No.** While the importation of water from SWP would possibly reduce future operations and maintenance costs for Member Agencies, there would be greater upfront costs to construct the conveyance infrastructure and undetermined costs for the SWP to augment its source and provide the service.	**No.** The construction of the facility and follow-on operations and maintenance costs, as well as potential legal costs stemming from local opposition, would exceed that of either Action Alternative. Additionally, a substantial distribution system would be required to serve all Member Agencies.

Long-term effects would include water quality impacts from the discharge of the brine generated by the desalination process. The discharge would be dispersed by currents in San Pablo Bay, affecting temperature, nutrients, and turbidity and, therefore, the abundance and diversity of marine organisms. Areas of potential concern in relation to marine water quality include temperature, dissolved oxygen, or salinity; possible localized changes in currents or in turbidity, due to the presence of intake pipes on the ocean bottom or due to the pumping/discharge of effluents from the desalination plant; and possible changes in dispersion of sewage plume effluent due to added discharge of brine effluent from the desalination plant. As such, a desalination project would require a baseline study to establish offshore conditions prior to desalination plant startup; and perform quarterly marine water quality/biological monitoring in accordance with the San Francisco Bay Regional Water Quality Control Board requirements during operational phase. Implementation of a desalination plant would also require construction of new facilities, which would incur construction-related impacts similar to those anticipated under the Proposed Action. Therefore, the desalination alternative would have a similar level of temporary environmental impact when compared to the alternatives examined.

6.6.2.3 Economic Feasibility

The capital costs and operations and maintenance costs could be prohibitive: the estimated capital cost of the MMWD plant was estimated at $121.1 million, with annual operations and maintenance costs as high as $7.1 million. Further, there are high energy costs associated with this alternative in addition to the costs for land acquisition, construction of seawater intake and potentially a brine water discharge line and brine water outfall. In addition, considering the extremely high cost for desalination, coupled with its greater dependency on large quantities of power, this alternative was not carried forward for further analysis.

6.7 Environmentally Superior Alternative

The lead agency is not required by CEQA or NEPA to adopt an environmentally superior alternative that will not feasibly attain project objectives or reduce environmental effects. In the process of selecting the environmentally superior alternative, NBWRA has evaluated several factors, including environmental effects, engineering and operational criteria, system reliability and flexibility, cost, and efficient coordination with other water recycling efforts, in determining which alternative is the best project to approve and implement.

CEQA and NEPA require that a lead agency demonstrate why a project or an alternative is selected. This is provided in the findings document. The Proposed Action has been identified as the most environmentally, equitable, and financially sustainable alternative that will effectively fulfill the NBWRP Phase 2 objectives. The Proposed Action would provide adequate conveyance, pumping, and storage capacity that would result in 4,885 AFY of recycled water, thereby offsetting a substantial amount of potable demand and reducing wastewater discharge to San Pablo Bay. The Proposed Action would achieve all of the program objectives with least environmental impacts and costs, although it would not provide the benefits from increased storage provided under the Storage Alternative. The Proposed Action would have the capacity to provide recycled water to offset potable demand and improve water supply reliability. The Proposed Action appears to best meet the stated objectives of NBWRP Phase 2 for the following reasons:

1. The Proposed Action provides offset for demands on potable supplies, although not to the degree provided by the storage elements of the Storage Alternative.
2. The Proposed Action would provide the recycled water to the Lower Novato Creek and Bel Marin Keys restoration projects.
3. The Proposed Action would have reduced facility related impacts, particularly related to new storage facilities. The Proposed Action would avoid potential significant and unavoidable air quality impacts related to the Storage Alternative. Additionally, impacts related to disturbance of 72 acres to construct storage would be avoided. These include impacts in the issue areas of water quality, biological resources, cultural resources, and agricultural resources.
4. The Proposed Action would improve local, regional, and state water supply reliability, although not to the degree provided by the storage elements of the Storage Alternative.
5. The Proposed Action would maintain and protect public health and safety, as would all alternatives.
6. The Proposed Action would promote sustainable practices by providing recycled water, although not to the degree provided by the storage elements of the Storage Alternative.
7. The Proposed Action would promote sustainable management of groundwater basins by providing reliable water supply options for non-potable uses that would otherwise be drawn from local groundwater sources, although not to the degree provided by the storage elements of the Storage Alternative.
8. The Proposed Action is the least expensive, with the exception of the No Action and No Project alternatives.

The Proposed Action would improve water supply reliability with a major emphasis on local water use. Water reuse would provide environmental benefits by offsetting surface and groundwater use, reducing the need to develop additional water supplies, and reducing discharge to the Bay. Although an incrementally smaller amount of recycled water would be available, it would represent an economically feasible alternative. Implementing the Proposed Action would cost 56 percent less than the Storage Alternative. Since the Proposed Action would represent the lower cost Action Alternative and would be implemented with federal

and State funding support, it is the most cost-effective for the Member Agencies. The Proposed Action would require the least amount of new storage and rely on increasing treatment capacities at existing facilities and using ponds on existing WWTP sites.

Compared to the Proposed Action, the Storage Alternative would increase regional storage options and provide incrementally more recycled water treatment and distribution facilities, albeit with greater costs for the Member Agencies, construction impacts, and greater potential for conflict with natural resources. Therefore, the Storage Alternative is not the most environmentally superior alternative (see Table 6-8).

In general, both the Proposed Action and the Storage Alternative would meet the stated NBWRP Phase 2 objectives and comply with applicable regulations and policies. In relation to the stated program objectives and environmental impacts, the Storage Alternative would involve the greatest capital costs and maximum adverse environmental impacts due to the proportion of facilities that would be required. The benefit of reducing the amount of wastewater discharged to the Bay is counterbalanced by the environmental detriment caused during construction and facility operation; therefore, the Storage Alternative is not considered environmentally superior.

Based on the criteria set previously in this chapter for the alternatives analysis, with respect to its ability to meet the stated NBWRP Phase 2 objectives, its potential environmental impacts, and the cost of implementation, the Proposed Action is identified as the environmentally superior alternative. The Proposed Action would achieve the project objectives, result in lesser environmental impacts, and would incur lower costs. The Proposed Action would thus achieve all of the NBWRP Phase objectives while simultaneously providing a means for Member Agencies to achieve water management goals, meet future water demand, augment surface water use, and sustain environmental and water quality.

CHAPTER 7
Agency Consultation/Coordination

This chapter summarizes public and agency involvement activities undertaken by NBWRA and the Bureau of Reclamation that have been conducted to date for the Phase 2 Program, and which satisfy CEQA and NEPA requirements for public scoping and agency consultation and coordination. Appendix 1, presents the distribution list that identifies the entities receiving a copy of the Draft EIR/EIS. As noted previously, SCWA is acting as the Lead Agency under CEQA and Reclamation is the lead agency pursuant to NEPA.

Since the initial phases of North Bay Water Reuse Program (NBWRP) development, the NBWRA has engaged and consulted with agencies, stakeholders, landowners, and the general public. The consultations assisted the NBWRA in determining the scope of the EIR/EIS, identifying the range of alternatives and mitigation measures, and defining potential environmental impacts and impact significance. Consultation included informal agency communications, formal interagency meetings, and public meetings. The NBWRA will continue to solicit public and agency input on the Phase 2 Program by encouraging review of this EIR/EIS.

7.1 Stakeholder Consultation

In the Phase 2 Program, the communication strategy continues to involve informing and involving the public about the NBWRP, as well as engaging agencies and other stakeholders to partner and collaborate to move the program forward for public and agency review. To carry out these goals, the multi-phase public and stakeholder involvement process developed during the first phase of NBWRP to establish relationships with stakeholders and community awareness of the project has been continued into the Phase 2 Program. Starting in 2017, the NBWRA conducted meetings with lead agencies, city and county governments and local water agencies, and stakeholder groups. Outreach for the Phase 2 Program CEQA and NEPA review process included scoping meetings, newspaper notices, and continued postings on the NBWRA website.

The selection of projects for the NBWRP Phase 2 was completed as part of the iterative Feasibility Study process required under Reclamation's Title XVI Program. The NBWRP Phase 2 builds upon the NBWRP Phase 1 technology and infrastructure investments to further develop recycled water as part of the North San Pablo Bay region's water supply portfolio. The following summarizes the alternatives development process presented in the *North Bay Water Reuse Program Phase 2 Feasibility Study* prepared for NBWRA in June, 2017, by Brown and Caldwell.

A stakeholder-driven process including all 10 NBWRA Member Agencies was applied to select the suite of projects which would comprise the NBWRP Phase 2. NBWRP objectives and sub-objectives were used to screen and score the projects initially identified and to demonstrate the qualitative and quantitative value each project would contribute to meeting these objectives. Using that refined list of projects, the process was re-applied to include screening and valuation to formulate NBWRP Phase 2 alternatives.

The initial activity was to develop appraisal-level project layouts and costs for initial screening purposes. The first screening removed projects that would not be implemented in the near-term and projects that were not directly sponsored by the NBWRA Member Agencies. The remaining projects were then scored against the NBWRP objectives with total costs applied. A sensitivity analysis was then conducted to address other benefits beyond total costs that a project may provide to the NBWRP.

These alternatives were further evaluated, resulting in a combination of projects that best addressed the NBWRP objectives. This more focused evaluation includes project refinement, a cost-feasibility analysis, and a final evaluation by each Member Agency of the projects proposed by each. This iterative process yielded the NBWRP Phase 2, or the "Proposed Action", evaluated in this Draft EIR/EIS.

7.2 Notice of Preparation and Notice of Intent

The NBWRA prepared and distributed notification packages to inform interested parties of the scoping period and public scoping meetings to inform the evaluation of the Phase 2 Program pursuant to CEQA and NEPA.

On July 19, 2017, NBWRA (with SCWA as Lead Agency) published and distributed a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) to advise interested agencies and the public. The NOP was directly mailed to 237 government agencies and officials, and interested parties, and a postcard notification of the NOP's availability was sent to 425 parties. On,

November 6, 2017, Reclamation published a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in the *Federal Register* to advise interested agencies and the public of the public comment period.

7.3 Scoping Activities

Public scoping activities are conducted as part of compliance with both NEPA and CEQA. Scoping is intended to assist in identifying the final range of actions, alternatives, site design options, environmental resources, and mitigation measures that will be analyzed in an environmental document. The scoping process helps ensure that problems are identified early and properly studied and also helps to eliminate from detailed study those issues that are not critical to the decision at hand.

7.3.1 Public Noticing

With publishing of the NOP, the 30-day scoping comment period under CEQA extended from July 21, 2017 through August 21, 2017. The scoping comment period under NEPA commenced on November 6, 2017, with publishing of the NOI in the *Federal Register* and ended on December 6, 2017. During these two scoping periods, the public and regulatory agencies were given the opportunity to submit written comments on the scope, content, and format of the Phase 2 Program and environmental analysis by mail, fax, email, or website submittal to representatives at SCWA, Reclamation, or through the NBWRA's program website.

With regard to the postcard mailing mentioned above, the postcards were sent directly to public agencies/officials, property owners and occupants within 300 feet of the proposed SVCWD and SCWA project routes and locations, as well as individuals that had previously shown interest in the initial Phase 1 Program. This noticing process was conducted in manner consistent with each member agencies' preferences and public noticing requirements.

In the form of display advertisements, newspaper notices announcing the release and availability of the NOP and the scoping meeting schedule were posted in newspapers of public record in the NBWRA service area. These included: the *Sonoma Index-Tribune* on July18, 2017*;* the *Santa Rosa Press Democrat, Marin Independent Journal, (Vallejo) Times-Herald, and the Napa Valley Register* on July 19, 2017; and the *Petaluma Argus-Courier* on July 20, 2017. The advertisements announced SCWA and Reclamation's intention to prepare an EIR/EIS, and included details such as the locations and times of the scoping meetings, SCWA and Reclamation contact information, and the availability of information on the NBWRA website.

The announcement was also sent out as a press release through SCWA's media outreach list to multiple press organizations, stakeholders, elected representatives, television, and radio outlets and was posted on NBWRA's website. Finally, public libraries within the Phase 2 Program area also received the NOP to make available for public review.

7.3.2 Scoping Meetings

During the public scoping process, the NBWRA and SCWA conducted formal scoping meetings to gather input and comments prior to the development of the EIR/EIS. Four meetings were held at the locations below. One member of the public and four public officials attended the four meetings, which were held as follows:

August 2, 2017	August 3, 2017	August 9, 2017	August 10, 2017
6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. – 8:00 p.m.	6:30 p.m. - 8:00 p.m.
San Rafael Community Center, 618 B Street, San Rafael	American Canyon City Hall (Council Chambers) 4381 Broadway, American Canyon	Petaluma Community Center 320 N. McDowell Blvd., Petaluma	Sonoma Community Center 276 East Napa Street, Sonoma

The format of each public scoping meeting program was conducted in an open forum format. Each meeting began with a 30-minute open house during which participants could view exhibit boards with project information including an overview of the regional context, project objectives and purposes, possible alternatives, environmental issues, and the environmental review process. Participants were also encouraged to ask informal questions of project team members to understand the project objectives and alternatives.

Participants were encouraged to sign in and were provided with materials including an agenda, presentation slides, and a comment card. Copies of the NOP were available upon request. A formal 20-minute presentation focused on the Phase 2 Program, the environmental review process, schedule, and role of public comments. Following the presentation, time was allotted for public comments on the scope, content, and format of the environmental document. Comments were accepted in writing and project team staff recorded oral comments.

7.3.3 Scoping Report

A Scoping Report was prepared for the NBWRA Agency Members and Reclamation to document the scoping process and comments received. The report included an overview of scoping requirements, a summary of all comments made during the scoping process (written and verbal), a description of the issues anticipated to be addressed in the EIR/EIS, and an appendix that included printed copies of all written comments, summaries of the scoping meetings, and other project-related print materials used to inform interested parties about the Proposed Action, project alternatives, and the EIR/EIS.

7.4 Additional Public and Other Engagement in the Environmental Review Process

In accordance with CEQA and NEPA, this EIR/EIS will be circulated for public and agency review and comment for a 45-day period following the publishing of the Notice of Availability (NOA) of the EIS by Reclamation, and filing of the Notice of Completion (NOC) with the California State Clearinghouse by SCWA or NBWRA.

Similar to the approach to public scoping, four public hearings have been scheduled at the same scoping meeting venues to receive public input on the Draft EIR/EIS. These public hearings will be held during the public comment period so that any comments received at the meetings can be addressed in the Final EIR/EIS. In addition, written comments from the public, reviewing agencies and stakeholders will be accepted during the public comment period. Following consideration of these comments, a Final EIR/EIS will be prepared and circulated per NEPA and CEQA requirements that will include responses to all comments. SCWA and Reclamation will use the Final EIR/EIS when considering approval of the Proposed Action or an alternative. If the Proposed Action or other alternative is approved, SCWA will accept CEQA findings and issue a Notice of Determination (NOD) and Reclamation will issue a Record of Decision (ROD) to document that decision.

7.5 Ongoing Agency and Stakeholder Consultation and Coordination

SCWA and Reclamation will continue to engage interested agencies and stakeholders throughout the NEPA, CEQA, and project permitting processes. SCWA will meet as needed with other agencies with potential jurisdiction over the Proposed Action, including U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, State Water Resources Control Board, California State Office of Historic Preservation, California Department of Public Health, Bay Area Air Quality Management District, area tribal organizations, and others.

7.6 Compliance with Federal Statutes and Regulations

This section describes the status of compliance with the relevant federal laws, executive orders, and policies, and the consultation that has occurred to date or will occur in the near future. **Table 7-1** summarizes the status of consultation for the requirements that must be met by Reclamation and SCWA and/or individual Member Agencies prior to implementation of the Proposed Action. Most of these regulations involve ongoing compliance, which would occur in coordination with preparation of this EIR/EIS. Chapter 3 of this EIR/EIS describes the project impacts.

7.6.1 Federal Endangered Species Act

Pursuant to the Federal Endangered Species Act (FESA), U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have authority over projects that may result in take of a federally listed species. Under FESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS has also interpreted the definition of "harm" to include significant habitat modification that could result in take. If there is a likelihood that a project would result in take of a federally listed species, either an incidental take permit, under Section 10(a) of FESA, or a federal interagency consultation, under Section 7 of FESA, is required.

Either an Action Specific Implementation Plan (ASIP) or a Biological Assessment (BA) could be used to address the FESA and California State Endangered Species Act and the California Natural Community Conservation Planning Act (NCCPA) consultation requirements of federal and state agencies. Because the BA to be prepared for the selected project alternative focuses on issues specific to the Proposed Action, it will therefore address the biological assessment requirements. Reclamation will initiate formal consultation with USFWS and NMFS. USFWS and NMFS will then use the BA to develop biological opinions relative to the Proposed Action. The California Department of Fish and Wildlife (CDFW) will use the BA to address compliance with the California Endangered Species Act and the NCCPA.

TABLE 7-1: SUMMARY OF ENVIRONMENTAL COMPLIANCE FOR THE PROPOSED PROJECT

Requirements	Status of Compliance/Expected Completion
National Environmental Policy Act	Ongoing until this EIR/EIS Record of Decision is published
California Environmental Quality Act	Ongoing until this EIR/EIS document is certified and mitigation met
Executive Order 13807 – Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects	In compliance, as the Draft EIR/EIS meets the 300-page requirement for complex projects, as defined by the U.S. Bureau of Reclamation.
Federal Endangered Species Act and California Endangered Species Act	Ongoing until project Biological Opinion issued (see Section 3.6, Biological Resources)
Magnuson-Stevens Fishery Conservation and Management Act	Ongoing until project Biological Opinion or ASIP issued (see Section, 3.6 Biological Resources)
Clean Water Act Section 401	SCWA will apply for Water Quality Certification after EIR/EIS is approved and project design underway (see Sections 3.5, Water Quality and 3.6, Biological Resources)
Clean Water Act Section 404	SCWA will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.6, Biological Resources)
Clean Air Act	In compliance. Conformity analysis is not required. (see Section 3.9, Air Quality)
National Historic Preservation Act and Native American Consultation	Ongoing. Once Section 106 review process is completed, the project will proceed in accordance with conditions stipulated in the agreement with the State Historic Preservation Officer and appropriate agencies (see Section 3.14, Cultural Resources)
Executive Order 11988 - Floodplain Management	Ongoing. The project complies by using this EIR/EIS to identify and assess project effects (see Section 3.3, Surface Hydrology)
Executive Order 11990 - Protection of Wetlands	SCWA will apply for Wetland Permit after the EIR/EIS is approved and project design underway (see Section 3.6, Biological Resources)
Executive Order 12898 - Environmental Justice	In compliance based on EIR/EIS Section 3.18, Environmental Justice.
Migratory Bird Treaty Act	Reclamation and SCWA will comply with provisions of the Migratory Bird Treaty Act (see Section 3.6, Biological Resources)
California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement Program)	Ongoing. The project complies with Section 1600 by using this EIR/EIS to identify and address expected project effects (Section 3.6, Biological Resources)
Caltrans Encroachment Permit	SCWA will apply for a Caltrans Encroachment Permit to construct within Caltrans right-of-way prior to construction (see Section 3.8, Transportation and Traffic)
Disabilities Regulations - Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act	Project adheres to the construction guidelines of the Uniform Federal Accessibility Standards and complies with regulations proposed for incorporation into the Americans With Disabilities Act Accessibility Guidelines as a part of design for individual facilities.
Farmland Protection Policy Act	Ongoing. (see Section 3.7, Land Use and Agricultural Resources)
Section 10 of the Rivers and Harbors Act of 1899	Ongoing. This regulation is addressed in coordination with other wetlands regulations (see Clean Water Act, Section 404, above)
NPDES Construction Stormwater Permit	SCWA will comply by preparing and using a Storm Water Pollution Prevention Plan at the time of construction (see Section 3.3, Surface Hydrology)
General Order for Dewatering and Other Low Threat Discharge to Surface Waters	SCWA will comply by preparing and using a permit at the time of construction (see Section 3.3, Surface Hydrology)

7.6.2 Clean Water Act

The Clean Water Act (CWA) is the primary surface water protection legislation throughout the country. The CWA aims to restore and maintain the chemical, physical, and biological integrity of surface waters to support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." The U.S. Environmental Protection Agency (EPA) is the Federal agency with primary authority for implementing regulations adopted pursuant to the CWA, and has delegated the authority to implement and oversee most of the programs authorized or adopted for CWA compliance to U.S. Army Corps of Engineers (USACE) and the Regional Water Quality Control Boards (RWQCB).

7.6.3 Section 10 of the Rivers and Harbors Act of 1899

Under Section 10 of the Rivers and Harbors Act of 1899, the construction of structures in, over, or under, excavation of material from, or deposition of material into "navigable waters" are regulated by USACE. Navigable waters of the United States are defined as those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark or those that are currently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. A Letter of Permission or permit from the USACE is required prior to any work being completed within navigable waters. NBWRA Member Agencies will obtain the necessary permits from USACE prior to beginning any project-related work in navigable waters.

7.6.4 Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended in 1992) requires Federal agencies to evaluate the effects of Federal undertakings on historical, archaeological, and cultural resources, and to consult with the Advisory Council on Historic Preservation concerning potential effects of Federal actions on historic properties. Before Federal funds are approved for a particular project or prior to the issuance of any license, the effect of the project on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register shall be evaluated.

To comply with the NHPA, notices of public meetings for this project will be sent to the State Historic Preservation Officer (SHPO), which acts as an intermediary for the Advisory Council on Historic Preservation. A copy of this Draft EIR/EIS will be sent to SHPO, as a unit of the California Department of Parks and Recreation, requesting its review and soliciting input on the project. SCWA and Reclamation will coordinate with the Advisory Council on Historic Preservation and SHPO, consistent with Section 106 of the NHPA. A Phase I Cultural Resources Report has been prepared and submitted to Reclamation. Reclamation will use these document to complete Section 106 Consultation with SHPO.

Native American Consultation. Implementing regulations for Section 106 require that Federal agencies identify potentially affected Indian tribes that might have knowledge of sites of religious and cultural significance in the area of potential effects (APE) (36 CFR 800.3[f][2]). Tribal contact and consultation conducted for NBWRP Phase 2 is discussed in Section 3.14. Section 8 address Indian Trust Assets.

7.6.5 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact of Federal programs with respect to the conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, Federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. The Natural Resources Conservation Service (NRCS) is the agency primarily responsible for implementing the FPPA. Agricultural resources are addressed in Section 3.7, Land Use and Agricultural Resources. SCWA and Reclamation will submit this EIR/EIS to the NRCS for comment.

7.6.6 Executive Order 11988 (Floodplain Management)

Executive Order 11988—Floodplain Management (May 24, 1977) directs Federal agencies to issue or amend existing regulations and procedures to ensure that the potential effects of any action it may take in a floodplain are evaluated and that its planning programs and budget requests reflect consideration of flood hazards and floodplain management. Guidance for implementation of the Order is provided in the floodplain management guidelines of the U.S. Water Resources Council (40 CFR 6030; February 10, 1978) and in *A Unified National Program for Floodplain Management*, prepared by the Federal Interagency Floodplain Management Taskforce. SCWA and Reclamation have considered Executive Order 11988 in their development of this EIR/EIS and have complied with this order.

7.6.7 Executive Order 11990 (Protection of Wetlands)

The purpose of Executive Order 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, the Order requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to:

1. acquisition, management, and disposition of Federal lands and facilities construction and improvement projects which are undertaken, financed or assisted by Federal agencies; and
2. Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

SCWA and Reclamation have considered Executive Order 11990 in their development of this EIR/EIS and have complied with this order. SCWA has taken a number of actions to minimize project effects on wetlands (see Section 3.5, "Biological Resources") and will be pursuing a Clean Water Act Section 404 permit from USACE.

7.6.8 Executive Order 12898 (Environmental Justice)

Executive Order 12898, Section 2-2, requires all Federal agencies to conduct programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color or national origin. Section 1-101 requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations. This Draft EIR/EIS has identified and described the project's potential to result in disproportionately high and adverse human health or environmental effects on minority and low-income populations (see Section 3.18, Environmental Justice), as required by this order.

CHAPTER 8
Indian Trust Assets

8.1 Background

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Federally recognized Indian tribes or individual Indians. An Indian trust has three components: (1) the trustee, (2) the beneficiary, and (3) the trust asset. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with trust land. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the United States is the trustee. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the United States. The characterization and application of the United States trust relationship have been defined by case law that interprets Congressional acts, executive orders, and historic treaty provisions.

8.2 Finding

There are no Indian reservations, rancherias, or allotments in the NBWRP Phase 2 area. The Proposed Action does not have a potential to affect ITAs. See Appendix 8 for Reclamation's ITA determination.

CHAPTER 9
Other NEPA Considerations

9.1 Irreversible and Irretrievable Commitments of Resources

NEPA Section 102(2)(c)(v) and 40 CFR 1502.16 requires that an EIS include a discussion of the irreversible and irretrievable commitments of resources which may occur should the project be implemented. Similarly, the CEQA Guidelines require a discussion of the significant irreversible environmental changes which would be involved in the project should it be implemented. Significant irreversible environmental changes under CEQA are identified as potentially significant and unavoidable impacts in Chapter 3 of this EIR/EIS.

Irreversible commitments of resources are those which cause either direct or indirect use of natural resources such that the resources cannot be restored or returned to their original condition. For example, the extirpation of a species from an area is an irreversible commitment. Construction activities associated with the Phase 2 Program would result in an irretrievable and irreversible commitment of natural resources though direct consumption of fossil fuels and use of materials. The proposed activities would require connections to existing power sources, which would increase the short-term use of electricity and refined petroleum products during the operation of construction equipment (primarily gas, diesel, and motor oil). However, the energy consumption for construction would not result in long-term depletion of non-renewable energy resources and would not permanently increase reliance on energy resources that are not renewable. Construction activities would not reduce or interrupt existing electrical or natural gas services such that existing supplies would be constrained.

Depending upon the Phase 2 Program elements, the Proposed Action and the Storage Alternative would result in progressively greater irreversible and irretrievable commitment of energy and material resources during project construction, operation, and maintenance, in the following forms:

1. Energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles, and during operation of additional treatment processes at the wastewater treatment plants;
2. Construction materials;
3. Labor;
4. Conversion of land uses; and
5. Biological resources; sensitive habitat and species, including fisheries.

The use of the nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region. Additional information on is available in **Sections 3.6**, **Biological Resources**; **3.7**, **Land Use and Agricultural Resources**; and **3.17, Energy Conservation**.

9.2 Relationship of Short-Term Uses and Long-Term Productivity

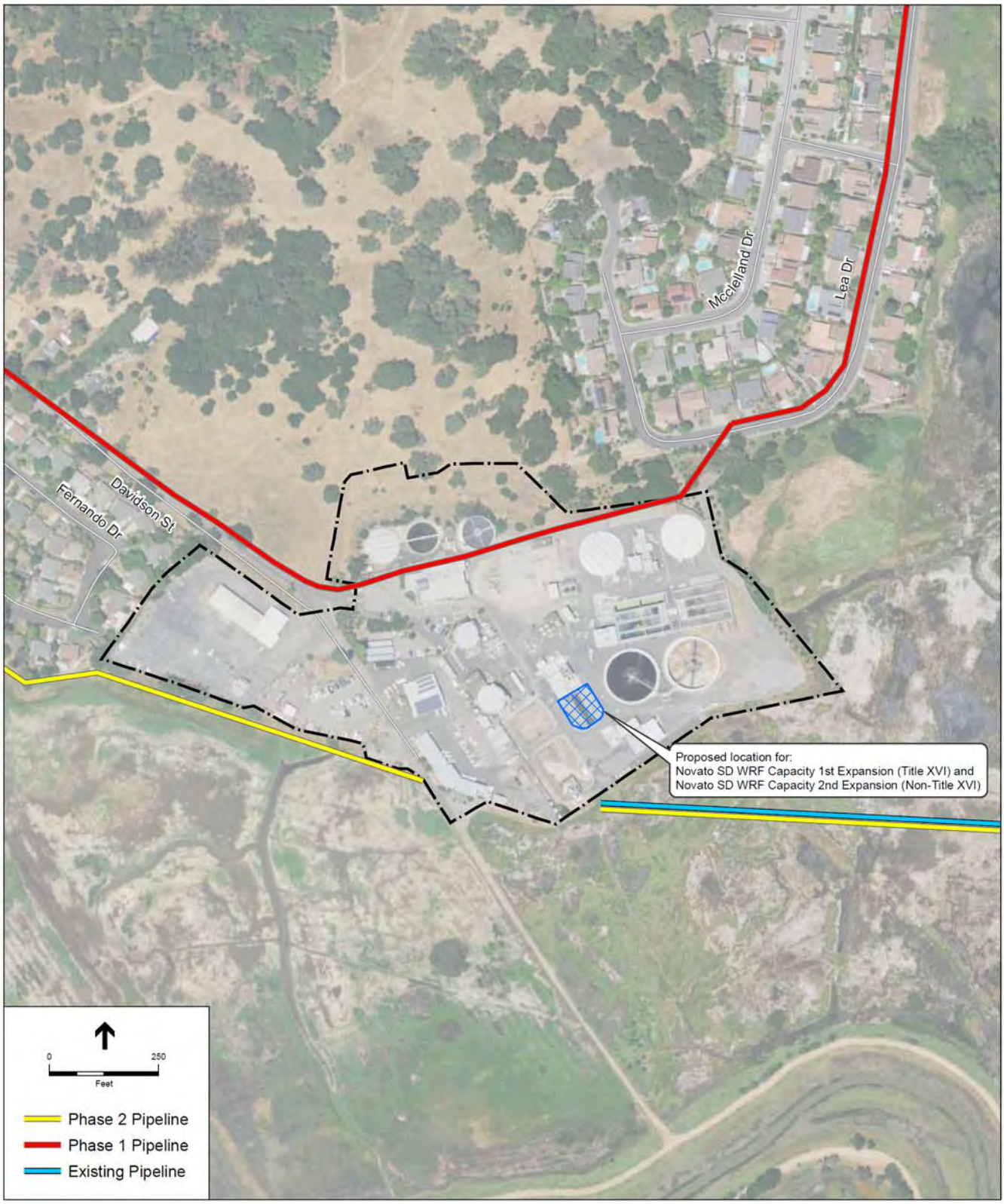
NEPA Section 102(2)(c)(iv) and 40 CFR 1502.16 requires that an EIS include a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. This section describes how the Proposed Action would affect the short-term use and the long-term productivity of the environment.

In reference to the Proposed Action, "short-term" refers to the temporary phase of construction of elements of the Phase 2 Program, while "long-term" refers to the operational life of each element and beyond. Chapter 3 of this EIR/EIS provides the short-term and long-term effects that could result from the Proposed Action.

Construction of the Proposed Action would result in short-term construction-related impacts, such as interference with local traffic and circulation, limited air emissions, increase in ambient noise levels, dust generation, disturbance of wildlife, increased storm runoff, and disturbance of recreational and other public facilities. These impacts would be temporary and would occur only during construction. They are not expected to alter the long-term productivity of the natural environment.

The Proposed Action would assist in the long-term productivity of the environment by improving the reliability of the water supplies in the NBWRP area by offsetting potable water sources that are used for non-potable purposes, such as irrigation. It would assist in the long-term productivity of the environment by reducing discharge into the San Pablo Bay and utilizing the treated wastewater as a resource for recycled water use and promoting sustainable management of groundwater basins. The Proposed Action would also result in enhancing the long-term productivity of local and regional ecosystems, such as the Lower Novato Creek basin or the Bel Marin Keys restoration area, by providing recycled water to restore their wetland and flood control functions. These long-term beneficial effects of the Proposed Action would outweigh the potentially significant short-term impacts to the environment resulting primarily from project construction.

Appendix A
Figures

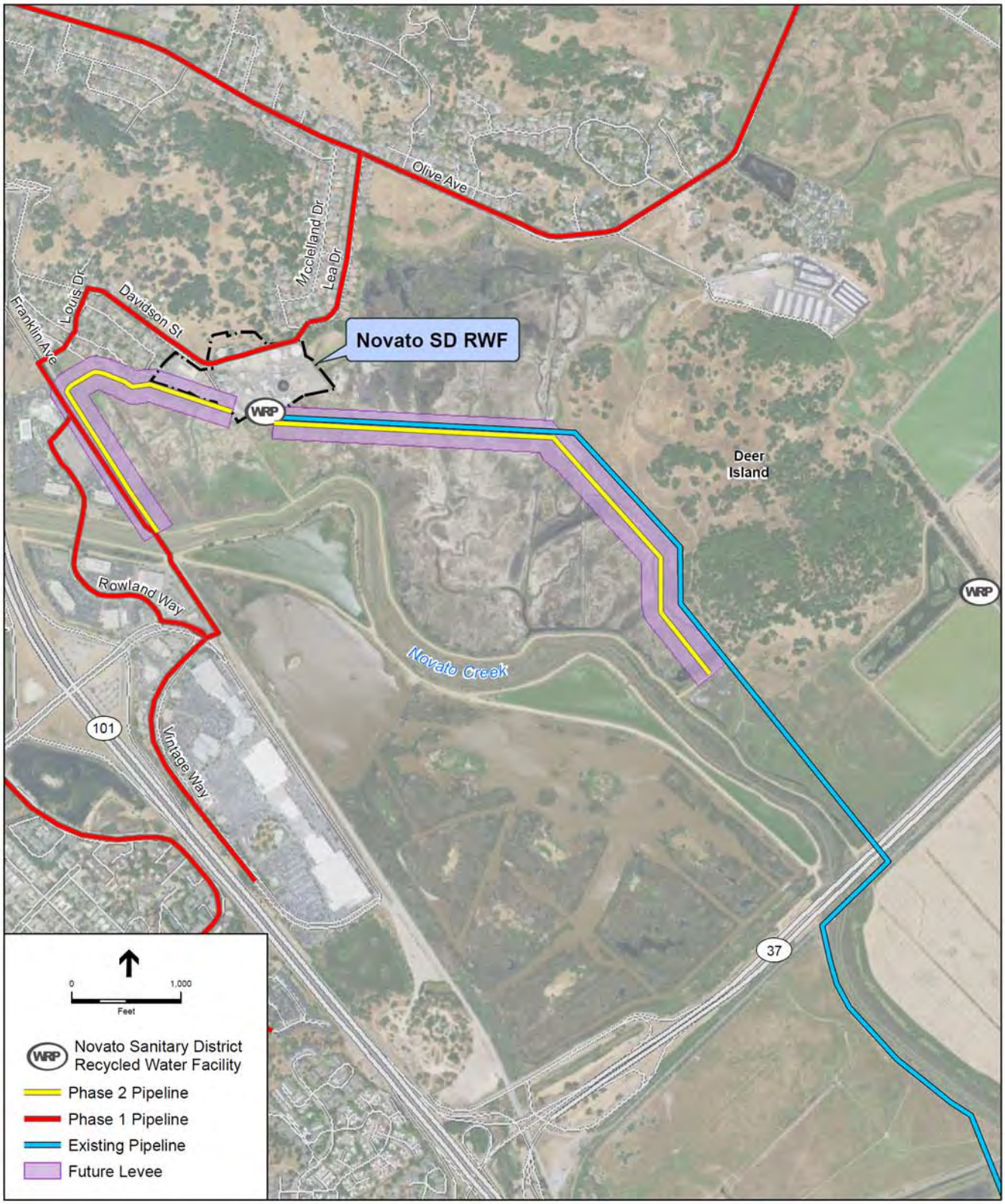


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-4

Novato Sanitary District Recycled Water Facility Capacity Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-5

Marin County Lower Novato Creek Project 1 - Distribution

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-6

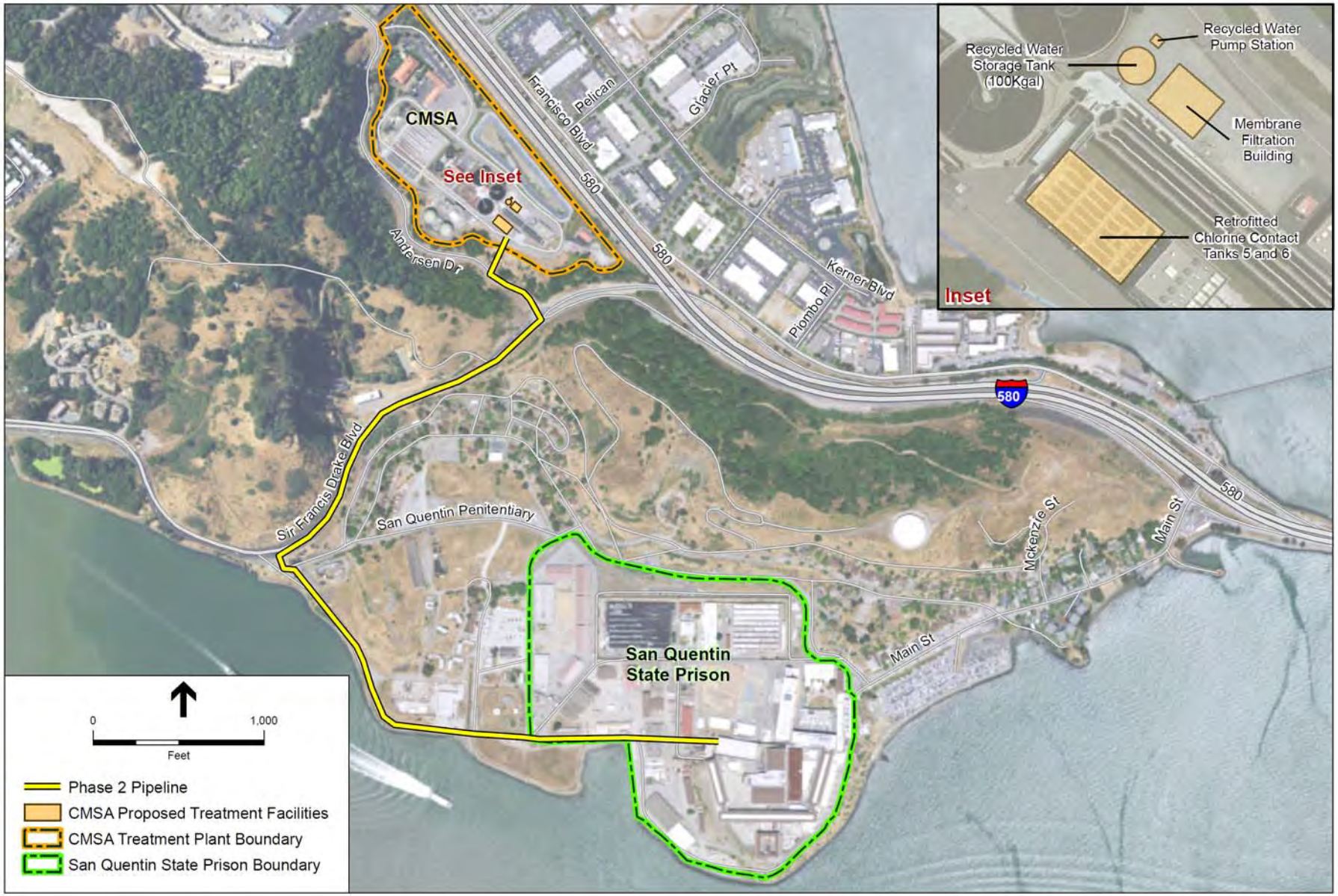
Turnout to Transitional Wetlands

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-7

SVCSD Napa Road Pipeline



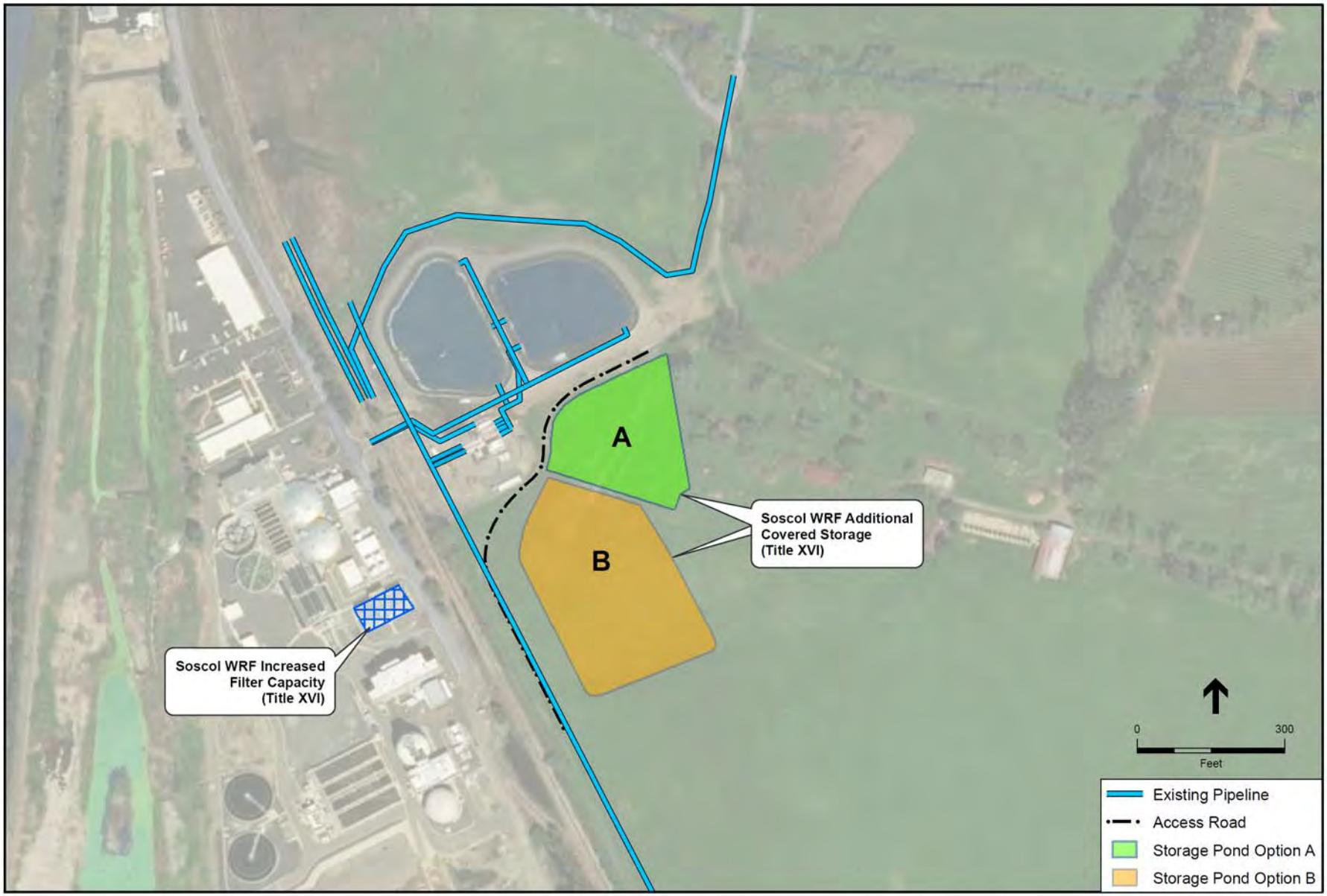
Note: CSMA= Central Marin Sanitation Agency

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-8

Marin Municipal Water District
Recycled Water Distribution
Expansion to San Quentin State Prison



SOURCE: North Bay Water Reuse Authority

Figure 2-9

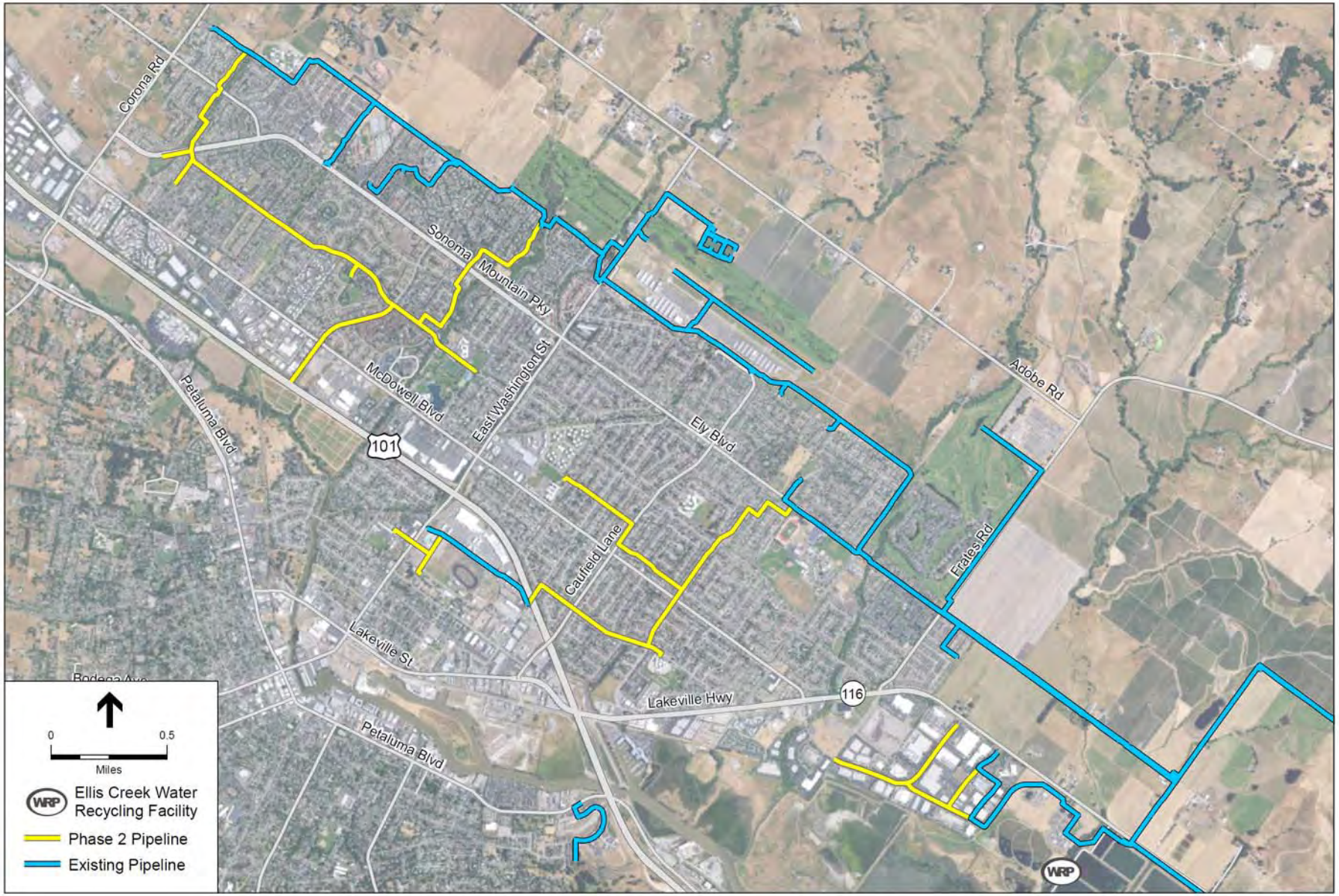
Soscol Water Recycling Facility Increased Filter Capacity and Additional Covered Storage Options A and B

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-10

Ellis Creek Water Recycling Facility Increased Capacity



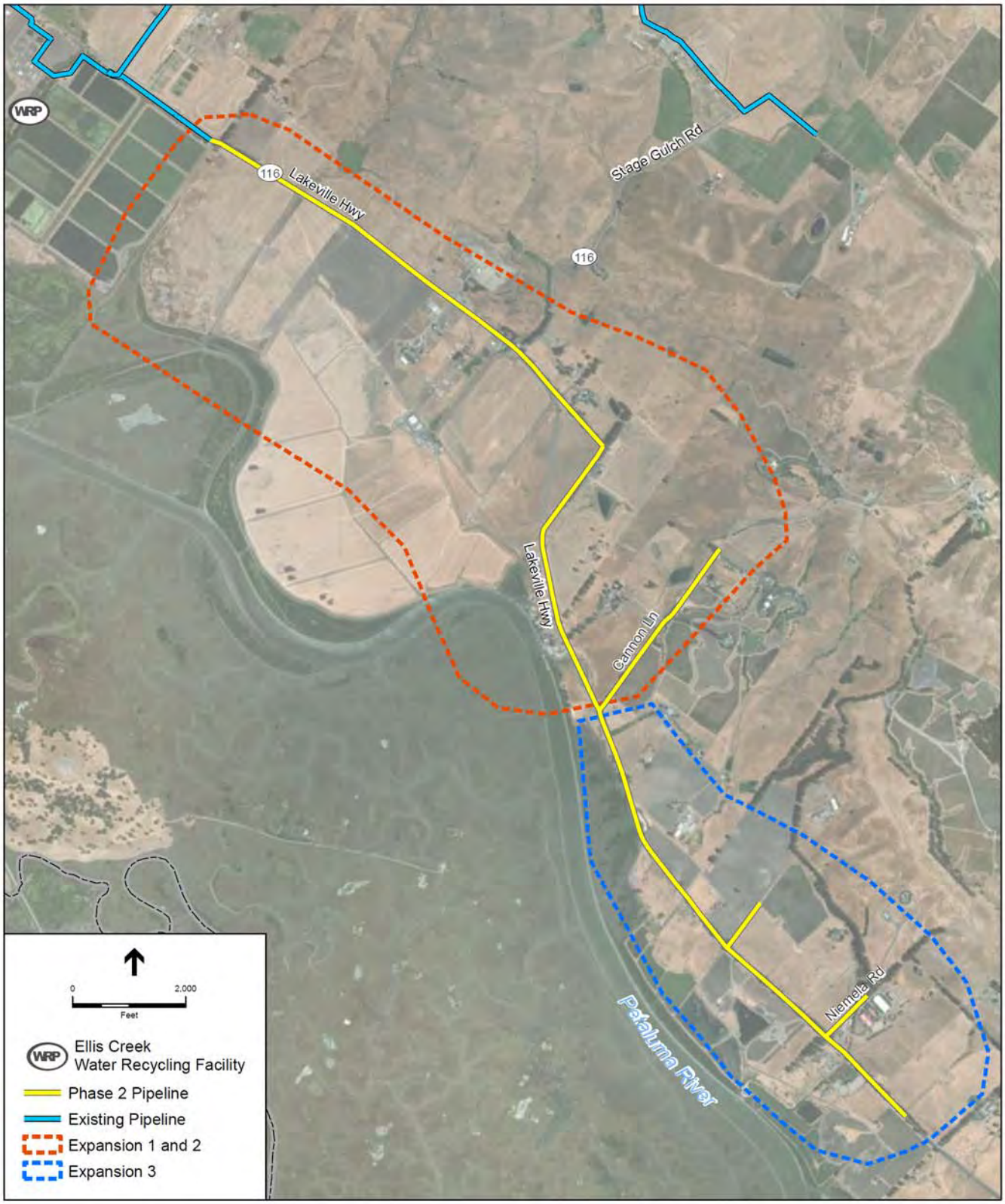
SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-11

City of Petaluma

Urban Recycled Water Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

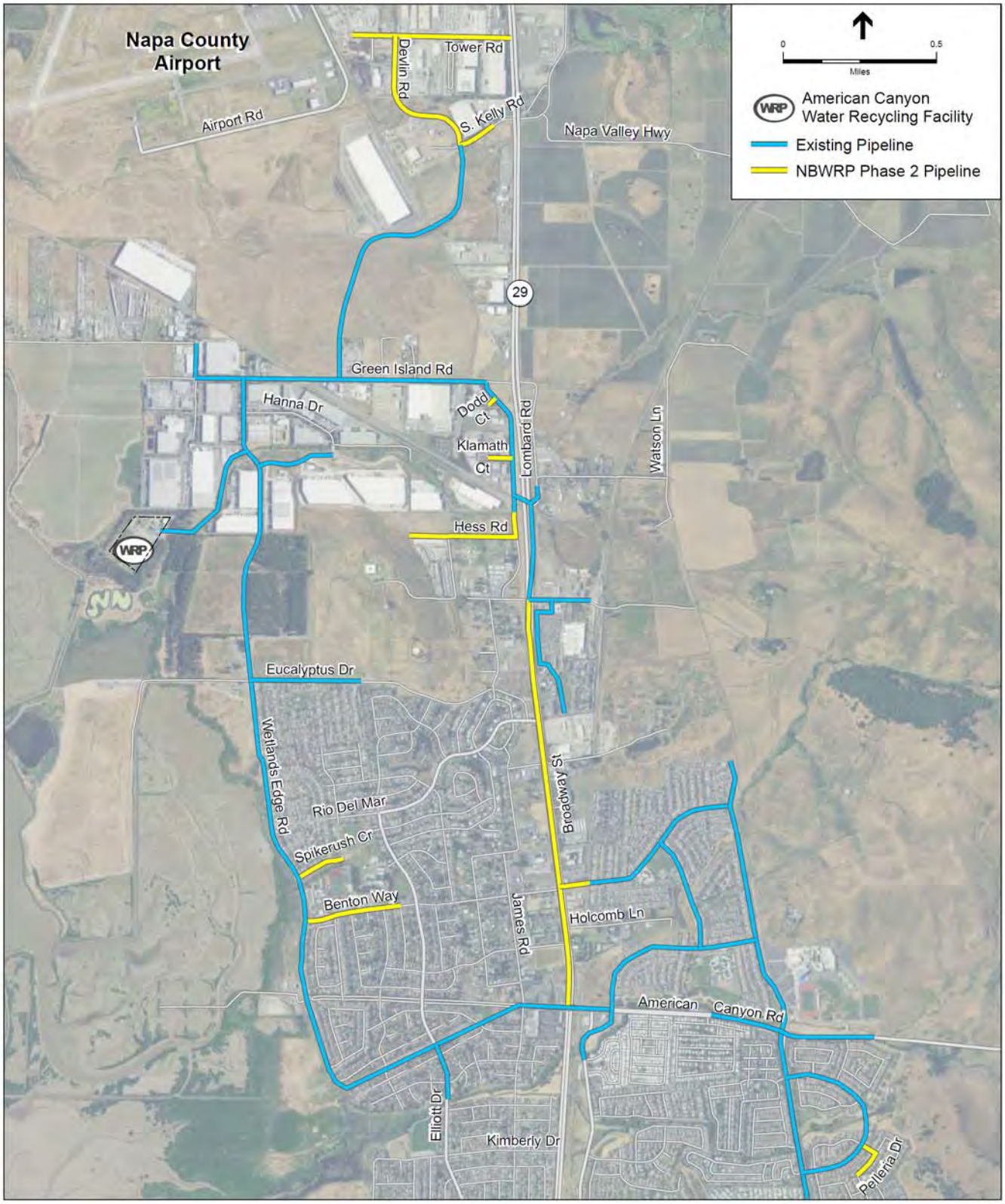
Figure 2-12
City of Petaluma
Agricultural Recycled Water Expansion
Phases 1, 2, and 3

SOURCE: North Bay Water Reuse Program

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-13

City of American Canyon Water Recycling Facility
Phase 2 Treatment Plant Upgrades

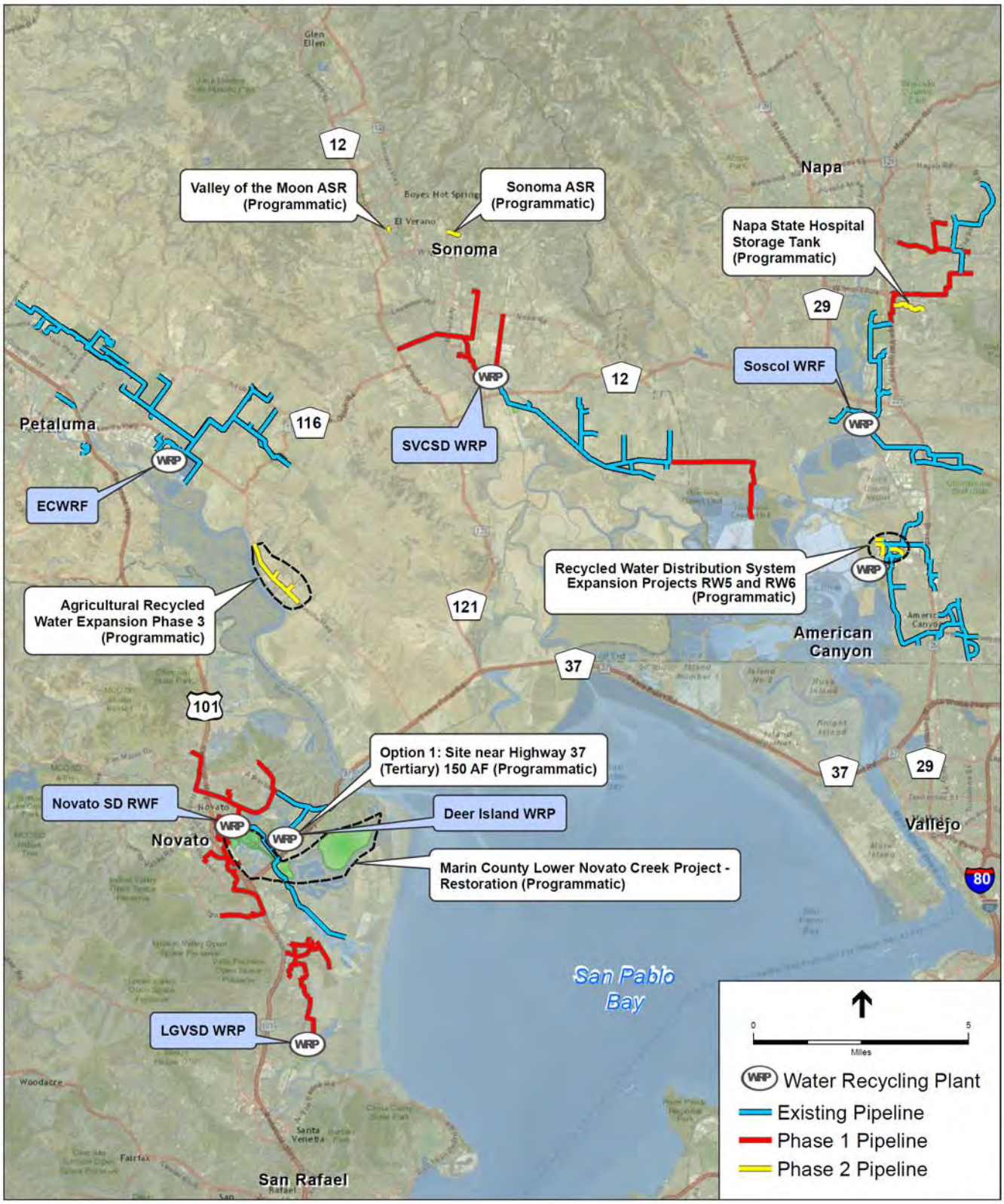


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-14

City of American Canyon
Recycled Water Distribution System Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-15

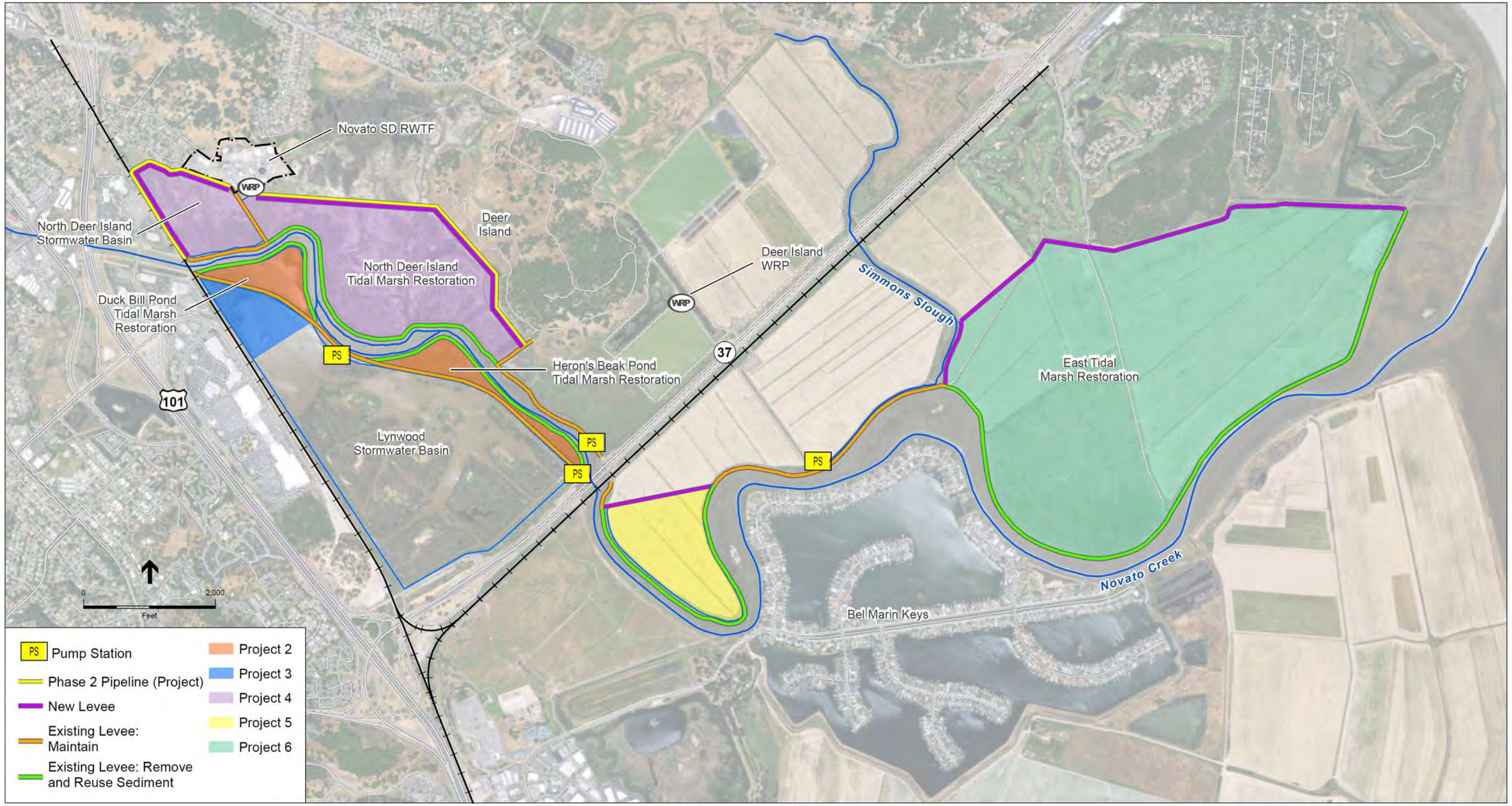
NBWRP Programmatic Level Projects

SOURCE: North Bay Water Reuse Program

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-16

Novato Sanitary District Option 1 -
Site Near Highway 37 (Tertiary) 150 AF



SOURCE: North Bay Water Reuse Authority

Figure 2-17

Marin County Lower Novato Creek Projects 2 - 6: Restoration

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-18

Napa Sanitation District

Napa State Hospital Storage Tank

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

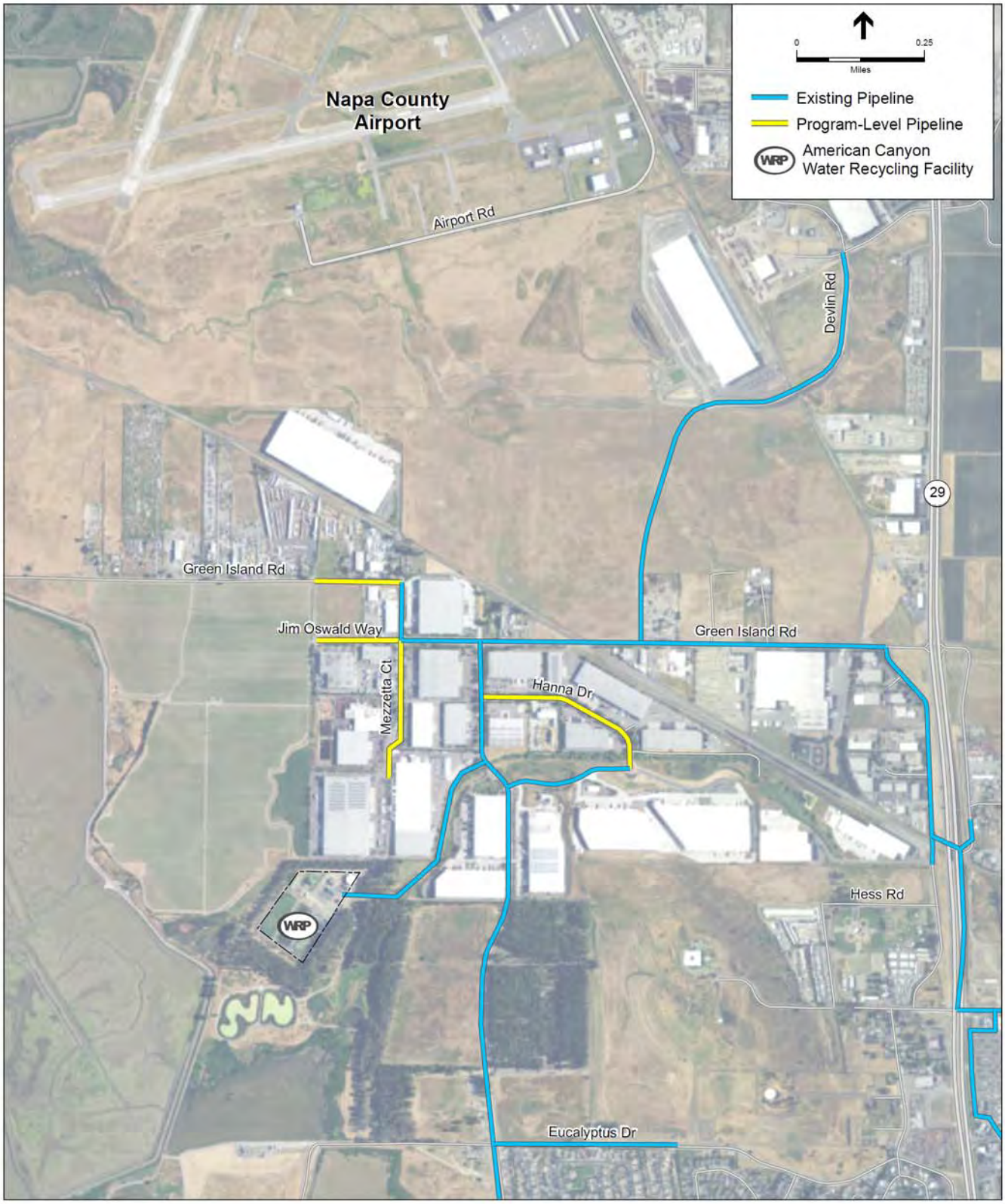
Figure 2-19
Valley of the Moon
Aquifer Storage and Recovery (ASR)

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-20

Sonoma Aquifer Storage and Recovery (ASR)



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-21

City of American Canyon

Recycled Water Distribution System Expansion Projects RW5 and RW6

City of Petaluma

ECWRF

Site Southeast of ECWRF (Secondary) 300 AF

Sonoma Valley County Sanitation District

SVCSD WRP

Mulas Site (Tertiary) 49 AF

Napa Sanitation District

MST Northern Loop

MST Eastern Extension

Soscol WRF

Jameson Ranch Site (Tertiary) 600AF

American Canyon WRF

Novato Sanitary District

Novato SD RWF

Novato SD WRP 2nd Expansion

Deer Island WRP

Site near Highway 37 (Secondary) 150 AF

LGVSD WRP

CMSA WRP

San Pablo Bay

0 5 Miles

Water Recycling Plant

Phase 2 Pipeline

Phase 1 Pipeline

Existing Pipeline

Seasonal Storage Pond

Seasonal Storage Site

SOURCE: North Bay Water Reuse Authority

1) Facilities identified would be implemented in addition to Proposed Action to provide 6,738 AFY of recycled water.

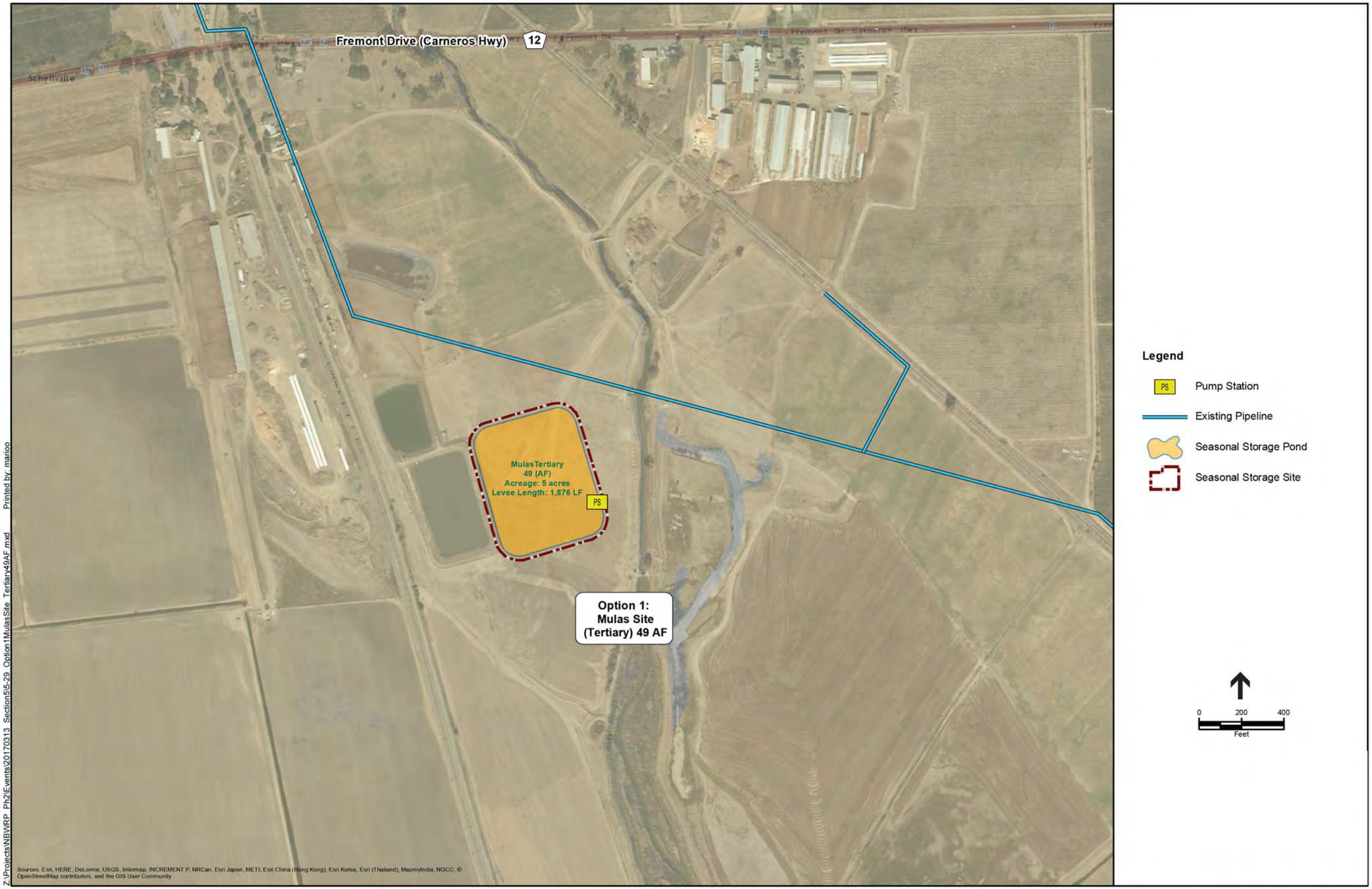
Figure 2-22
Storage Alternative

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-23

Novato San Storage – 150 AF (Secondary)

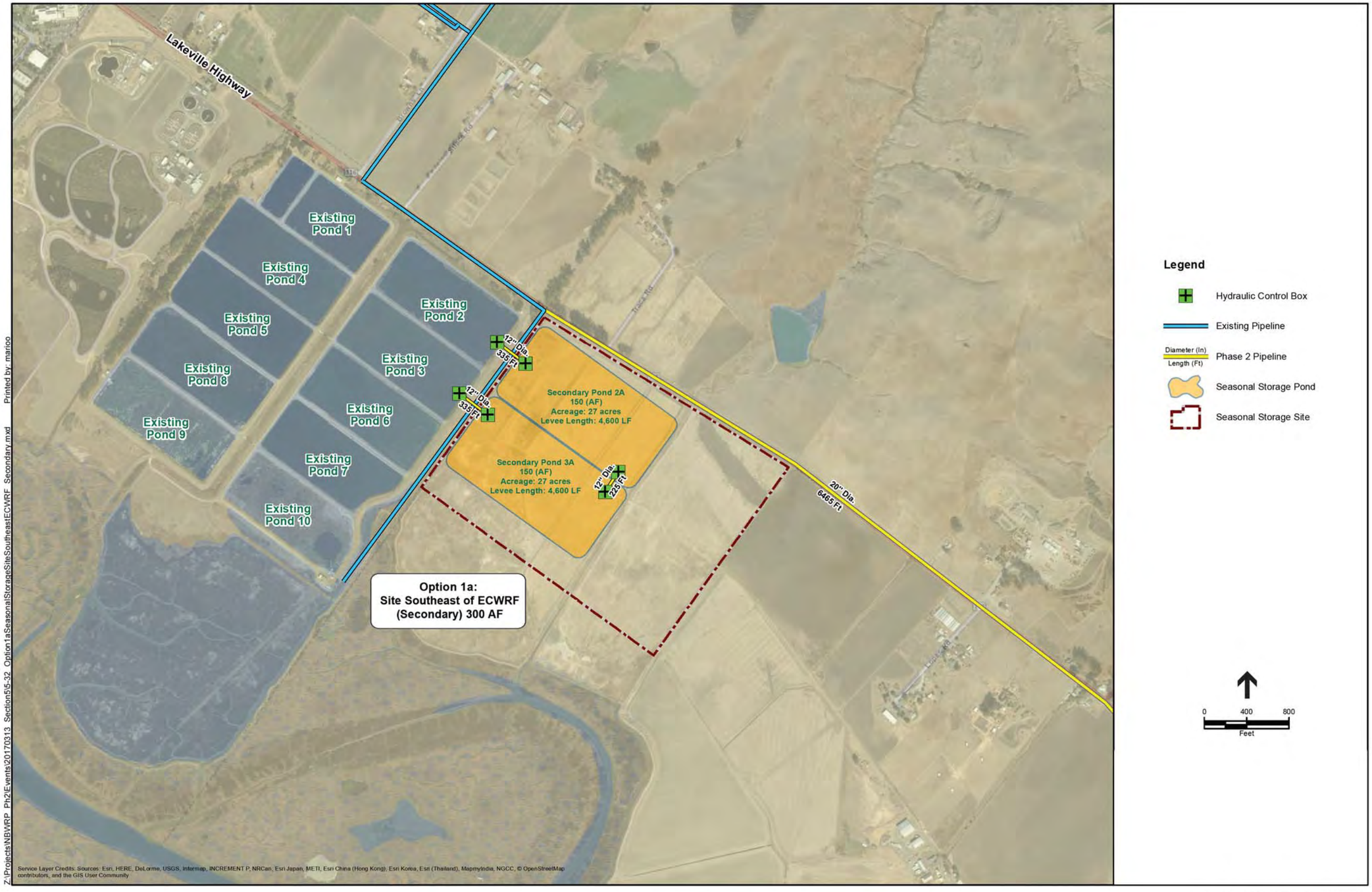


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-24

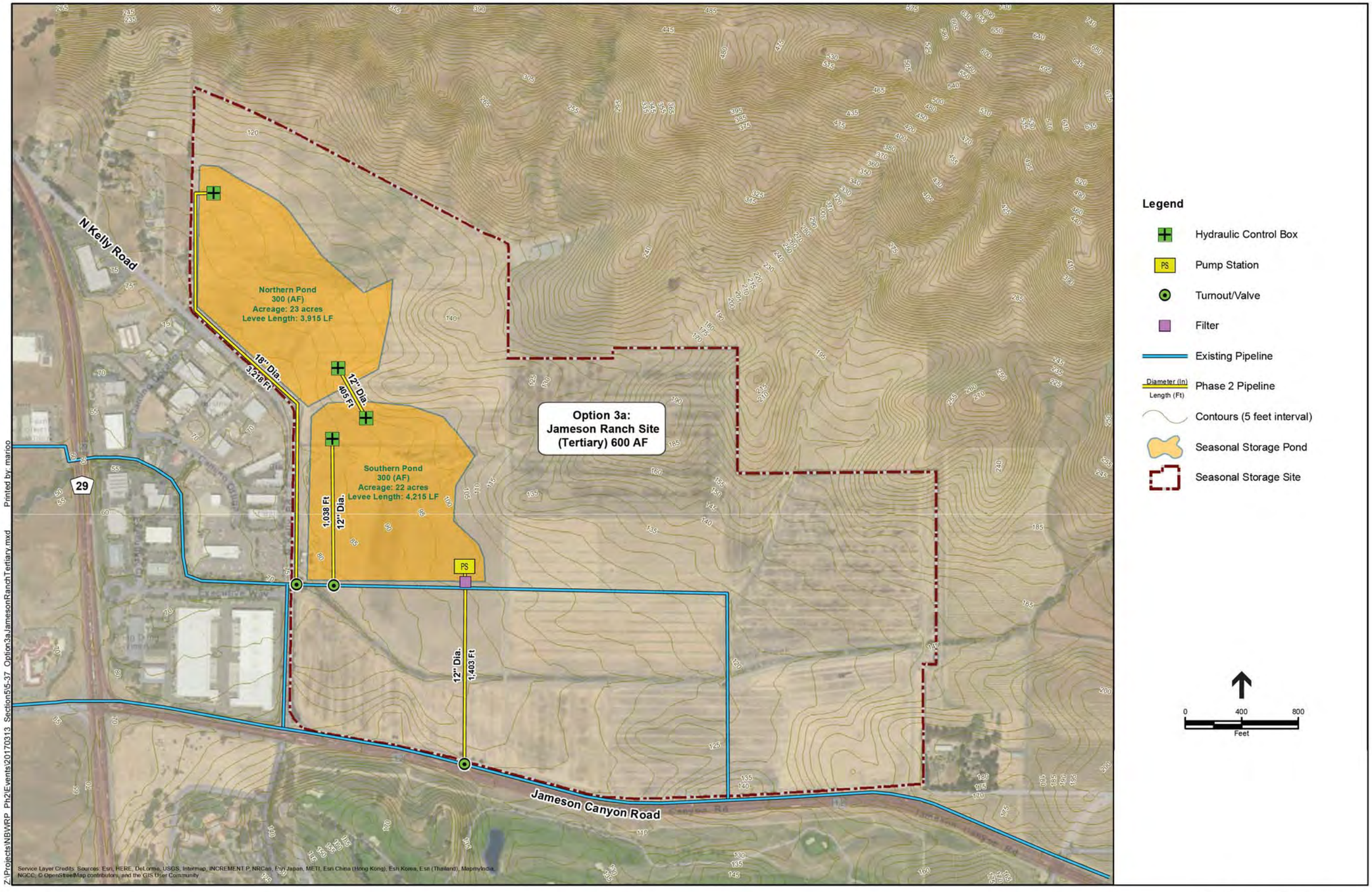
SVCSD Mulas Storage – 49 AF (Tertiary)



SOURCE: North Bay Water Reuse Authority

Figure 2-25

City of Petaluma Storage – 300 AF (Secondary)

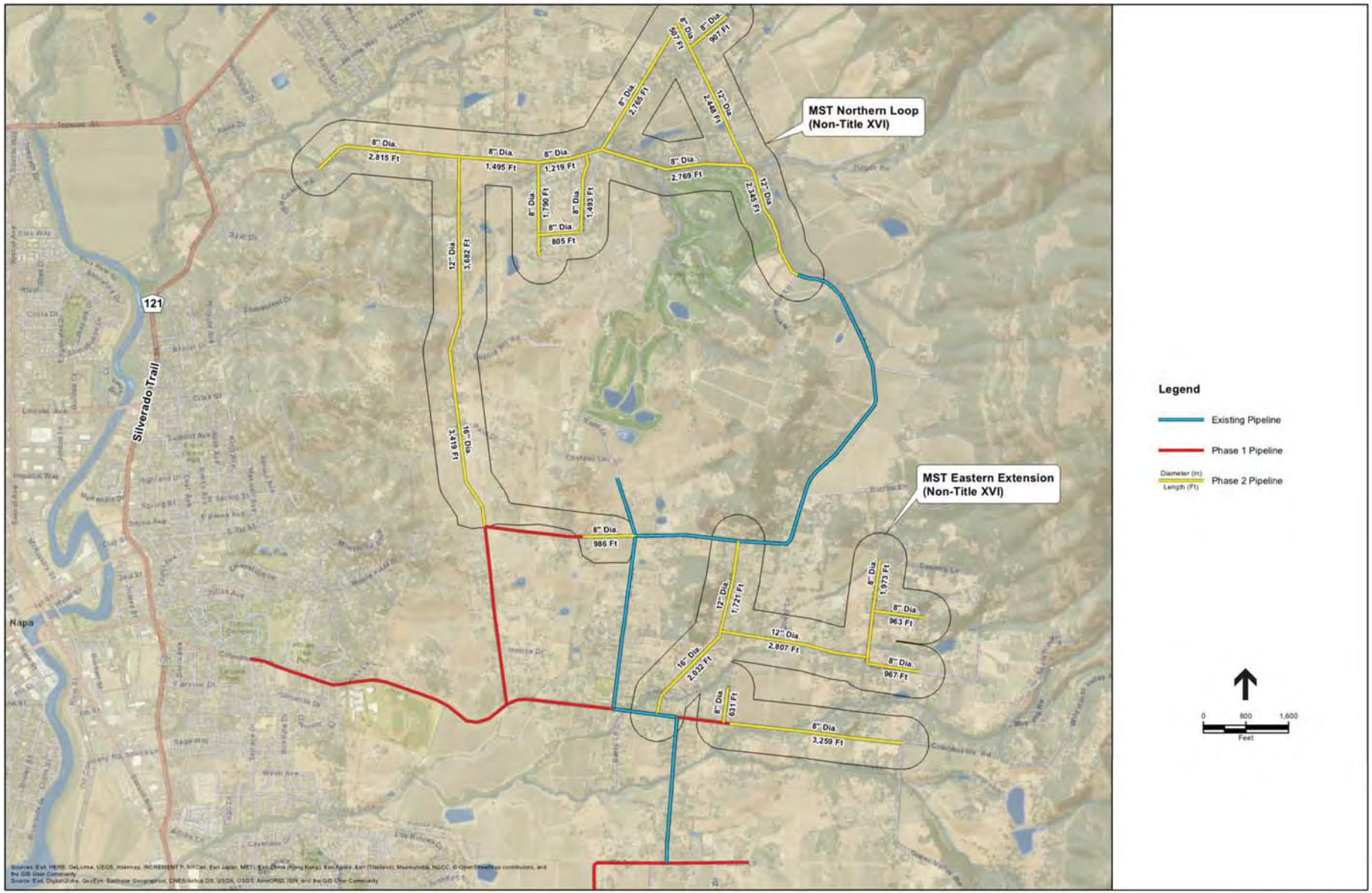


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-26

Napa SD Storage – 600 AF (Tertiary)

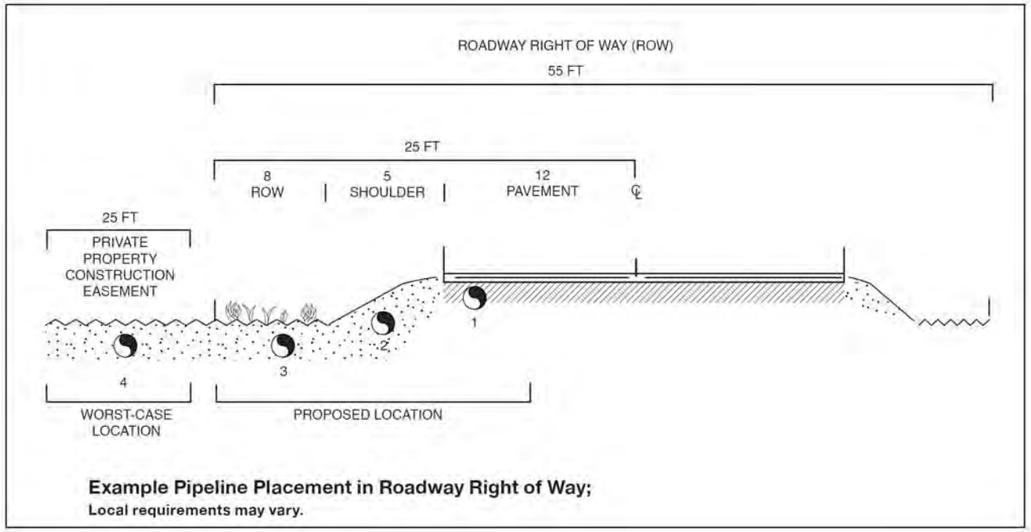


SOURCE: Brown and Caldwell

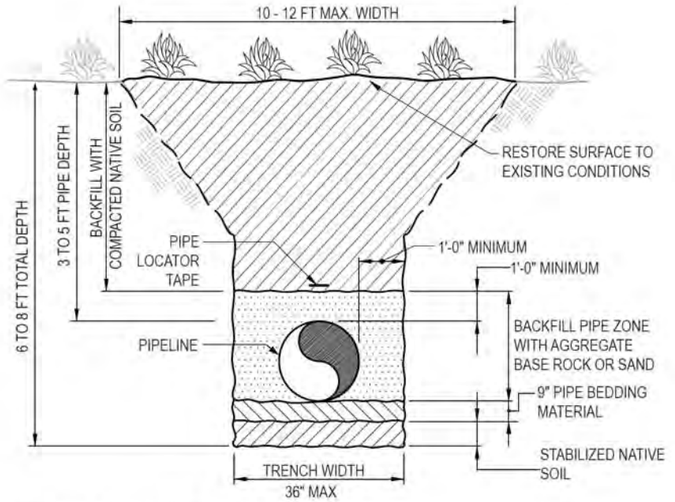
North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-27

MST Northern Loop and Eastern Extension

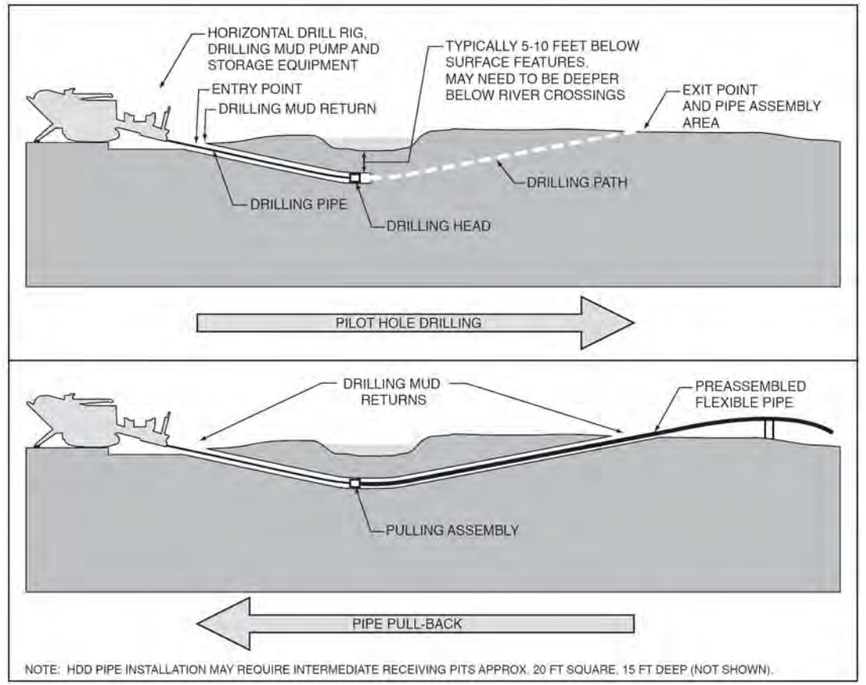


Example Pipeline Placement in Roadway Right of Way;
Local requirements may vary.

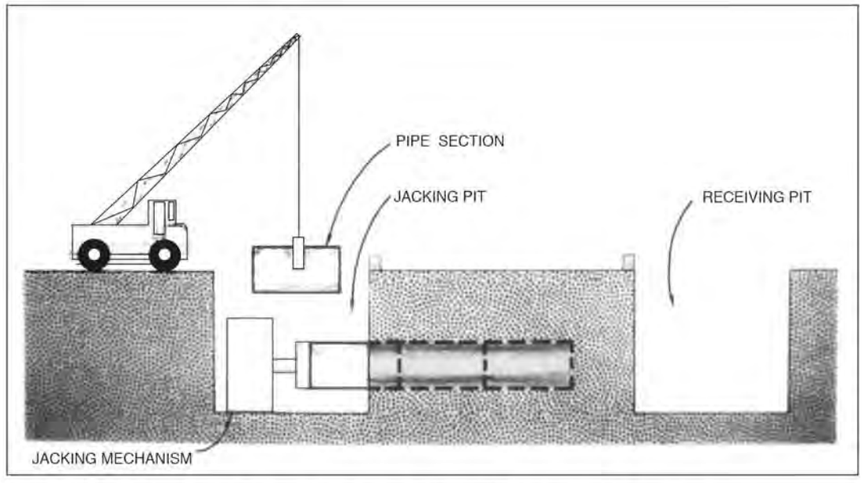


Example Open-cut Trench Section;
Local requirements may vary.

NOTE
DEWATERING AND TRENCH SHORING NOT SHOWN



Typical Horizontal Directional Drill Operation



Typical Bore And Jack Pipeline Installation Special Construction Locations

SOURCE: RMC Inc.; Brown and Caldwell; Nolte

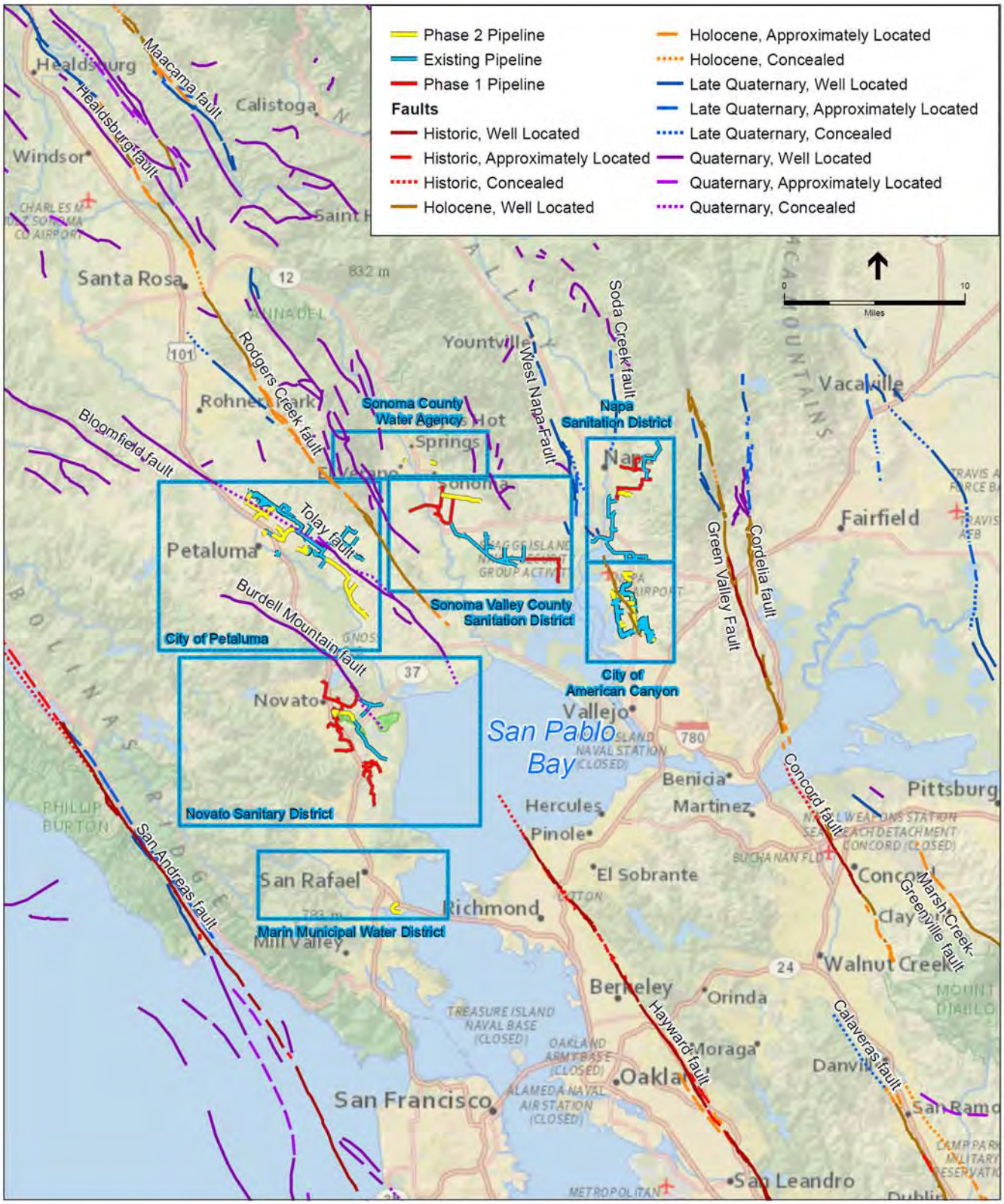
Agency	Project Type	Project Title	Year					
			2018	2019	2020	2021	2022	2023
Novato SD	Treatment	RWTF Capacity Expansion -						■
	Environmental Enhancement	Marin County Lower Novato Creek Project - Project 1					■	
		Turnout to Transitional Wetlands				■		
SVCSD	Distribution	Napa Road Pipeline				■		
City of Petaluma	Treatment	Increase Ellis Creek WRF Capacity		■				
	Distribution	Urban Recycled Water Expansion				■	■	■
		Agricultural Recycled Water Expansion 1			■			
		Agricultural Recycled Water Expansion 2				■		
Napa SD	Treatment	Soscol WRF Filter Capacity			■			
	Operational Storage	Soscol WRF Covered Storage			■			
MMWD/ CMSA	Distribution	Recycled Water Distribution System San Quentin Prison			■	■		
City of American Canyon	Distribution	Recycled Water Distribution System Expansion 1			■			
		Recycled Water Distribution System Expansion 2			■			
	Treatment	AmCam WRF Phase 2 Treatment Plant Upgrades				■	■	

SOURCE: Brown and Caldwell

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 2-29

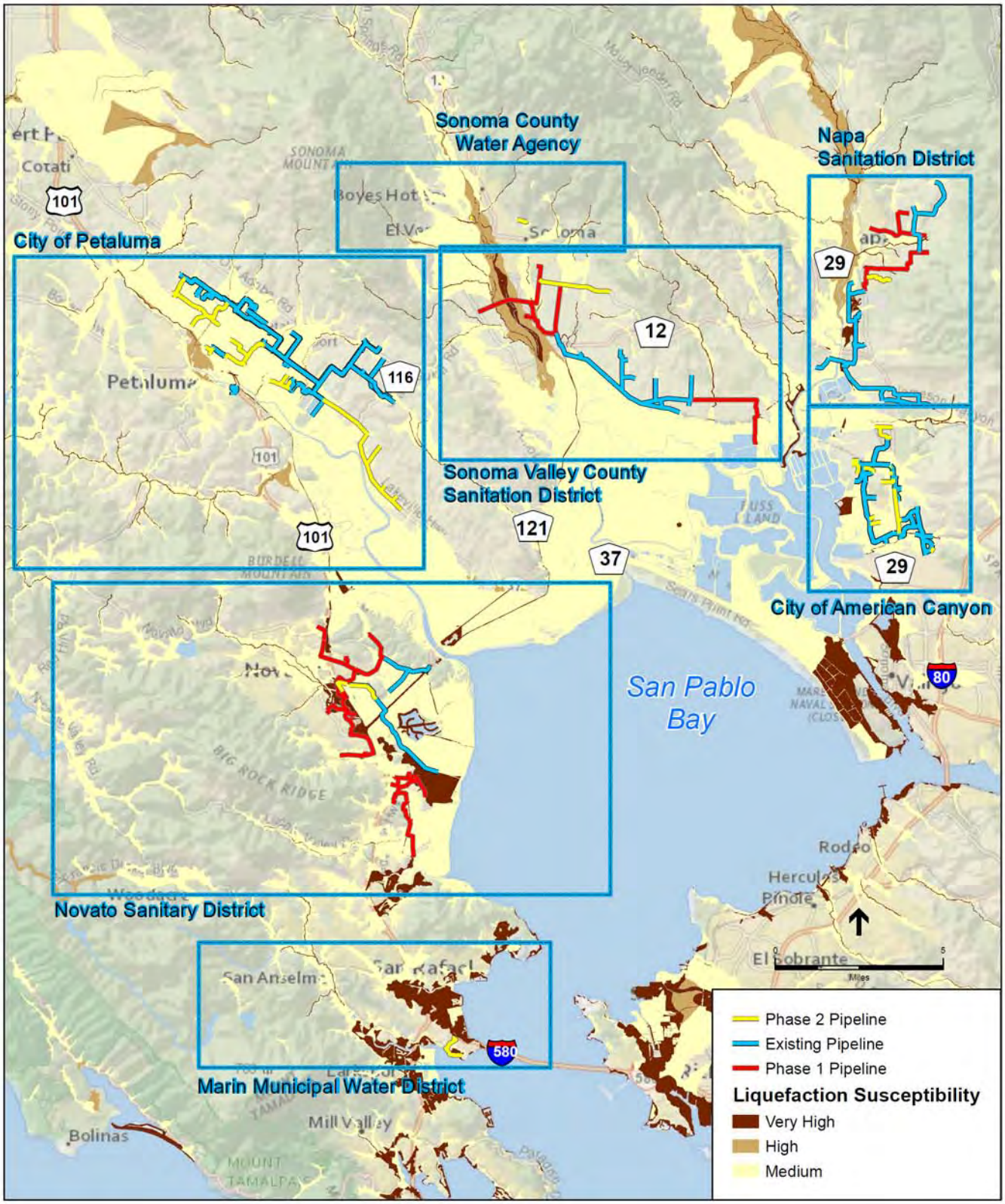
General Implementation Schedule



SOURCE: CGS, 2005

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

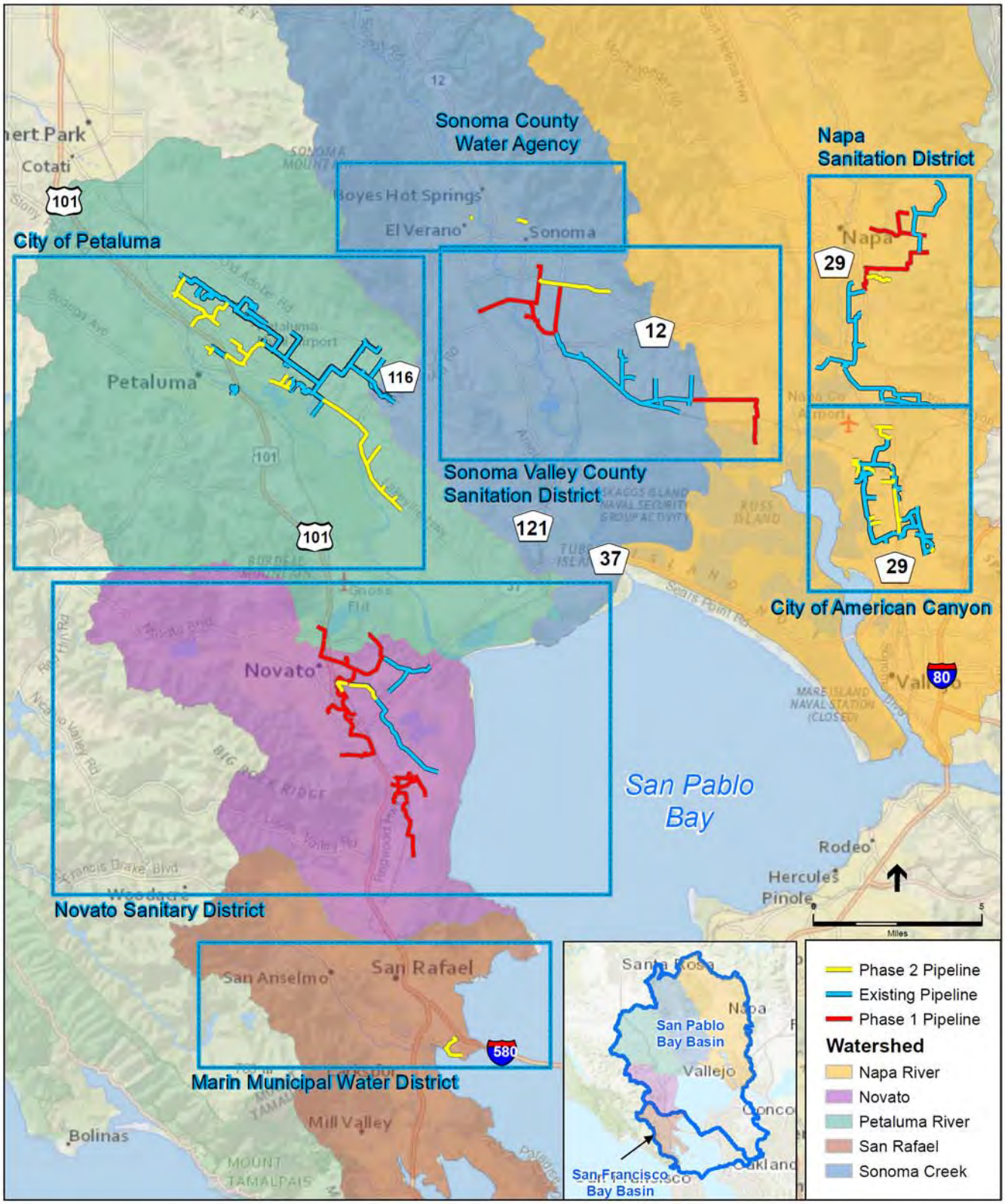
Figure 3.2-1
Regional Faults



SOURCE: USGS, 2006

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

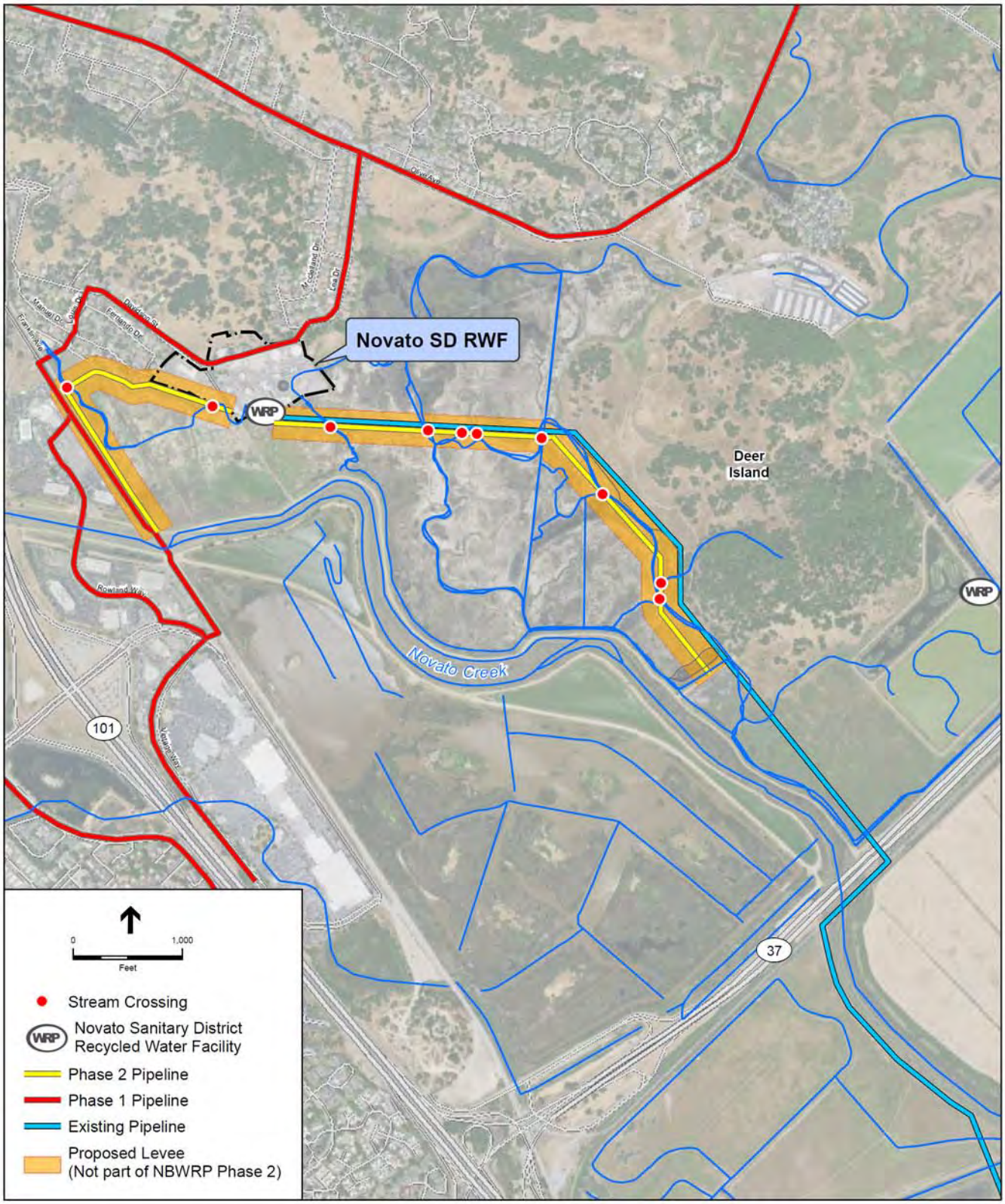
Figure 3.2-2
Liquefaction Susceptibility



SOURCE: DWR, 2004

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.3-1
Regional Watersheds

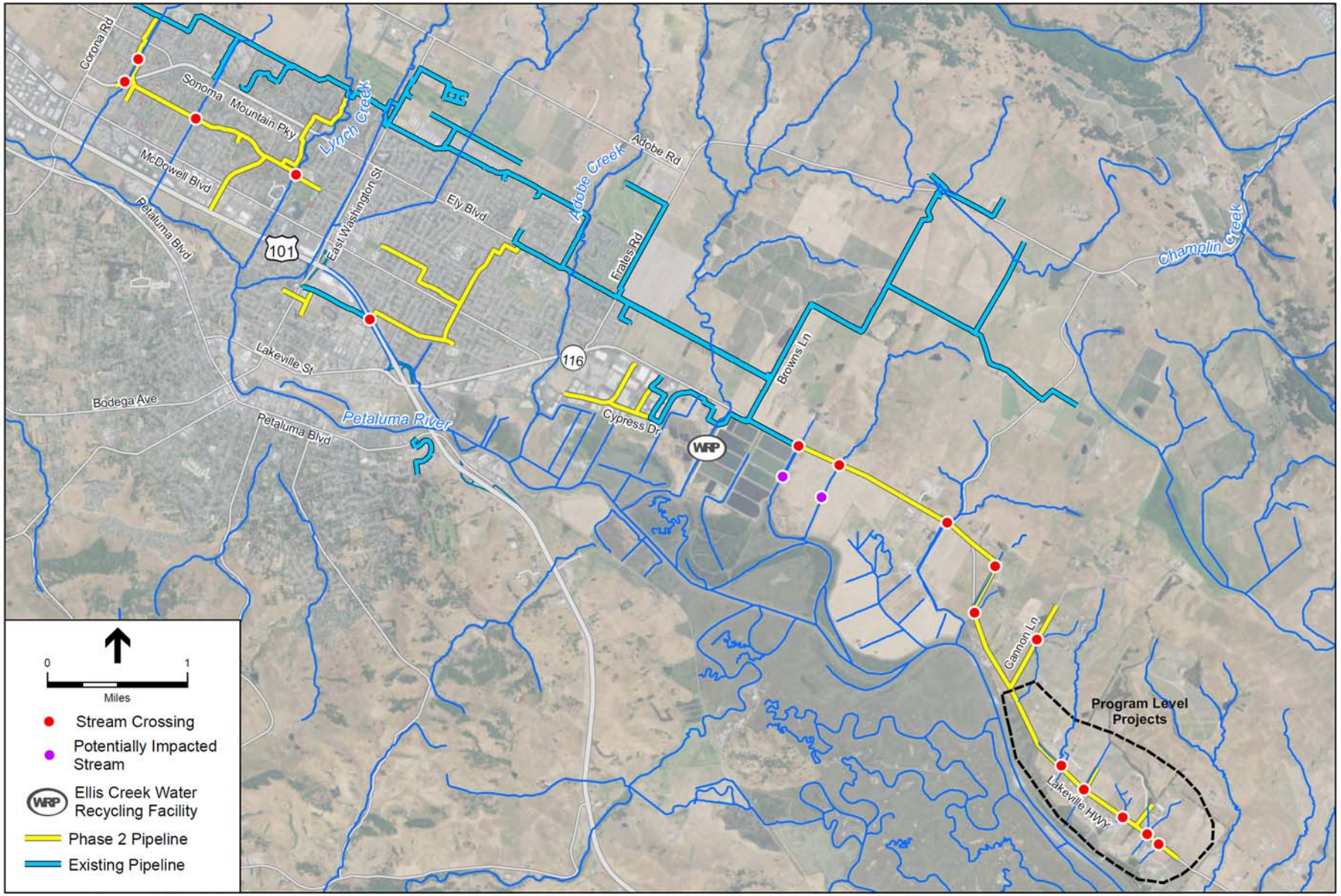


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.3-2

Stream Crossings by Facility- Novato

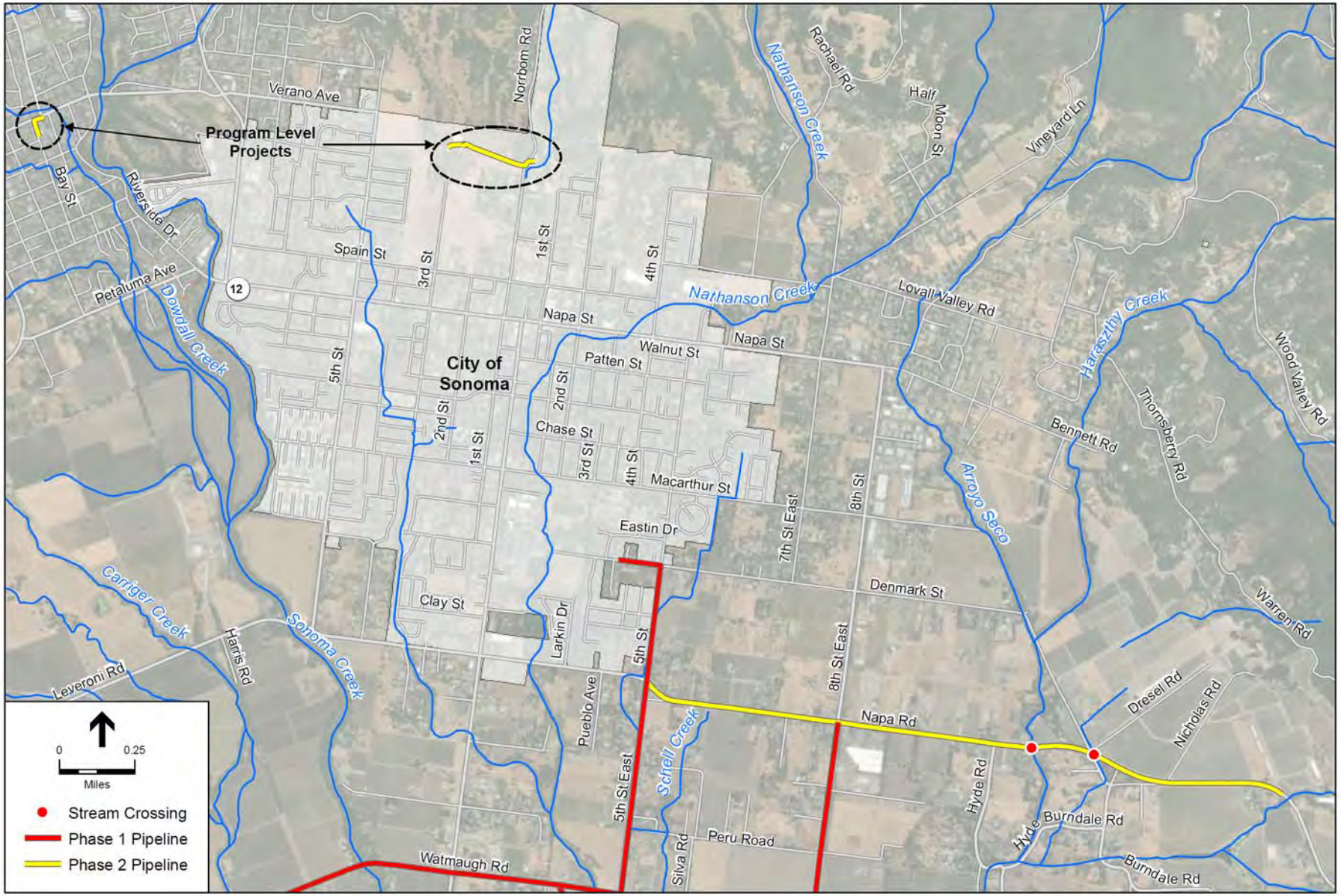


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.3-3

Stream Crossings by Facility - Petaluma

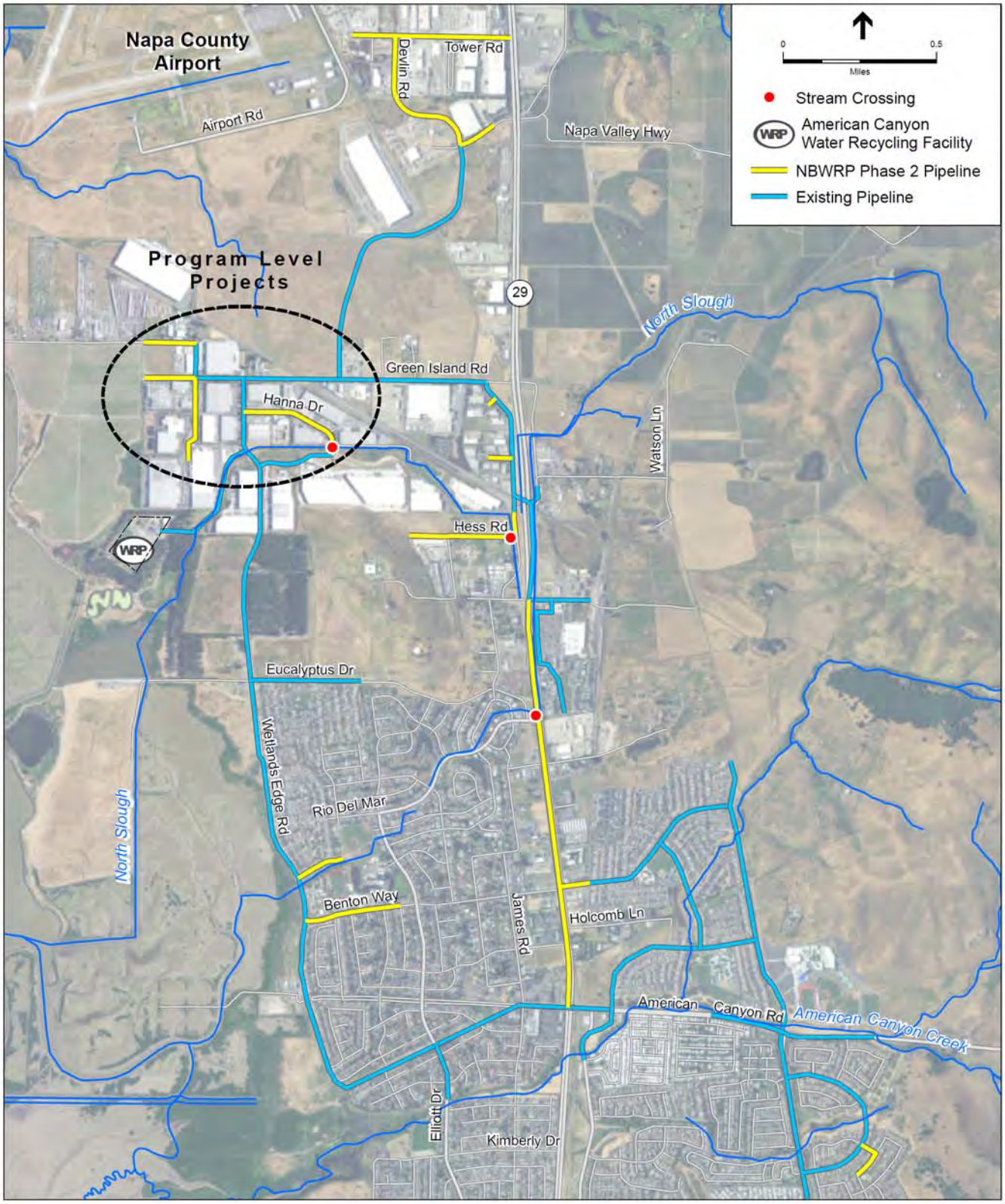


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.3-4

Stream Crossings by Facility - Sonoma

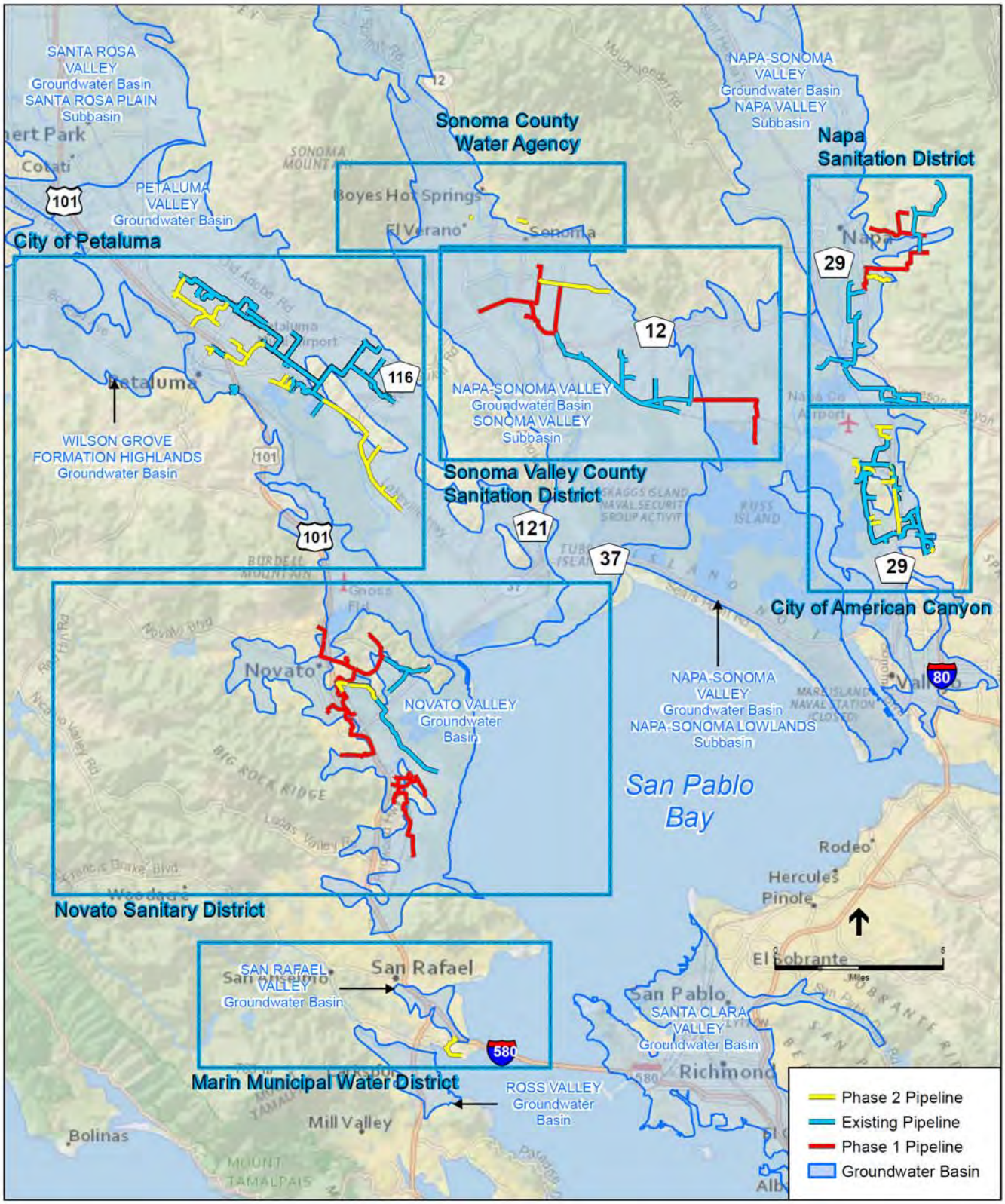


SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.3-5

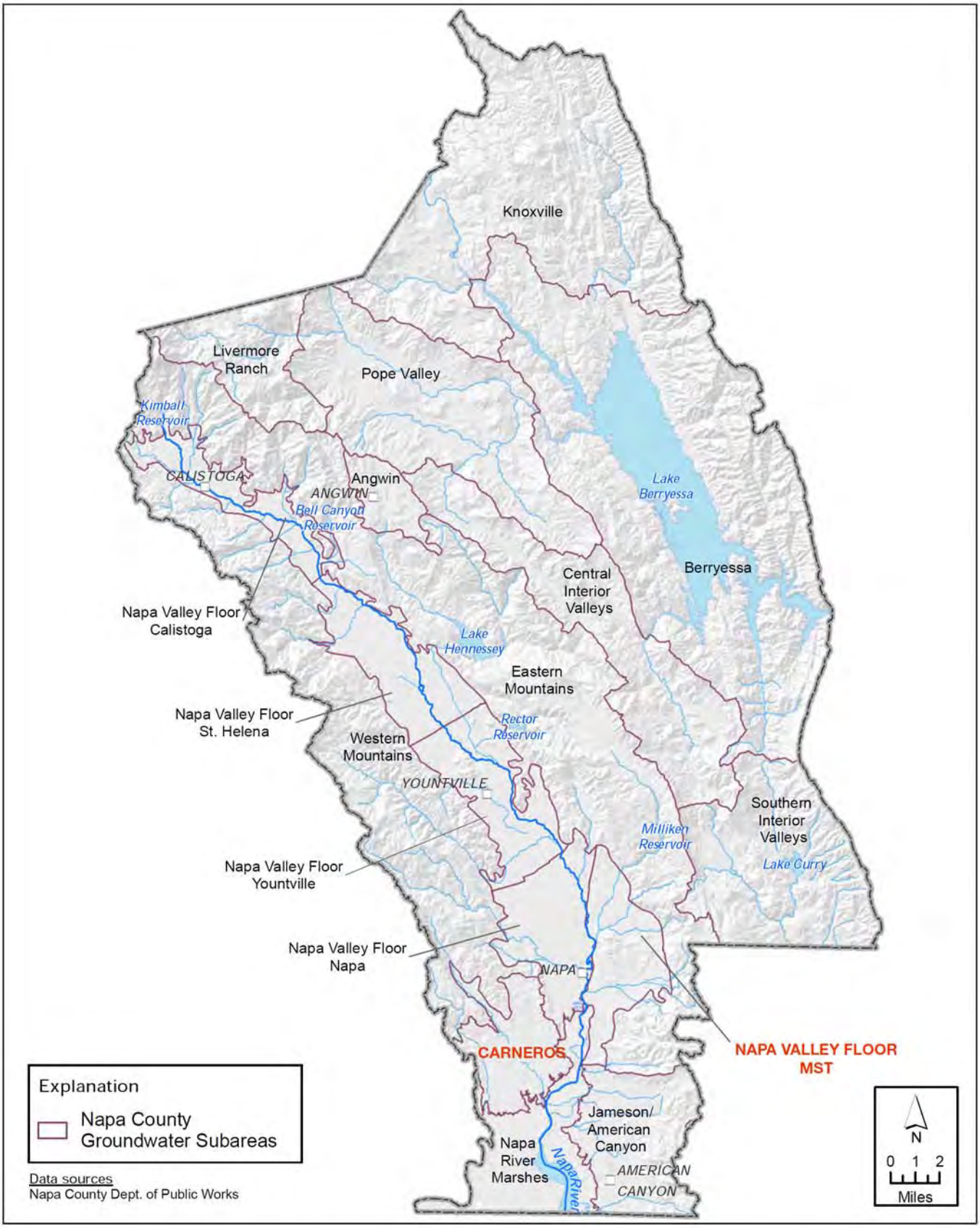
Stream Crossings by Facility - American Canyon



SOURCE: DWR, 2010

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.4-1
Regional Groundwater Basins

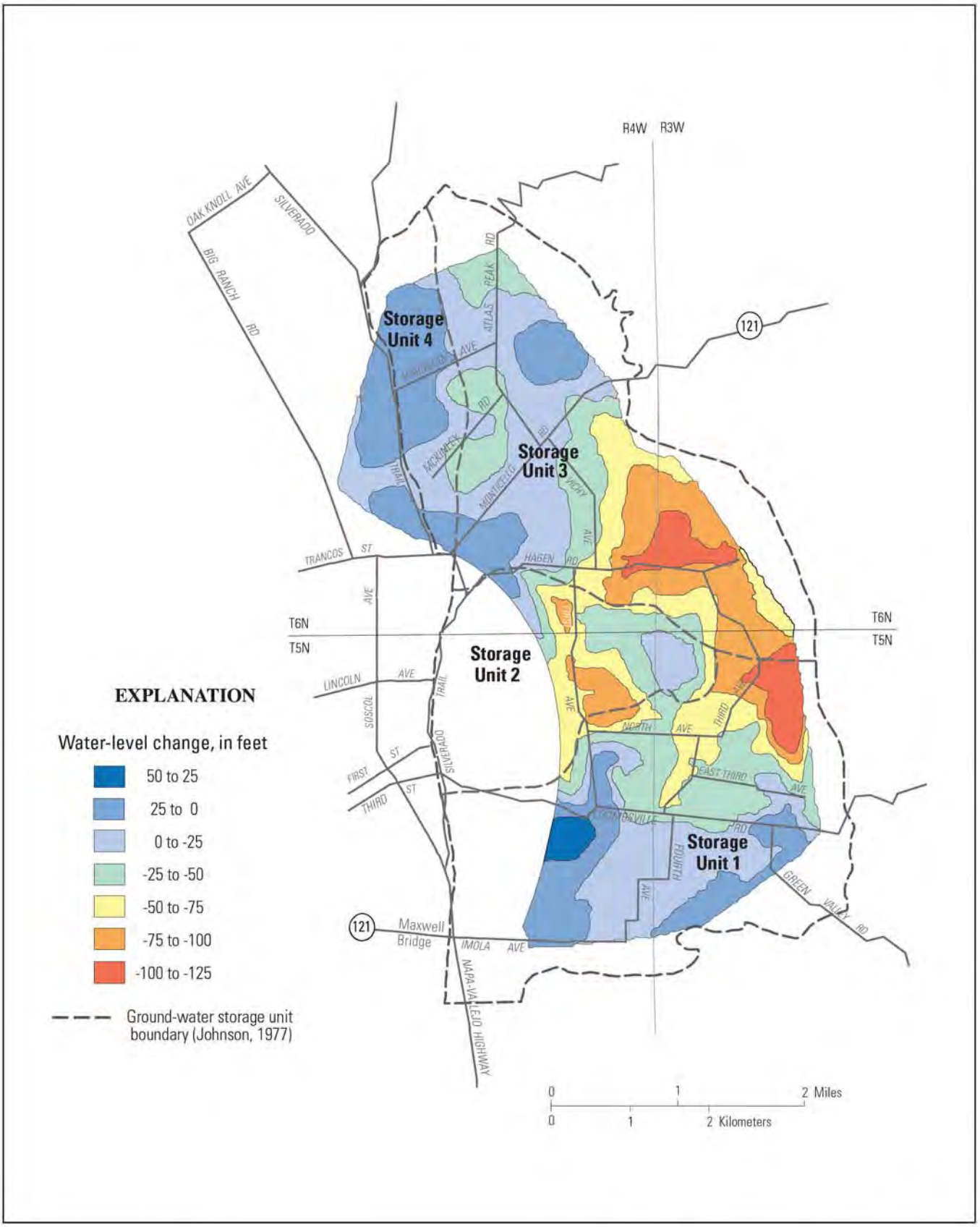


SOURCE: Luhdorff & Scalmanini Consulting Engineers, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.4-2

MST and Carneros Subbasins

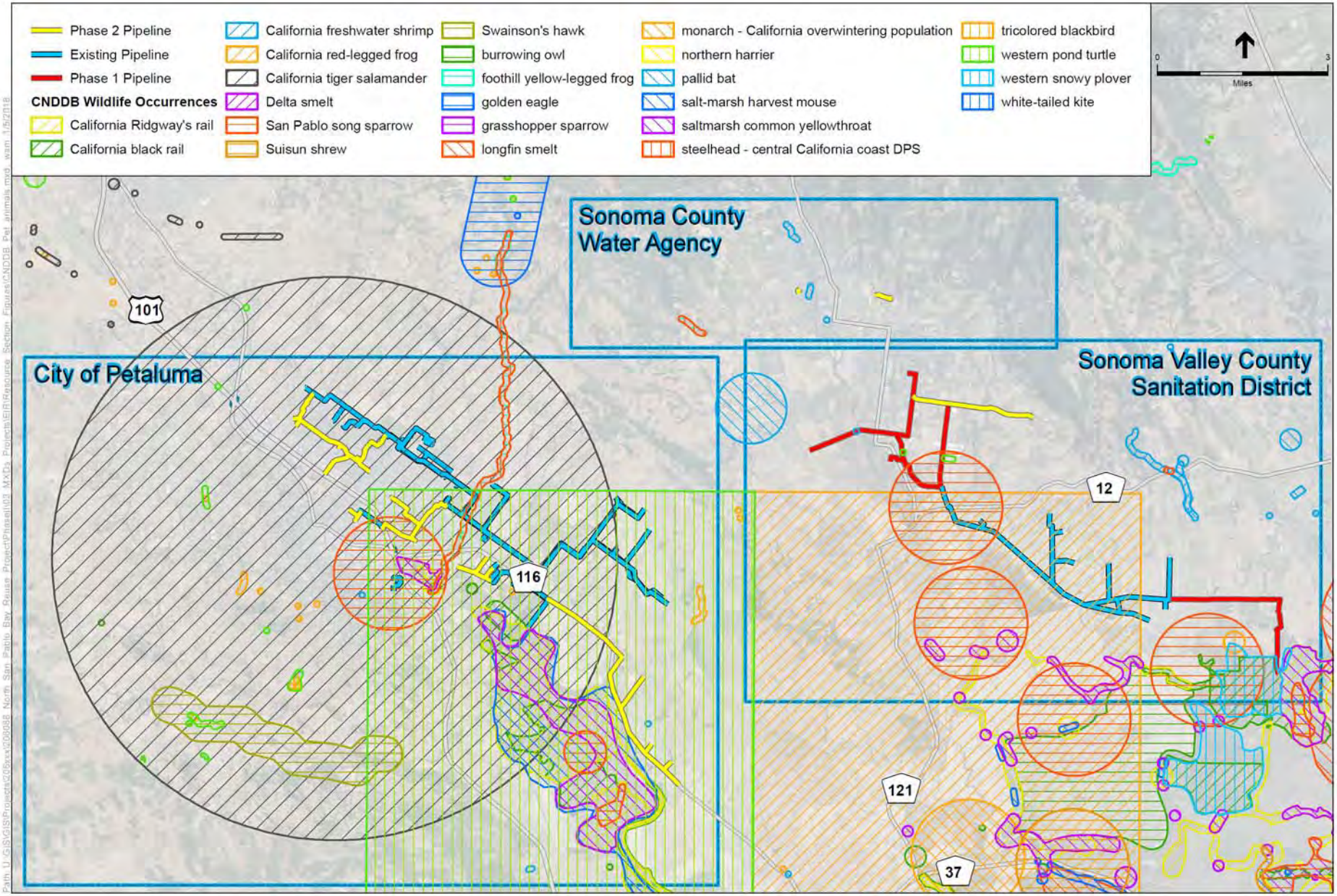


SOURCE: Farrar and Metzger, 2003

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.4-3

MST Area Pumping Depressions

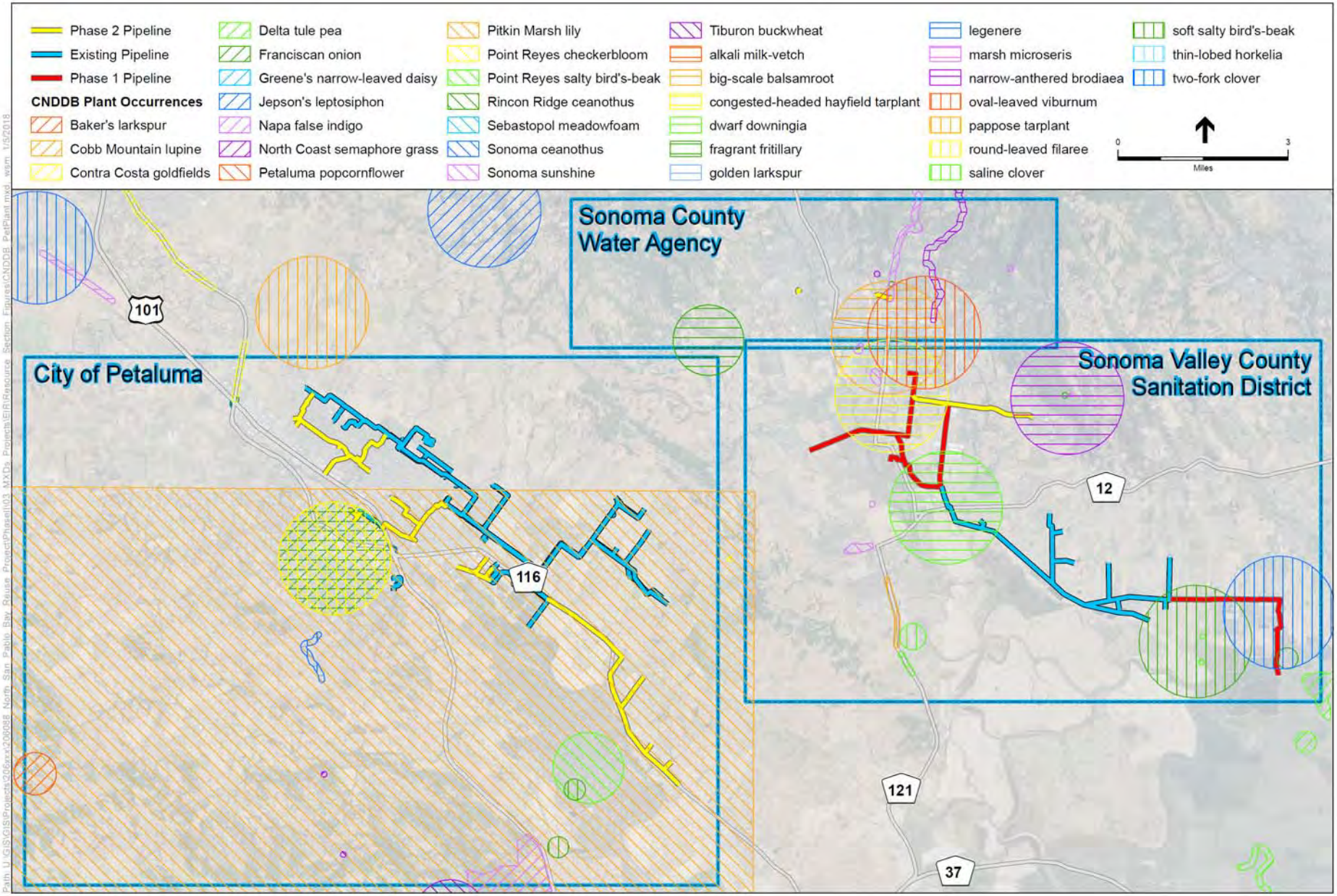


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-1

CNDDB Wildlife Occurrences in the Project Vicinity:
City of Petaluma, Sonoma Valley County Sanitation District, Sonoma County Water Agency

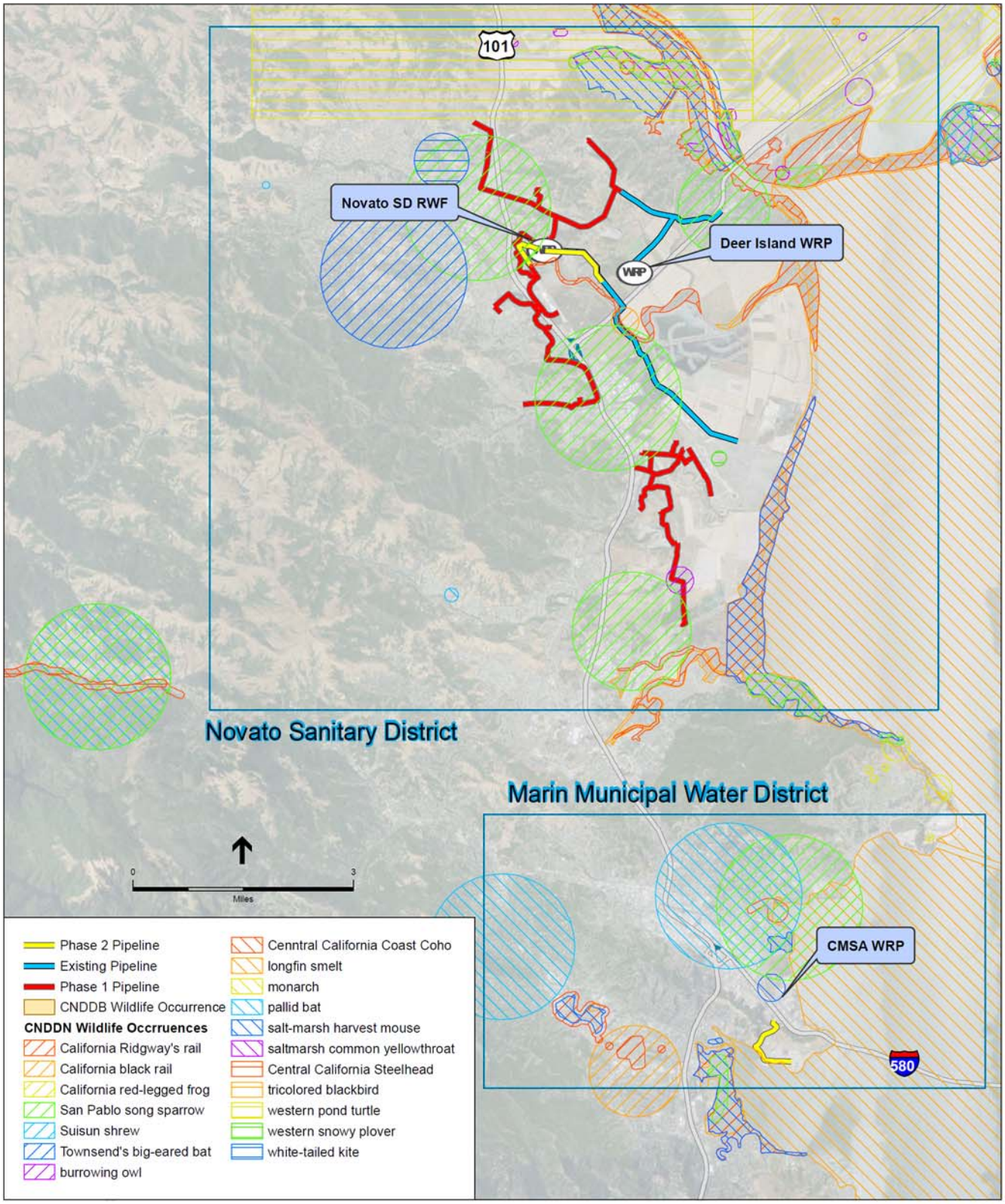


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-2

CNDDB Plant Occurrences in the Project Vicinity:
City of Petaluma, Sonoma Valley County Sanitation District, Sonoma County Water Agency

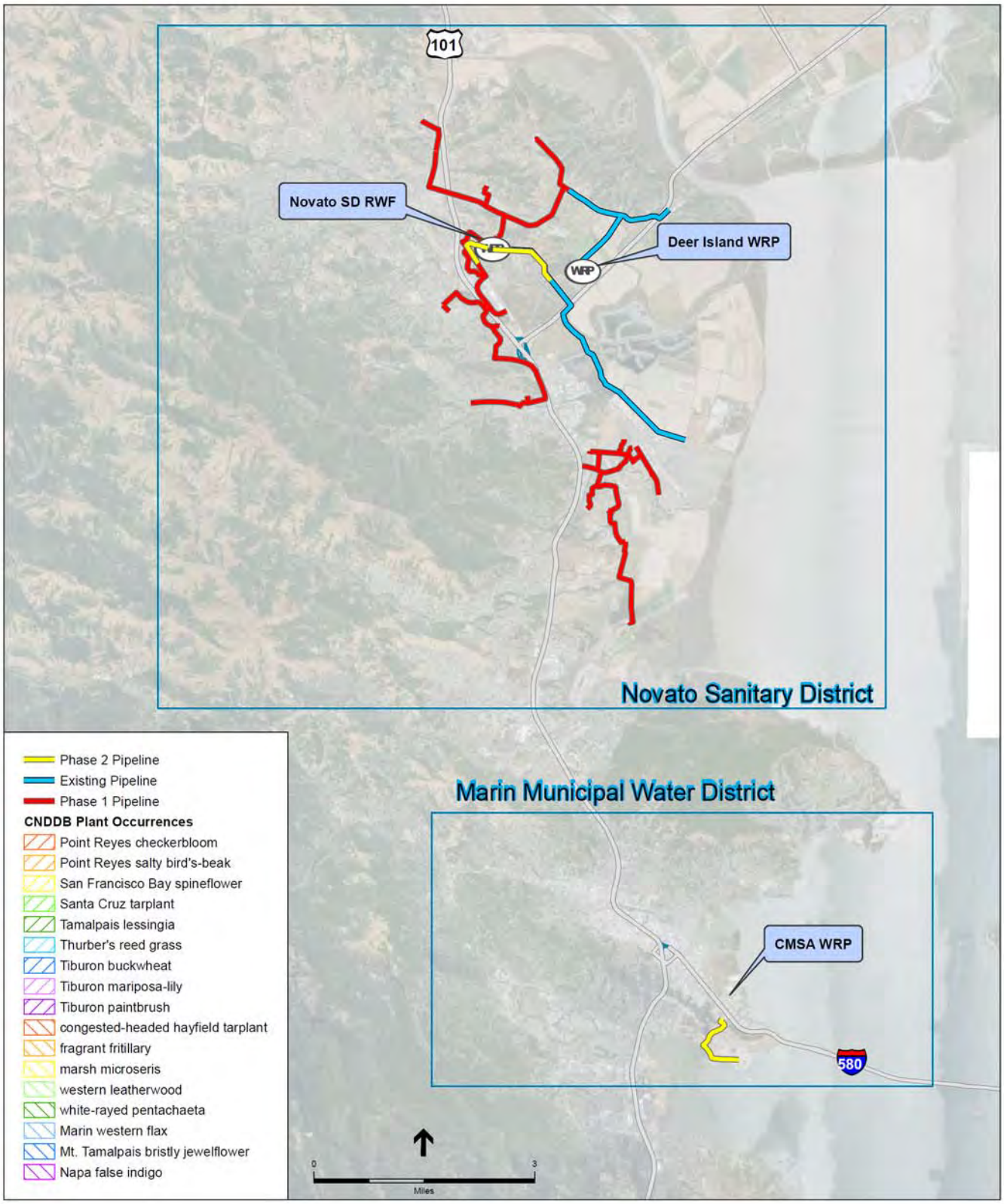


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-3

Wildlife Occurrences in the Project Vicinity:
Novato Sanitary District, Marin Municipal Water District

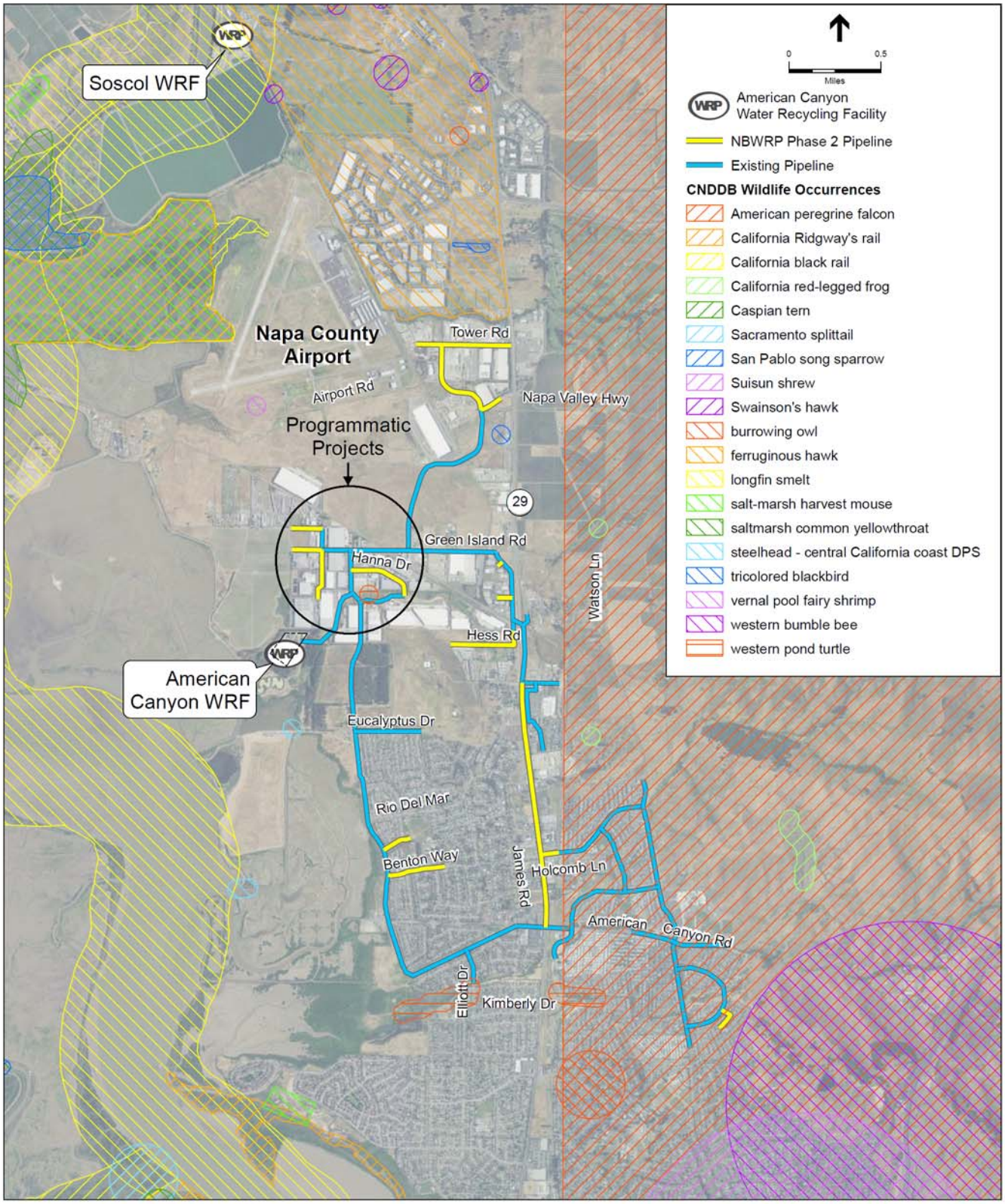


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-4

Plant Occurrences in the Project Vicinity:
Novato Sanitary District, Marin Municipal Water District

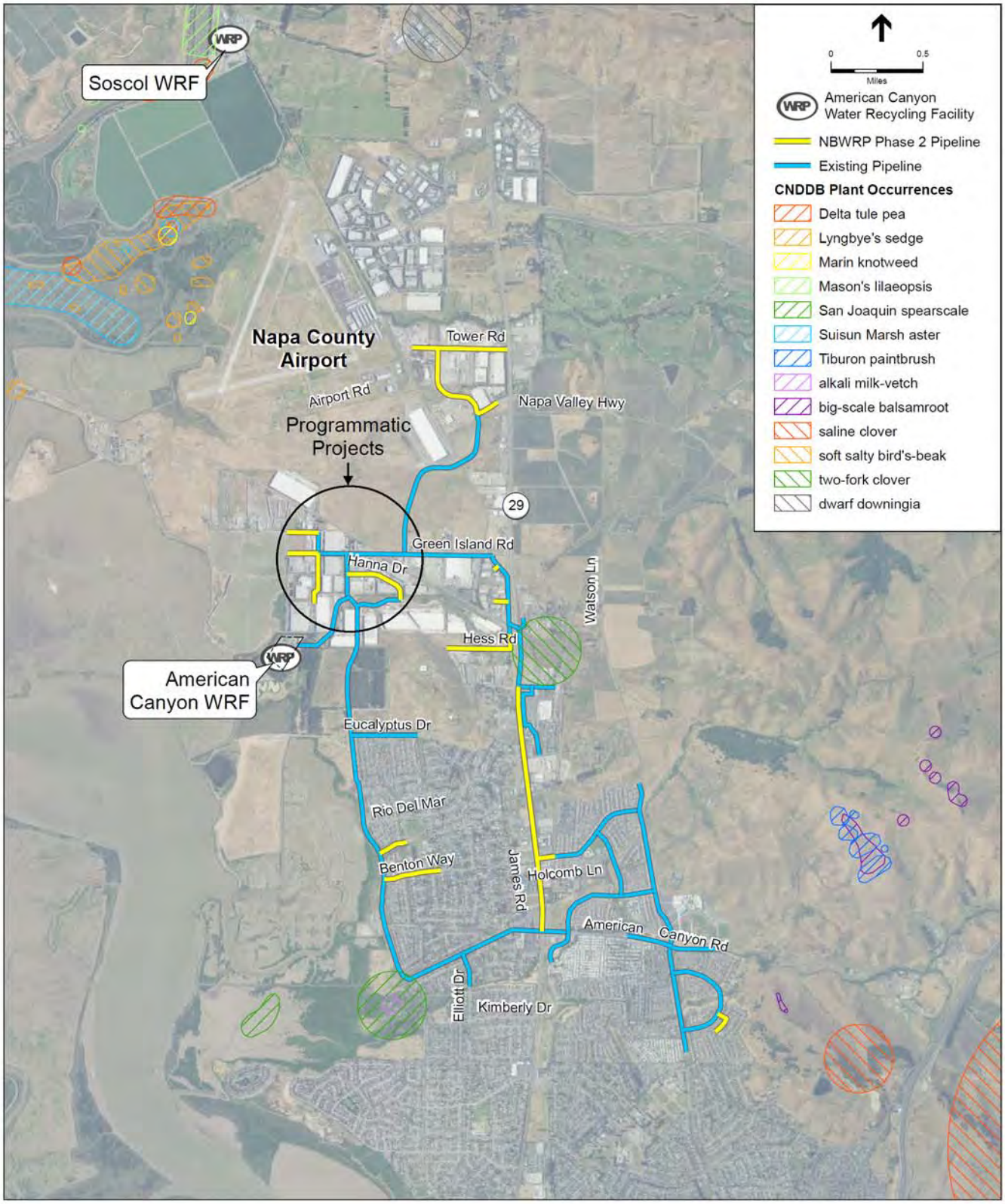


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-5

CNDDB Wildlife Occurrences in the Project Vicinity: Napa Sanitation District, City of American Canyon

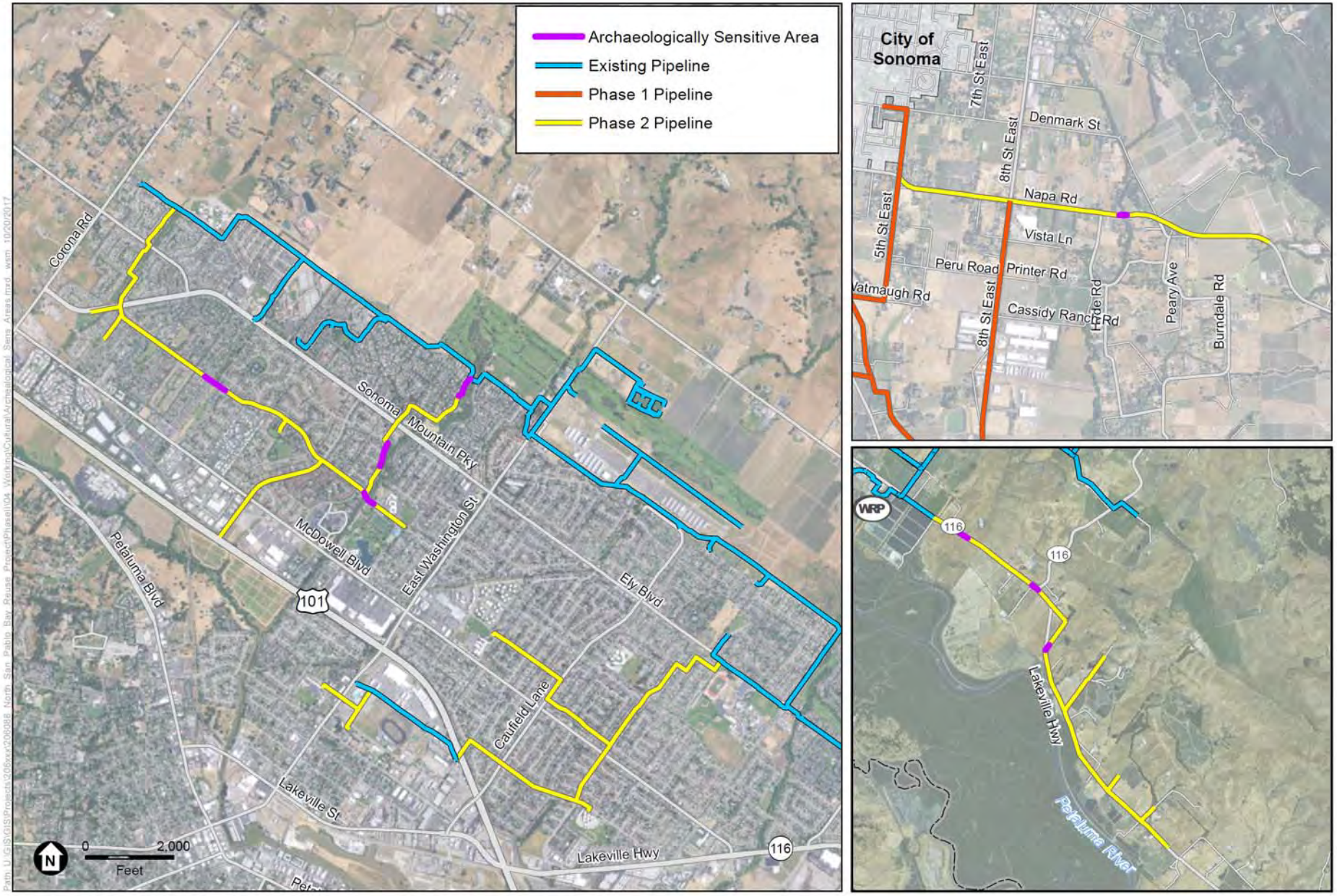


SOURCE: CDFW, 2017

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.6-6

CNDDB Plant Occurrences in the Project Vicinity: Napa Sanitation District, City of American Canyon



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088

Figure 3.14-1
Archaeologically Sensitive Areas

ESA

Appendix B
Acronyms and Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACWRF	American Canyon Water Reclamation Facility
ADFW	average dry weather flow
ADI	Area of Direct Impact
ADT	average daily traffic
AF	acre-feet
AFY	acre-feet per year
afa	acre-feet per annum
amsl	above mean sea level
APE	Areas of Potential Effect
AR	Agricultural Resources
ART	Adapting to Rising Tides
ASA	Area of Sensitivity Assessment
ASBS	area of special biological significance
ASCE	American Society of Civil Engineers
ASR	Aquifer Storage and Recovery
ASTs	aboveground storage tanks
Authority	North Bay Water Reuse Authority
BA	Biological Assessment
BAAQMD	San Francisco Bay Area Air Quality Management District
BACT	Best Available Control Technology
BCDC	Bay Conservation and Development Commission
BEA	Bureau of Economic Analysis
BEPA	Bald Eagle Protection Act
bgs	below ground surface
BMOs	Basin Management Objectives
BMK	Hamilton Bel Marin Keys
BMKV	Bel Marin Keys Unit-V
BMPs	Best Management Practices
BOD	biochemical oxygen demand
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CA BOND EXP	California Bond Expenditure Plan
CA FID	Facility Inventory Database
CA WDS	Waste Discharge System
CalEEMod	California Emissions Estimator Model
Cal EPA	California Environmental Protection Agency
CalARP	California Accidental Release Prevention Program
CalEMA	California Emergency Management Agency
CalTrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board

CBC	California Building Code
CCR	California Code of Regulations
CD	Community Development
CDE	Community Development Element
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDMG	California Division of Mines and Geology
CEC	chemicals of emerging concern
CEQ	Council of Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response , Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGP	Construction General Permit
CGS	California Geological Survey
CH_4	Methane
CHMIRS	California Hazardous Material Incident Report System
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CIP	Capital Improvements Program
CMP	Congestion Management Program
CMPA	Central Marin Police Authority
CMSA	Central Marin Sanitation Agency
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	CO_2 equivalent
CRLF	California red-legged frog
CSC	California Species of Special Concern
CTS	California tiger salamander
CTR	California Toxics Rule
CUPA	Certified Unified Program Agency
CUWCC	California Urban Water Conservation Council
CWA	Clean Water Act
CWC	California Water Code

cy	cubic yards
dB	decibel
dBA	A-weighted decibels
DEIR	Draft Environmental Impact Report
DFG	Department of Fish and Game
DGESL	Department of Geosciences Environmental Studies Laboratory
DHS	Department of Health Services
DO	dissolved oxygen
DOT	Department of Transportation
DPH	Department of Public Health
DPM	Diesel Particulate Matter
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EDD	Economic Development Department
EDR	Environmental Data Resources
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMI	Emissions Inventory Data
EMS	Emergency Medical Services
EO	Executive Order
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Science Associates
ESCP	Erosion and Sediment Control Plan
ESU	Evolutionary Significant Unit
FAA	Federal Aviation Administration
FCWCD	Flood Control and Water Conservation District
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FIGR	Federation of Indians of Graton Rancheria
FINDS	Facility Index System
FMMP	Farmland Mapping and Monitoring Program
FMP	Fisheries Management Plan
FPPA	Farmland Protection Policy Act
FPP	Farmland Protection Program
FRHZ	Fault Rupture Hazard Zone
FRPP	Farm and Ranchland Protection
ft	feet
FTA	Federal Transit Administration
FUDS	Formerly Used Defense Sites

g	gravity
GGBHTD	Golden Gate Transit and Marin Transit bus routes
GHG	Green House Gases
GP	General Plan
gpm	gallons per mile
GSA	Groundwater Sustainability Agencies
GSP	Groundwater Sustainability Plans
GULP	Groundwater Under Local Protection
HFC	hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
HMP	Hazard Mitigation Plan
hp	horsepower
HRA	health risk assessments
HSWA	Hazardous and Solid Waste Amendments
H:V	horizontal-to-vertical
HWCL	Hazardous Waste Control Law
Hz	hertz
I & I	Infiltration and Inflow
IBC	International Building Code
ICBO	International Conference of Building Officials
ICC	International Code Council
IPac	Information for Planning and Consultation
IPS	Influent pump station
IRWP	Incremental Recycled Water Program
ITAs	Indian Trust Assets
km	kilometers
kV	kilovolt
kwH	kilowatt hours
L_{dn}	day-night average noise level
L_{eq}	energy-equivalent noise level
L_{max}	maximum noise level
LESA	Land Evaluation and Site Assessment
lf	linear feet
LGVSD	Las Gallinas Valley Sanitary District
LID	Low Impact Development
LOS	Level of Service
LRA	local area responsibilities
LS	Less than Significant
LSM	Less than Significant with Mitigation
LU	Land Use
LUST	Leaking Underground Storage Tank
M	Richter magnitude

M&I	municipal and industrial
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MCFC&WCD	Marin County Flood Control & Water Conservation District
MCWRP	Marin County Water Recycling Projects Water Quality and Operations Committee
mg	milligrams
MG	million-gallon
mg/L	milligrams per liter
mgd	million gallons per day
MHHW	mean high water
MLLW	mean lower low water
MM	Modified Mercalli
MMI	Modified Mercalli Intensity
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
MPN	most probable number
MRZ	Mineral Resources Zone
msl	mean sea level
MS4	Municipal Separate Storm Sewer System
MST	Milliken-Sarco-Tulucay
MTBE	methyl tertiary butyl ether
MTC	Metropolitan Transportation Commission
MUTCD	California Manual on Uniform Traffic Control Devices
µS/cm	microsiemens per centimeter
Mw	Moment magnitude
MWh	megawatt hours
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
Napa SD	Napa Sanitation District
NBBR	Nesting Breeding Birds and Raptors
NBWA	North Bay Watershed Association
NBWRA	North Bay Water Reuse Authority
NBWRP	North Bay Water Recycling Program
NCTPA	Napa County Transportation Authority
NEPA	National Environmental Protection Act
NFPD	Novato Fire Protection District
NHPA	National Historic Preservation Act
NI	No Impact
NMWD	North Marin Water District
NMFS	National Marine Fisheries Service

NO_2	Nitrogen Dioxide
NO_x	Nitrogen oxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
Novato SD	Novato Sanitation District
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NPPA	Native Plant Protection Act
NRCS	National Resource Conservation Service
NUSD	Novato Unified School District
NVUSD	Napa Valley Unifies School District
NWIC	Northwest Information of the California Historical Resources Information System
NWPRA	Northwestern Pacific Railroad Authority
O_3	Ozone
OAG	Office of the California Attorney General
O & M	Operations and Maintenance
OEHHA	Office of Environmental Health Hazard Assessment
OES	California Office of Emergency Services
OHW	ordinary high water
OMB	Office of Management and Budget
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
OSRC	Open Space and Resource Conservation Element
PBO	Programmatic Biological Opinion
PFCs	perfluorocarbons
PG&E	Pacific Gas & Electric Company
PGA	peak ground acceleration
PM 10	particulate matter $\leq$ 10 microns
PM 2.5	particulate matter $\leq$ 2.5 microns
PM	particulate matter
POD	Pelagic Organism Decline
PPCP	Pharmaceutical and Personal Care Products
ppm	parts per million
PPV	peak particle velocity
PRDs	permit registration documents
PSD	Prevention of Significant Deterioration
PVP	Potter Valley Project
RCD	Resource Conservation District
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RFO	request for offers
RH Plan	Regional Haze Plan

RMS	root mean square
ROD	Record of Decision
ROG	Reactive organic gases
RWTF	Recycled Water Treatment Facility
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCTA	Sonoma County Transportation Authority
SCWA	Sonoma County Water District
SD	Sanitation District
SDC	Seismic Design Category
SF_6	Sulfur Hexafluoride
SFD	Sir Francis Drake
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Plan
SLIC	Spills, Leaks, Investigation, and Cleanup
SMARA	Surface Mining and Reclamation Act
SMART	Sonoma-Marin Area Rapid Transit
SMMP	Stream Management Master Plan
SO_2	Sulfur Dioxide
SOI	Sphere of Influence
SPCCs	Spill Prevention Control and Countermeasure Plans
SRA	state area responsibilities
SR	State Route
SSC	Species of Special Concern
SSCRCD	Southern Sonoma County Resource Conservation District
SVCSD	Sonoma Valley County Sanitation District
SVFRA	Sonoma Valley Fire and Rescue Authority
SVGMP	Sonoma Valley Final Groundwater Management Plan
SVP	Society of Vertebrate Paleontology
SVRWP	Sonoma Valley Recycled Water Project
SVUSD	Sonoma Valley Unified School District
SWEEPS	Statewide Environmental Evaluation and Planning System
SWF/LF	Solid Waste Facilities/Landfill Sites
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
SWRCY	Recycling Facilities in California Database
T&E	Threatened and Endangered
TAC	toxic air contaminants

TDS	total dissolved solids
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
TWLTL	two-way left-turn lane
UBC	Uniform Building Code
UC	University of California
UCANR	University of California Division of Agriculture and Natural Resources
UGB	Urban Growth Boundary
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	U.S Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UV	ultraviolet light
VOC	volatile organic compounds
VOMWD	Valley of the Moon Water District
WDRs	Water Discharge Requirements
WGCEP	Working Group on California Earthquake Probabilities
WMI	Waste Management Incorporated
WMUDS/SWAT	Waste Management Unit Database System
WQCP	Water Quality Control Plans
WR	Water Resources
WRAP	Western Regional Air Partnership
WRF	Water Reclamation Facility
WRP	Water Reclamation Plant
WSPP	Water Supply Planning Program
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
ZEVs	zero-emission vehicles

Appendix C
References

Executive Summary

Brown and Caldwell, 2017. North Bay Water Reuse Program Phase 2 Feasibility Study. June.

Chapter 1 Introduction and Project Background

U.S. Department of the Interior, Bureau of Reclamation, 2012. Reclamation Managing Water in the West: Reclamation's NEPA Handbook. Available online at https://www.usbr.gov/nepa/docs/NEPA_ Handbook2012.pdf. Accessed June 29, 2017.

Chapter 2 Project Description

Brown and Caldwell, 2017. North Bay Water Reuse Program Phase 2 Feasibility Study. June.

Chapter 3 Environmental Consequences

Section 3.2 Geology, Soils, Mineral Resources, and Paleontological Resources

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Appendix D
List of EIR/EIS Preparers

A list of persons who prepared various sections of the EIR/EIS, significant background materials, or participated to a significant degree in preparing the EIR/EIS is presented below.

North Bay Water Reuse Authority (NBWRA)

Sonoma County Water Agency (CEQA Lead Agency)

Anne Crealock	Project Manager, Senior Environmental Specialist
Jessica Martini-Lamb	Environmental Resources Manager
Kevin Booker	Principal Engineer
Jake Spaulding	Grants and Funded Projects Manager
Cory O'Donnell	County Counsel

Brown and Caldwell (Feasibility Study)

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Bureau of Reclamation (NEPA Lead Agency)

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Vanessa Emerzian	Project Manager
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NBWRA Member Agencies

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Steve Hartwig
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Leah Walker

Marin Municipal Water District

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See Sonoma County Water Agency above.

Napa Sanitation District

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Sonoma County Water Agency

See Sonoma County Water Agency above.

Novato Sanitary District

Sandeep Karkal
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Environmental Science Associates (EIR/EIS Preparer)

TABLE 10-1: LIST OF PREPARERS

Name	Qualifications	Participation
ESA		
James E. O'Toole	B.A, Geography; 20 years of experience	Environmental Program Manager; Project Description; Growth; Alternatives
David D. Davis, AICP	B.S., M.S., Geography; 29 years of experience	Project Manager; Project Description; Alternatives
Lisa Bautista	28 years of experience	Technical Editing
Stephanie Bishop	B.A., Environmental Studies/Biology, M.S., Conservation Biology; 10 years of experience	
Michael Burns, CHG, CEG, PG	B.S., Geology; 30+ years of experience	Geology, Soils and Seismicity; Hazards
Brandon Carroll	B.S., Geology with Paleontology emphasis, less than a year of experience	Technical Editing
Meryka Dirks	B.S., Earth Systems Science and Policy; 13 years of experience	Growth
Matthew Fagundes	B.S., Environmental Studies, M.A., Physical Geography; 12 years of experience	Air Quality; GHG, Energy Conservation, Noise
Jill Feyk-Miney	B.S., M.S., Environmental Studies; 2 years' experience	Land Use and Agricultural Resources
Ariel Frink	B.A., Environmental Studies, M.L.A., Landscape Architecture/Environmental Planning; 6 years of experience	Aesthetics
Maria Hensel	B.A., Environmental Studies and Planning; A.A, A.S, Sustainable Agriculture, Landscape Design; 13 years of experience	Deputy Project Manager; Alternatives; Climate Change; Public Services and Utilities; Recreation
Jack Hutchison	M. Eng., Transportation Engineering, B.S., Civil Engineering; 30 years of experience	Traffic and Transportation; Administrative Record
Perry Jung	B.F.A., Design; 20 years of experience	Graphics
Heidi Koenig, RPA	B.A., Anthropology, M.A., Cultural Resources; 8 years of experience	Cultural and Paleontological Resources; Indian Trust Assets
Wes McCullough	B.A., Geography with GIS emphasis; 5 years of experience	GIS
Alena Maudru	B.S., Environmental Management and Protection with emphasis in Sustainable Environments and Biology	References; Administrative Record
Anthony Padilla,	14 years of experience	Production
Chris Rogers	B.S., Biology with Botany emphasis, Graduate Studies, Ecology and Systematics; 27 years of experience	Chris Rogers
Matthew Russell, RPA	B.A., M.A., Ph.D., Anthropology (Archaeology Program), M.A. Nautical Archaeology and Maritime History; 24 years of experience	
Liza Ryan	B.S, Biology, MPH, Environmental Toxicology, MS, Ecology; 10 years of experience	Biological Resources
Logan Sakai	9 years of experience	Production
Eric Schniewind	B.A., Geological Sciences; 13 years of experience	Groundwater; Water Quality; Surface Hydrology
Alexandra Sung-Jereczek	B.A., Geography and Environmental Studies; 1 year of experience	References; Administrative Record
Ron Teitel	B.A., Geography; 27 years of experience	Graphics
Alexandra Thompson	B.A., Peace and Conflict Studies, M.A., Urban Planning; 10 years of experience	Socioeconomic; Environmental Justice
Tessa Verhoef	B.S., Molecular Environmental Biology, M.P.H., Environmental Health Sciences; 1 year of experience	Hazards

Appendix ES
Executive Summary

TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.2: Geology and Soils										
3.2.1: Seismicity. In the event of a major earthquake in the Bay Area Region, the proposed facilities would not exacerbate existing risks related to fault rupture, severe ground shaking, liquefaction, or earthquake induced landslides capable of causing injury, structural damage, pipeline rupture and service interruption.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.2.2: Erosion. Project construction activities could result in short-term erosion and loss of topsoils.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.2.3: Unstable Soils. Project improvements could be located on a geologic unit or soil that can become unstable as a result of the project or that could potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse causing damage to structures and service disruptions for reasons caused or exacerbated by the project.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.2.4: Expansive Soils. Project improvements could be located on expansive soils creating or exacerbating substantial risks to life or property.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		

NOTES:

[a] NI = no impact, LTS = less than significant, LSM = less than significant with mitigation, SU = Significant, Unavoidable, BI = beneficial

[b] Mitigation measure would apply to impacts identified as LSM.

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.2: Geology and Soils (cont.)										
3.2.5: Mineral Resources. The Project could result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.2.6: Paleontological Resources. The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
Section 3.3: Surface Hydrology										
3.3.1: Changes in drainage patterns. Project construction and operation could alter the existing drainage patterns in a manner that would result in substantial erosion, siltation, or flooding on- or off-site.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit** (in **Section 3.5, *Water Quality***) **Mitigation Measure 3.3.1a: Stream and Drainage Crossings.** The Member Agencies shall implement the following measure during pipeline installation at stream or drainage crossings: 1. Schedule construction during the dry season and so as to avoid storm events to the extent feasible, or as required by regulatory permits (approximately June 15 to October 15); 2. Pipelines suspended from bridges shall be designed such that they do not interfere with conveyance of flows beneath the bridge, as determined by a certified professional engineer; 3. At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.3: Surface Hydrology (cont.)			
3.3.1 (cont.)		4. If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone. 5. Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and 6. Following construction, restore the construction area to pre-existing conditions. **Mitigation Measure 3.3.1b: Impervious Surface Area – WRF Improvements.** Design of proposed facilities, including tertiary facilities and storage at Soscol WRF, shall be integrated into existing drainage infrastructure such that drainage patterns do not result in new erosion, siltation, or flooding. Design shall include appropriate collection and conveyance of stormwater to WWTP infrastructure, per each facility's NPDES Permit requirements for stormwater. **Mitigation Measure 3.3.1c: Siting Requirements for Storage at Jameson Ranch – Storage Alternative.** To avoid alterations to existing drainage patterns in the vicinity of the storage facilities at Jameson Ranch, Napa SD shall locate the storage levees such that existing waterways remain continuously connected and any changes in existing drainage patterns caused by the levees do not result in new erosion, siltation, or flooding. Compliance with this measure can be demonstrated by: 1. Locating the levees such that no existing waterways are blocked, rerouted, or otherwise altered, as shown in the project design drawings; or 2. Hydrologic and hydraulic analyses performed in accordance with standard engineering practice document that waterways affected by the project would not result in new erosion, siltation, or flooding. 3. Should Napa SD elect to locate the levees such that no existing waterways are blocked, rerouted, or otherwise altered, as part of future environmental review of this programmatic project the project design shall depict the levees as part of the project.	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.3: Surface Hydrology (cont.)										
3.3.2: Reduction in flows within stream channels. Project operation would reduce the amount of annual discharge due to the recovery and use of recycled water that is currently discharged.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.3.2: SWRCB Change of Use Petition.** Member Agencies shall complete SWRCB Change of Use Petition for use of recycled water, pursuant to Section 1700 of the California Water Code. Direct diversions of less than 3.0 cubic feet per second (cfs) or storage of less than 200 AFY may qualify for a minor petition, as appropriate. Member Agencies shall complete SWRCB Change of Use Petition process prior to recycled water distribution.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.3.3: Flooding and Effects to Surface Waters. The proposed action could expose the public or structures to the risk of flooding due to placement of facilities within the one percent annual chance of exceedance flood level. The proposed action would also change the amount of discharge to local surface waters.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.3.3: Floodplain Hydraulic Analysis for Seasonal Storage** As part of the design process for seasonal storage, Member Agencies shall demonstrate through hydrologic and hydraulic analyses that the proposed modification and/or encroachment would not result in an increase in flood levels during the occurrence of the one percent annual chance of exceedance flood event. Analysis shall be performed by a California licensed engineer in accordance with standard engineering practices.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LS	LS		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.3.4: Flooding - Sea level rise. Sea-level rise could affect operation of project facilities.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.3.4: Design Measures Addressing Sea Level Rise** Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.3.5: Flooding – Other Hazards. The NBWRP Phase 2 would not cause or exacerbate any existing risk of inundation by seiche, tsunami, or mudflow.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.3.1a: Stream and Drainage Crossings** (refer to Impact 3.3.1) **Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit** (in **Section 3.5, *Water Quality***)	Less than Significant with Mitigation
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.4: Groundwater Resources										
3.4.1: Groundwater Quality. The use and storage of recycled water could affect groundwater quality for potable and agricultural uses.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.4.2: High Groundwater Conditions. The NBWRP Phase 2 could result in localized increases in groundwater levels over the long term that could affect structures or contribute to flooding.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.4.3: Hydrostatic Pressure. Proposed facilities may be affected by shallow groundwater levels and natural groundwater fluctuations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.4.3:** The Member Agencies will implement the following measures: 1. All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria as overseen and approved by a state licensed geotechnical engineer. 2. Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices and current building code requirements. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	NI	NI	NI	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.3.4: Groundwater recharge. Impervious surfaces constructed under the NBWRP Phase 2 could affect groundwater recharge in the project area.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td>Section 3.5: Water Quality</td><td></td><td></td><td></td></tr>
<tr><td>3.5.1: Short Term Construction-Related Effects. Disturbance of soils during construction of new project-related infrastructure could generate short term erosion-related water quality impacts. Construction activities could result in the accidental release of fuels or hazardous materials. Project construction activities could require dewatering that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>NI</td><td>NI</td><td>NI</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Proposed Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>NI</td></tr>
</table>
</td><td>Mitigation Measure 3.5.1: NPDES Construction Activity Stormwater Permit. Member Agencies or their contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of Notice of Intent to comply with the provisions of this General Permit and preparation of a SWPPP. The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance.

The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation:

1. Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite.
2. Sediment control BMPs such as silt fencing or detention basins that trap soil particles.
3. Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure.
4. Management of hazardous materials and wastes to prevent spills and provide the means to contain any spills that might occur.
5. Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality.</td><td>Less than Significant</td></tr>
</table>

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Water Quality (cont.)										
3.5.1 (cont.)									6. Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls. 7. Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.	
3.5.2: Incidental Runoff. Project operation would increase the use of recycled water for irrigation within the project area, with the potential to impact surface water quality.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	NI		
3.5.3: Public Health. The proposed project would increase the use of recycled water on lands within the project area, with the potential to affect public health.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.5.4: Agricultural Uses. The proposed project would offset the use of potable water supplies for agricultural irrigation. Recycled water quality could have the potential to affect crop production.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.5.5: Secondary Effects to Groundwater Quality. Irrigation with recycled water could contribute to loading of specific constituents to groundwater.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.5: Water Quality (cont.)										
3.5.6: Pipeline Rupture. Pipeline ruptures could generate accidental releases of recycled water.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	NI	NI	NI	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.6: Biological Resources										
3.6.1: Impacts on Wetlands, Streams and Riparian Habitats. Construction of the Proposed Project could result in impacts to jurisdictional wetlands and other waters of the United States, as well as impacts to waters of the State and riparian habitat.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.6.1:** Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and State, and impacts to riparian habitat. Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to Section 401 of the Clean Water Act. Proposed facilities would most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The CDFW has jurisdiction in the project area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFW jurisdiction. If work is proposed in these areas, project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFW. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below. 1. Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include: a. Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90-degree angle) to the drainage or wetland as feasible.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.6: Biological Resources (cont.)			
3.6.1 (cont.)		b. Placement of project components as distant as feasible from channels and wetlands. c. For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback from jurisdictional features.[1] Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments listed as "parallel" to wetland/water features. 2. Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used. 3. Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings (e.g., Lynch Creek). Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat. The following additional measures shall apply to channel crossings in which the trenching construction method is used: a. Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15. b. At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.	

[1] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.1 (cont.)</td><td></td><td>c. At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing.
d. If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.
4. Construction BMPs shall be implemented as discussed in Mitigation Measure 3.5.1a in Section 3.5, Water Quality, to reduce risk of erosion and sediment transport into all construction areas in proximity of drainages.
5. For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.
6. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.
7. To offset temporary and permanent impacts to wetlands and other waters of the U.S. and State, and impacts to riparian habitat, compensatory mitigation will be provided through on-site restoration to emulate pre-project conditions, or as required by regulatory permits and SAAs.</td><td></td></tr>
<tr><td>3.6.2: Impacts to Special-status Fish and California Freshwater Shrimp. Construction of NBWRP Phase 2 facilities could affect special-status aquatic species including central California coast steelhead, Chinook salmon, and California freshwater shrimp, or designated critical habitat for steelhead.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>LSM</td><td>NI</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.2: Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp.
Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFW, and USACOE), and implementing protective measures. For Lynch Creek, North Slough, and Arroyo Seco, special-status fish are presumed present. California freshwater shrimp are presumed present in Lynch Creek.</td><td>Less than Significant</td></tr>
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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.6: Biological Resources (cont.)			
3.6.2 (cont.)		Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat: 1. Project designs shall be configured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible. Trenchless constructions methods will be employed wherever possible. In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements. 2. All activities across waterways will be restricted to low-flow periods of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in accordance with CDFW and RWQCB permit requirements). Restricting construction activities to this work window will minimize effects to California freshwater shrimp and steelhead; 3. Reclamation or appropriate agency shall ensure the appropriate permit authorizations are secured for stream crossings, and a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California freshwater shrimp during construction operations; 4. At least 15 days prior to onset of activities, Reclamation or appropriate agency shall submit the name(s) and credentials of biologists who would conduct activities authorized by the BO. No project activities shall begin until Reclamation has received written approval from the USFWS and CDFW that the biologist(s) is approved to conduct the work; 5. A Service-approved biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the California red-legged frog and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action;	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.2 (cont.)</td><td></td><td>6. If trenchless methods cannot be implemented due to geotechnical conditions, and the channel is not dry, water from around the section of trench that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to affect downstream resources. Sediment curtains will be placed downstream of the construction zone to prevent disturbed sediment from being transported and deposited outside of the construction zone;
7. If ground water is encountered, or if water remains in the channel after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997);
8. Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential California freshwater shrimp or steelhead habitat;
9. A qualified biological monitor will be on site during all activities crossing waterways. The biological monitor will be authorized to halt construction if effects to California freshwater shrimp or salmonids are evident.</td><td></td></tr>
<tr><td>3.6.3: Impacts on Reptiles and Amphibians. Construction of the NBWRP Phase 2 has the potential to impact California red-legged frog and western pond turtles in upland and aquatic habitat.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>LSM</td><td>NI</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.3: Implement protection measures to avoid and minimize impacts to western pond turtles and California red-legged frogs.
1. The implementation of measures identified for the protection of special-status fish and California freshwater shrimp would also protect California red-legged frogs and western pond turtles within aquatic habitat. When working within 200 feet of stream crossings, workers shall receive specific training in the identification, life history, local project area occurrence, and protection of western pond turtles and California red-legged frogs. Also, to minimize the likelihood of encountering turtles or frogs in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads, the project will be outside of frog and pond turtle habitat</td><td>Less than Significant</td></tr>
</table>

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.6: Biological Resources (cont.)			
3.6.3 (cont.)		2. Trenchless methods will be employed at crossings presumed or known to support California red-legged frog. In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements; 3. To the extent practicable, work activities within or adjacent to aquatic habitat that is potentially occupied by red-legged frogs will be completed between April 1 and October 31, which avoids the time period when California red-legged frogs are most likely to move through upland areas. 4. Prior to construction activities at stream crossings where aquatic impacts are expected, a qualified biologist shall perform California red-legged frog and western pond turtle surveys within suitable habitat within projected work areas. If California red-legged frogs or western pond turtles are encountered during construction activities, work in the immediate area shall cease until the area is determined to be free of sensitive species. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall. If California red-legged frog tadpoles or eggs are found, the biologist shall contact the USFWS to determine if moving any of these life-stages is appropriate. 5. At least 15 days prior to onset of activities, Reclamation or appropriate agency shall submit the name(s) and credentials of biologists who would conduct activities authorized by the BO. No project activities shall begin until Reclamation has received written approval from the USFWS that the biologist(s) is approved to conduct the work; 6. Reclamation or appropriate agency shall ensure the appropriate permit authorizations are secured for stream crossings, and a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog or western pond turtle during construction operations; 7. All trash that could attract predators will be regularly contained and removed from the work site.	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.4: Impacts on Birds. Construction of the NBWRP Phase 2 has the potential to affect special-status marsh birds, burrowing owl, and other nesting birds in and near the project sites.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>LSM</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.4: Impacts to Nesting Birds. The appropriate Member Agency shall implement the following protection elements to avoid disturbing common and special-status nesting birds:
1. Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31).
2. For ground-disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. Construction activities will be constrained to the smallest area possible to minimize disturbance to potential nesting habitat.
3. For work in Ridgway's rail, California black rail, western snowy plover or western burrowing owl habitat, a Service-approved biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the bird species and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action.
4. All work areas, including staging areas will be surveyed prior to construction for bird nests during nesting season. If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. For non-special status migratory birds, buffer size will be determined in consultation with CDFW. Buffer zones may be modified in coordination with CDFW based on existing conditions at work locations.
If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.</td><td>Less than Significant</td></tr>
</table>

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

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<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.4 (cont.)</td><td></td><td>5. For work in locations that provide habitat for listed marsh birds including Ridgway's rail, and special-status birds such as burrowing owl and black rail, protocol-level surveys will be conducted to determine species presence or absence.
6. If occupied burrowing owl burrows are discovered, construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the non-breeding season (September 1 through January 31), the exclusion zone would extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250 feet around occupied burrows. Passive relocation of owls is not proposed. A qualified biologist will monitor owl activity on the site to ensure the species is not adversely affected by the project.</td><td></td></tr>
<tr><td>3.6.5: Impacts to Mammals. Construction of the NBWRP Phase 2 has the potential to affect special-status mammals, including salt marsh harvest mouse, and roosting or breeding bats in and near the project alignments.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
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<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.5: Impacts to mammals.
1. The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on salt marsh harvest mouse during construction. Where avoidance of sensitive habitat (i.e., areas in or near pickleweed) is not feasible (e.g., by bridging or bore and jack), consultation with the USFWS would be initiated. If salt marsh harvest mouse is present or presumed to be present in the project area following informal coordination with USFWS, then formal consultation and a Biological Assessment in support of a Biological Opinion may be needed. Such a consultation would proceed as part of the Corps 404 permitting process. Similar coordination and permitting shall be performed with CDFW to address potential impacts to salt marsh harvest mouse. Staging areas shall be located outside potential salt marsh harvest mouse habitat.
2. To avoid potential impacts on salt marsh harvest mouse and Suisun ornate shrew, a qualified biologist shall conduct specific preconstruction surveys to delineate potential habitat in the project area. For areas within 100 feet of potential habitat, the project proponent shall install exclusionary fences to prevent species movement into the project area, and to prevent spoils from entering the salt marsh. Fencing will consist of a material that does not allow small mammals to pass through or over, and the bottom will be buried to a depth of at least six inches.</td><td>Less than Significant</td></tr>
</table>

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.6: Biological Resources (cont.)			
3.6.5 (cont.)		3. A qualified biologist shall conduct a training session for construction personnel all working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the species and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action. 4. Once a Biological Opinion is issued for the work, a qualified biologist will direct crews in the hand removal of pickleweed and remain on-site to provide biological monitoring during construction. The biological monitor shall inspect the exclusion fence to ensure their integrity, and shall conduct an education workshop for contractors outlining species' biology, legislative protection, and construction restrictions to reduce potential impacts. Protective measures for the salt marsh harvest mouse will equally protect the Suisun ornate shrew. 5. At the close of each workday, escape ramps/boards will be provided in all open trenches. Every morning prior to the start of construction, a qualified biologist will inspect all open trenches within 250 feet of emergent pickleweed (Salicornia pacifica) habitat for trapped mice. In the event a salt marsh harvest mouse or Suisun ornate shrew is found on-site, with approval from the Service, the biologist will remove animals from trenches before the start of construction. 6. A Service-approved biologist will be onsite during all ground-disturbing activities, including vegetation removal and during morning trench inspections, and otherwise available during the course of the construction work. The biologist will be responsible for informing the crews of the need to halt work if sensitive species are observed, and documenting compliance with the conservation measures and contacting the USFWS if any sensitive species are observed. 7. The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on special-status bats in and near project facilities during construction. 8. In conjunction with breeding bird surveys (**Mitigation Measure 3.6.4**), a qualified biologist will conduct preconstruction surveys for special-status bats at each bridge crossing location and in rural (i.e., non-road) areas where any large trees (e.g., > 24 inch diameter at breast height) will be removed. If an active roost is	

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<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.5 (cont.)</td><td></td><td>observed, a suitably-sized buffer (e.g., 100 to 150 feet) will be placed around the roost if it appears that trenching or other project activities may cause abandonment. Demolition activities must cease until juvenile bats are self-sufficient and will not be directly or indirectly impacted by activities.</td><td></td></tr>
<tr><td>3.6.6 Impacts to Rare Plants. Project construction could result in impacts to listed and other special-status plants.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.6. Impacts to Rare Plants.
Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented:
1. A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Appendix 3.6C, in all suitable habitat that would be potentially disturbed by the project, including staging areas.
2. Surveys shall be conducted following the most recent CDFW- or other approved protocol.
3. If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required.
4. If special-status plants are found during focused surveys, the following measures shall be implemented:
a. Information regarding the special-status plant population shall be reported to the CNDDB.
b. If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat.
c. If special-status plant populations cannot be avoided, consultations with CDFW and/or USFWS would be required. A plan to compensate for the loss of special-status plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be</td><td>Less than Significant</td></tr>
</table>

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<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.6: Biological Resources (cont.)</td></tr>
<tr><td>3.6.6 (cont.)</td><td></td><td>developed in consultation with the appropriate agencies prior to the start of local construction activities.
d. If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.</td><td></td></tr>
<tr><td>3.6.7: Impacts on Heritage and Other Significant Trees. The proposed project could affect heritage and other significant trees.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
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<tr><td>Proposed Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.6.7: The following measures will be implemented to avoid or reduce impacts to heritage or other significant trees:
1. If trees are identified for removal or trimming, a certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height), and number of protected trees. Also, in consultation with the appropriate jurisdiction, the arborist will determine if any are heritage or landmark trees.
2. If any protected trees are identified that will be potentially removed or damaged by construction of the proposed project, design changes will be implemented where feasible to avoid the impact.
3. Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances (see Appendix 3.6A). Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.</td><td>Less than Significant</td></tr>
</table>

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Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.7 Land Use and Agricultural Resources										
3.7.1: Implementation of NBWRP Phase 2 would not physically divide an established community.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.7.2: Implementation of NBWRP Phase 2 would not conflict with applicable land use plans adopted for the purpose of avoiding or mitigating a significant environmental effect.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.7.3: Impact to Farmland. NBWRP Phase 2 could affect the agricultural use of important farmland.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.8 Transportation and Traffic										
3.8.1: Construction of NBWRP Phase 2 would have temporary and intermittent effects on traffic and transportation conditions in the project area.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8.1a:** The appropriate Member Agency for each NBWRA Phase 2 element shall obtain and comply with local road encroachment permits for roads that are affected by construction activities. The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 2014). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval)	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Transportation and Traffic (cont.)			
3.8.1 **(cont.)**		required by **Mitigation Measure 3.7.1b**, below, would direct how traffic flow is safely maintained during project construction. **Mitigation Measure 3.8.1b:** The construction contractor for each NBWRA Phase 2 element shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall: 1. Identify hours of construction (between 7:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM, unless stipulated in coordination with responsible jurisdiction on a case-by-case basis); 2. Identify hours for deliveries; 3. Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging; 4. Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones); 5. Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints; 6. Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times; 7. Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Transportation and Traffic (cont.)			
3.8.1 (cont.)		the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through inclusion of such provisions in the construction contract. The assignment of temporary crossing guards at designated intersections may be needed to enhance pedestrian safety during project construction; 8. Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and 9. Specify the street restoration requirements pursuant to agreements with the local jurisdictions. **Mitigation Measure 3.8.1c:** The appropriate Member Agency for each NBWRA Phase 2 element shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow. **Mitigation Measure 3.8.1d:** The appropriate Member Agency for each NBWRA Phase 2 element shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. **Mitigation Measure 3.8.1e:** The appropriate Member Agency for each NBWRA Phase 2 element shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way. **Mitigation Measure 3.8.1f:** The appropriate Member Agency for each NBWRA Phase 2 element shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Transportation and Traffic (cont.)										
3.8.2: Construction of NBWRP Phase 2 would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers).	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8.2a:** Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, the appropriate Member Agency for each NBWRA Phase 2 element shall coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. **Mitigation Measure 3.8.2b:** A minimum of two months prior to project construction, the appropriate Member Agency for each NBWRP Phase 2 element shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.8.1a**). **Mitigation Measure 3.8.2c:** Implement **Mitigation Measure 3.8.1b**.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.8.3: Construction of NBWRP Phase 2 would have temporary effects on alternative transportation or alternative transportation facilities.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8.3:** Implement Mitigation Measure 3.8.1f.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.8.4: Construction of NBWRP Phase 2 would temporarily increase the potential for accidents on project roadways.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8.4:** Implement Mitigation Measures 3.8.1b through 3.8.1f.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.8 Transportation and Traffic (cont.)										
3.8.5 Construction of the NBWRP Phase 2 would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8.5:** Roads damaged by construction shall be repaired to a structural condition equal to that which existed prior to construction activity as per conditions of the encroachment permit (see **Mitigation Measure 3.8.1a**).	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
Section 3.9 Air Quality										
3.9.1: Construction of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could exceed air quality standards or contribute substantially to an existing or projected air quality violation.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.9.1-1a: BAAQMD Basic Construction Measures.** To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended Basic Construction Measures shall be implemented and included in all contract specifications for projects constructed under the Phase 2 Program: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. 4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph). 5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. 6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	SU	SU	SU	(a)	(a)	SU		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.9 Air Quality (cont.)			
3.9.1 (cont.)		7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. 8. Post a publicly visible sign with the telephone number and persons to contact at the North Bay Water Reuse Authority and/or the applicable member agency regarding dust complaints. These persons shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations. **Mitigation Measure 3.9.1-1b: Additional Construction.** The North Bay Water Reuse Authority and/or applicable member agency shall implement all feasible measures from the BAAQMD's Additional Construction Mitigation Measures listed below: 1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. 2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. 3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. 4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. 5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. 6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site. 7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12-inch compacted layer of wood chips, mulch, or gravel.	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.9 Air Quality (cont.)										
3.9.1 (cont.)									8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. 9. Minimize the idling time of diesel powered construction equipment to 2 minutes. 10. The off-road diesel-powered equipment (more than 50 horsepower) to be used in the construction of any project (i.e., owned, leased, and subcontractor vehicles) under the Phase 2 Program shall be equipped with engines that achieve USEPA Tier 4 emissions standards. 11. Use low volatile organic compound (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings). 12. Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NO_x and PM_{10}.	
3.9.2: Operations of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could contribute to an existing or projected air quality violation.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.9.3: Construction of the NBWRP Phase 2 projects would result in emissions that could conflict with the 2017 Clean Air Plan.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.9.3:** Implement **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	SU	SU	SU	(a)	(a)	SU		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.9 Air Quality (cont.)										
3.9.4: Construction of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.9.4:** Implement **Mitigation Measure 3.9.1-1b**.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LS	LS	(a)	(a)	LSM		
3.9.5: Operation of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.10 Greenhouse Gas Emissions										
3.10.1: Incremental contribution to climate change from GHG emissions associated with NBWRP Phase 2	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.10.2: Conflict with Executive Order B-30-15 or Executive Order S-3-05 Emissions Reduction Goals.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

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<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td>Section 3.11 Noise</td><td></td><td></td><td></td></tr>
<tr><td>3.11.1: Construction activity would result in a substantial temporary increase in ambient noise levels in the vicinity of Program projects during construction.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>LS</td><td>LSM</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td></tr>
<tr><td>Proposed Action</td><td>LS</td><td>LSM</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LS</td><td>LS</td><td>LS</td><td>(a)</td><td>(a)</td><td>LS</td></tr>
</table>
</td><td>Mitigation Measure 3.11-1: Construction Noise Reduction Measures (applies to Marin County Lower Novato Creek Project 1 – Distribution Project).

The applicable Member Agency shall develop and implement a Construction Noise Reduction Plan. The Construction Noise Reduction Plan shall be submitted to the County of Marin for review and approval prior to construction. A disturbance coordinator shall be designated for the project to implement the provisions of the plan. At a minimum, the Construction Noise Reduction Plan shall implement the following measures:

1. Distribute to the potentially affected residences and other sensitive receptors within 100 feet of project construction boundary a “hotline” telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant’s name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project site of the construction schedule.

2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.

3. Maintain maximum physical separation, as far as practicable, between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community.

4. Impact tools (e.g., jack hammers, pavement breakers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used.</td><td>Less than Significant</td></tr>
</table>

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<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.11 Noise (cont.)</td></tr>
<tr><td>3.11.1 (cont.)</td><td></td><td>5. Use construction noise barriers such as paneled noise shields, blankets, or enclosures adjacent to noisy stationary equipment. Noise control shields, blankets or enclosures shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.
6. Truck hauling access routes to project sites along local roadways shall use roadways with the fewest residences feasible to minimize vehicle noise exposure to nearby residences.</td><td></td></tr>
<tr><td>3.11.2: Construction activity would violate standards established in the local general plans or noise ordinances, and/or would adversely affect nearby sensitive receptors.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>LSM</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>NI</td><td>NI</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.11-2a: Construction Time-of-Day Restrictions All NBWRP Phase 2 project construction activities shall be limited to the acceptable hours identified within the applicable jurisdiction policies and/or municipal codes unless granted a special exemption by the applicable jurisdiction.</td><td>Less than Significant</td></tr>
<tr><td>3.11.3: Construction activity could expose sensitive receptors to excessive ground-borne vibration levels.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td></tr>
<tr><td>Proposed Action</td><td>LS</td><td>LS</td><td>LS</td><td>LS</td><td>LSM</td><td>LS</td><td>LS</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LS</td><td>LS</td><td>LS</td><td>(a)</td><td>(a)</td><td>LS</td></tr>
</table>
</td><td>Mitigation Measure 3.11-3: Vibration Control. The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack-and-bore when there are historical building structures within 100 feet of the proposed activities and/or any building structure within 50 feet of the proposed activities. If the contractor provides the applicable Member Agency with acceptable documentation indicating that alternative trenchless technology is not feasible for the given crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack-and-bore as far as possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan shall also include the development of a vibration monitoring plan to be implemented during construction of a particular crossing.</td><td>Less than Significant</td></tr>
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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.11 Noise (cont.)										
3.11.4: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.11.5: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operations.	**Alternative**	*MMWD*	*Novato SD*	*Petaluma*	*SVCSD*	*SCWA*	*American Canyon*	*Napa SD*	**Mitigation Measure 3.11-1: Stationary- Source Noise Controls.** The applicant applicable Member Agency shall retain an acoustical engineer to design stationary -source noise controls and ensure the applicable noise standards are met. Prior to operations of the stationary noise source, the applicable Member Agency shall conduct a single 24-hour noise monitoring survey to ensure compliance with local noise standards.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LSM	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.12 Hazards and Hazardous Materials										
3.12.1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.12.2: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	See **Mitigation Measure 3.8.1b**.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	NI	NI	LSM	NI	NI	LSM	NI		
	Storage Alternative	(a)	NI	LS	NI	(a)	(a)	NI		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

<table>
<tr><th>Environmental Impacts</th><th>Impacts by Alternative and Member Agency[a]</th><th>Mitigation Measure[b]</th><th>Significance After Mitigation</th></tr>
<tr><td colspan="4">Section 3.12 Hazards and Hazardous Materials (cont.)</td></tr>
<tr><td>3.12.3: Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Proposed Action</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td><td>NI</td><td>LSM</td><td>NI</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>NI</td><td>NI</td><td>NI</td><td>(a)</td><td>(a)</td><td>NI</td></tr>
</table>
</td><td>Mitigation Measure 3.12-3a: Health and Safety Plan. The construction contractor(s) shall prepare and implement a site-specific Health and Safety Plan as required by and in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. The Health and Safety Plan shall include, but is not limited to, the following elements:
1. Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site health and safety plan;
2. A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals;
3. Specified personal protective equipment and decontamination procedures, if needed;
4. Emergency procedures, including route to the nearest hospital; and
5. Procedures to be followed in the event that evidence of potential soil contamination (such as soil staining, noxious odors, debris or buried containers) is encountered. These procedures shall be in accordance with hazardous waste operations regulations and specifically include, but are not limited to, the following: immediately stopping work in the vicinity of the unknown hazardous materials release, notifying the appropriate regulatory agency, and retaining a qualified environmental firm to perform sampling and remediation, as needed.
Mitigation Measure 3.12-3b: Soil and Groundwater Management Plan. In support of the Health and Safety Plan described above, the construction contractor(s) shall develop and implement a Soil Management Plan that includes materials testing and disposal procedures specifying how the construction contractor will remove, handle, transport, and dispose of all excavated material in a safe, appropriate, and lawful manner. The plan shall identify protocols for soil testing, list action levels[2] to determine whether the soil may be reused or must be disposed of at an offsite facility permitted to</td><td>Less than Significant</td></tr>
</table>

[2] Action levels would include San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels to identify soil requiring cleanup, and landfill hazardous and designated waste acceptance criteria.

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Hazards and Hazardous Materials (cont.)										
3.12.3 (cont.)									accept the materials, identify the approved disposal site, and include written documentation that the disposal site will accept the waste. Contract specifications shall mandate full compliance with all applicable local, state, and federal regulations related to the identification, transportation, and disposal of hazardous materials, including those encountered in excavated soil.	
3.12.4: Be located within two miles of a public or private airport and result in a safety hazard for people residing or working in the project area.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.12.5: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan during construction.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.8-1a through 1f:** The Mitigation Measures are described in **Impact 3.8-1** of **Section 3.8, *Transportation and Traffic***.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.12.6: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.12.6: Fire Safety Plan.** Prior to construction, the construction contractor for each project component that would be within or adjacent to an area designated as susceptible to wildland fires shall prepare and implement a fire safety plan to reduce the potential for starting wildland fires during construction activities. The fire safety plan shall provide, but not be limited to, the following elements: In consultation with local fire agencies, a Fire Safety Plan will be developed for each of the service areas designated as susceptible to wildland fires. The Fire Safety Plans will describe various potential scenarios and action plans in the event of a fire. During project construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	LSM	NI	LSM	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	LSM	NI	(a)	(a)	NI		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.12 Hazards and Hazardous Materials (cont.)			
3.12.6 (cont.)		spark arrestor shall be equipped with a spark arrestor in good working order. All vehicles and crews working at the project sites shall have access to functional fire extinguishers at all times. In addition, construction crews will be required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.	
Section 3.13 Public Services and Utilities			
3.13.1: Temporary effect on response times for emergency service providers. Project construction activities could temporarily affect response times for emergency service providers.	**Alternative** / **MMWD** / **Novato SD** / **Petaluma** / **SVCSD** / **SCWA** / **American Canyon** / **Napa SD** ***No Project*** NI NI NI NI NI NI NI ***No Action*** LSM LSM LSM LSM LSM LSM LSM ***Proposed Action*** LSM LS LSM LSM LS LSM LS ***Storage Alternative*** (a) LSM LS LS (a) (a) LSM	**Mitigation Measure 3.13.1:** The Member Agencies or Participating Municipalities will coordinate with local emergency service providers in its service area to inform them of the proposed construction activities and schedule, and provide temporary alternate access routes around construction areas as necessary.	Less than Significant
3.13.2: Short-term police and fire assistance. Project construction activities could require short-term police and fire protection services to assist in traffic management or in the event of an accident.	**Alternative** / **MMWD** / **Novato SD** / **Petaluma** / **SVCSD** / **SCWA** / **American Canyon** / **Napa SD** ***No Project*** NI NI NI NI NI NI NI ***No Action*** LSM LSM LSM LSM LSM LSM LSM ***Proposed Action*** LSM LSM LSM LSM LSM LSM LS ***Storage Alternative*** (a) LSM LS LS (a) (a) LSM	**Mitigation Measure 3.13-2:** The Member Agency (i.e., project owner) or it construction contractor shall provide 72-hour notice to the local emergency service providers prior to construction of individual pipeline segments. The Member Agency or its construction contractor shall provide, upon request, a copy of the Traffic Control/Traffic Management Plan to the emergency service agencies for review prior to construction. Discussion on the Traffic Control/Traffic Management Plan is provided in Section 3.8, Transportation.	Less than Significant
3.13.3: Temporary Disruption to Utility Services. Project construction could result in temporary, planned, or accidental disruption to utility services.	**Alternative** / **MMWD** / **Novato SD** / **Petaluma** / **SVCSD** / **SCWA** / **American Canyon** / **Napa SD** ***No Project*** NI NI NI NI NI NI NI ***No Action*** LSM LSM LSM LSM LSM LSM LSM ***Proposed Action*** LSM LSM LSM LSM LSM LSM LS ***Storage Alternative*** (a) LS LS LS (a) (a) LSM	**Measure 3.13.3:** The Member Agencies (i.e., project owner) or its construction contractor shall identify utilities along the proposed pipeline routes and project sites prior to construction and implement the following measures: a. Utility excavation or encroachment permits shall be obtained as required from the appropriate agencies. These permits include measures to minimize utility disruption. The service provider and its contractors shall comply with permit conditions regarding utility disruption. b. Utility locations shall be verified through the use of the Underground Service Alert services and/or field survey.	Less than Significant

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<tr><td colspan="4">Section 3.13 Public Services and Utilities (cont.)</td></tr>
<tr><td>3.13.3 (cont.)</td><td></td><td>c. As necessary, detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.
d. In areas where the pipeline would traverse parallel to underground utility lines within five feet, the project applicant shall employ special construction techniques, such as trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the excavated areas.
e. Residents and businesses in the project corridor shall be notified of any planned utility service disruption two to four days in advance, in conformance with county and state standards.</td><td></td></tr>
<tr><td colspan="4">Section 3.14 Cultural Resources and Tribal Cultural Resources</td></tr>
<tr><td>3.14.1: Impacts or Adverse Effects to Archaeological Resources, Human Remains, and Tribal Cultural Resources</td><td>
<table>
<tr><th>Alternative</th><th>MMWD</th><th>Novato SD</th><th>Petaluma</th><th>SVCSD</th><th>SCWA</th><th>American Canyon</th><th>Napa SD</th></tr>
<tr><td>No Project</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td><td>NI</td></tr>
<tr><td>No Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td></tr>
<tr><td>Proposed Action</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>LSM</td><td>SU</td></tr>
<tr><td>Storage Alternative</td><td>(a)</td><td>LSM</td><td>LSM</td><td>LSM</td><td>(a)</td><td>(a)</td><td>LSM</td></tr>
</table>
</td><td>Mitigation Measure 3.14.1a: Inadvertent Discoveries. If prehistoric or historic-era archaeological resources are encountered, the contractor shall immediately cease all work within 100 feet of the discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation, the contractor shall immediately contact the NBWRA and the appropriate Member Agency. The contractor shall not resume work until authorization is received from the appropriate Member Agency.
1. In the event of unanticipated discovery of archaeological resources during construction, the Member Agency shall retain the services of a qualified professional archaeologist (defined as an archaeologist that meets the Secretary of the Interior’s Standards) to evaluate the significance of the find prior to resuming any activities.</td><td>Less than Significant</td></tr>
</table>

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Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.14 Cultural Resources and Tribal Cultural Resources (cont.)			
3.14.1 (cont.)		2. If it is determined that the Project could damage a historical resource or a unique archaeological resource (pursuant to CEQA) or a historic property (pursuant to NHPA), mitigation shall be implemented with a preference for preservation in place. This may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If the site cannot be avoided, a qualified professional archaeologist shall prepare and implement a detailed research design and treatment plan in consultation with the Member Agency and the affiliated Native American tribe(s), as appropriate. Treatment for most resources would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Project. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals. **Mitigation Measure 3.14.1b: Discovery of Human Remains.** If potential human remains are encountered, the appropriate Member Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with PRC Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission. As provided in PRC Section 5097.98, the Commission shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. **Mitigation Measure 3.14.1c: Cultural Resources Assessment for Staging Areas.** When locations for staging are defined, the staging areas should be subject to a cultural resources investigation completed by a qualified professional archaeologist that includes, at a minimum:	

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Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.14 Cultural Resources and Tribal Cultural Resources (cont.)			
3.14.1 (cont.)		1. An updated records search at the NWIC; 2. An intensive survey of the staging areas; 3. A report disseminating the results of this research; 4. Recommendations to avoid impacts to identified resources that qualify as historical resources, unique archaeological resources, tribal cultural resources, or historic properties; and 5. If resources cannot be avoided, provide recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources. **Mitigation Measure 3.14.1d: Cultural Resources Monitoring.** Prior to authorization to proceed, or issuance of permits, the appropriate Member Agency shall prepare a cultural resources monitoring plan. Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas delineated as sensitive for cultural resources. A qualified professional archaeologist shall prepare the plan. The plan shall address (but not be limited to) the following issues: 1. Training program for all construction and field workers involved in site disturbance; 2. Person(s) responsible for conducting monitoring activities, including Native American monitors, if necessary; 3. Person(s) responsible for overseeing and directing the monitors; 4. Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports; 5. Procedures and construction methods to avoid sensitive cultural resource areas (i.e. boring conduit underneath recorded or discovered cultural resource site); 6. Clear delineation and fencing of sensitive cultural resource areas requiring monitoring; 7. Physical monitoring boundaries;	

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.14 Cultural Resources and Tribal Cultural Resources (cont.)			
3.14.1 (cont.)		8. Protocol for notifications in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation); 9. Methods to ensure security of cultural resources sites; 10. Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction. If an intact archaeological deposit is encountered, all soil-disturbing activities within 100 feet of the find shall cease until the deposit is evaluated. The archaeological monitor shall immediately notify the appropriate Member Agency of the encountered archaeological resource. The protocol outlined in **Mitigation Measure 3.14.1a** and **Mitigation Measure 3.14.1b** would be implemented. **Mitigation Measure 3.14.1e: Program Elements and Storage Alternative: Cultural Resources Assessment.** If this alternative is selected, the appropriate Member Agency will conduct a cultural resources investigation prepared by a qualified professional archaeologist that includes, at a minimum: 1. An updated records search at the NWIC; 2. An intensive cultural resources survey of the Project area; 3. A report disseminating the results of this research; 4. Recommendations to avoid impacts to identified resources that qualify as historical resources, unique archaeological resources, tribal cultural resources, or historic properties; and 5. Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.	
3.14.2: Impacts or Adverse Effects to Architectural Resources		No Mitigation Measures are required.	No Impact

Alternative	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
No Project	NI	NI	NI	NI	NI	NI	NI
No Action	NI	NI	NI	NI	NI	NI	NI
Proposed Action	NI	NI	NI	NI	NI	NI	NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI

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Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.15 Recreation										
3.15.1: Temporary disturbance. Project construction could result in short-term disturbance adjacent to recreational facilities.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.13.1a:** The appropriate Member Agency shall coordinate with the appropriate local and regional agencies to identify detour routes for the bikeways and trails during construction where feasible, as part of the Traffic Control/Traffic Management Plan (see **Measure 3.8.1**). In addition, the Member Agency shall conduct outreach to notify the public of closures, detours, etc.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	LS	NI	LSM	LSM	NI	LSM	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	LSM		
Section 3.16 Aesthetics										
3.16.1: Temporary Impact to Scenic Vistas. NBWRP Phase 2 construction activities could temporarily affect scenic vistas in the NBWRP area.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	NI	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	NI	LS	LS		
	Storage Alternative	(a)	LS	LS	NI	(a)	(a)	LS		
3.16.2: Impact to views along scenic roadways. Implementation of NBWRP could affect views along eligible or designated Caltrans Scenic Highways or locally-defined scenic routes.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.16.2a:** Following construction activities, disturbed areas shall be restored to baseline conditions, by repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area. **Mitigation Measure 3.16.2b:** Berms around constructed reservoirs shall be vegetated with native seed mixes to soften the visual effect of the reservoirs from adjacent roadways. **Mitigation Measure 3.16.2c:** Design elements shall be incorporated to enhance visual integration of the pump stations and other above ground structures with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	NI	NI	NI	NI	NI		
	Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LS		
	Storage Alternative	(a)	LSM	LSM	NI	(a)	(a)	NI		

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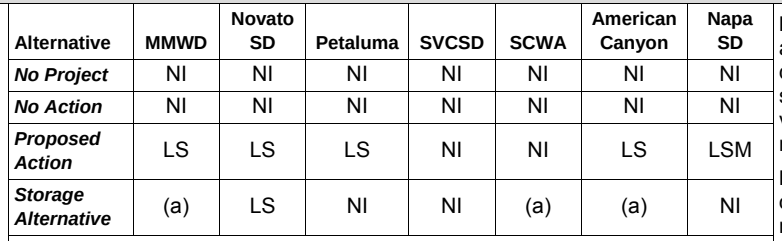
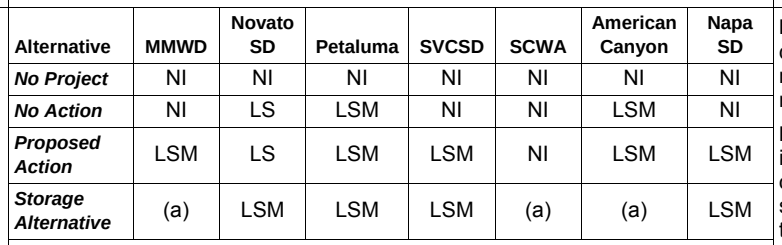
Environmental Impacts	Impacts by Alternative and Member Agency[a]	Mitigation Measure[b]	Significance After Mitigation
Section 3.16 Aesthetics (cont.)			
3.16.3: Source of Light or Glare. NBWRP components could introduce new sources of light and glare on the project sites.		**Mitigation Measure 3.16.3a:** The exterior lighting installed around the operational and capacity storage reservoirs, distribution pump station, storage tanks, and booster pump station shall be of a minimum standard required to ensure safe visibility. Lighting also shall be shielded and directed downward to minimize impacts of light and glare. **Measure 3.16.3b:** All exterior lighting is directed downward and oriented to ensure that limited light source is directly visible from neighboring residential areas. If necessary, landscaping would be provided around proposed facilities. The vegetation would be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas. **Mitigation Measure 3.16.3c:** Dark colored, non-reflective building materials should be used for project components that cause potentially significant impact from glare to visual resources.	Less than Significant
3.16.4: Long-term impact to aesthetic character. Development of the proposed facilities, particularly pump stations and storage reservoirs, would permanently alter the aesthetic character of the project area.		**Mitigation Measure 3.16.4a:** Following construction activities, disturbed areas shall be restored to baseline conditions, by repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area. **Mitigation Measure 3.16.4b:** Design elements shall be incorporated to enhance visual integration of the pump stations or other project-related above ground structures with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities. **Mitigation Measure 3.14.4c:** After construction of any facility that is above grade and visible to sensitive receptors, visual screening and vegetation measures will be implemented to reduce impacts to scenic views. Trees or other suitable vegetation along the fenceline of the facility should be incorporated to reduce the industrial appearance of the structures. Similarly, berms for new storage ponds or pond reconfiguration will be re-vegetated to reduce the barren appearance of the berms.	Less than Significant

NOTES:

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[b] Mitigation measure would apply to impacts identified as LSM.

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.17 Energy Conservation										
3.17.1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.9.1-1a: BAAQMD Basic Construction Measures.** **Mitigation Measure 3.9.1-1b: Additional Construction Mitigation Measures.** (See Impact 3.9.1 in **Section 3.9, *Air Quality***, for descriptions.)	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
3.17.2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.17.3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NAE	NAE	NAE	NAE	NAE	NAE	NAE		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.18 Environmental Justice										
3.18.1: Project construction could result in significant environmental impacts that could disproportionately affect minority or low-income populations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 3.9.1-1a: BAAQMD Basic Construction Measures.** **Mitigation Measure 3.9.1-1b: Additional Construction Mitigation Measures.**	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	LSM	LSM	LSM	NI	NI	LSM	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.18 Environmental Justice (cont.)										
3.18.2: Project operation could result in significant environmental impacts that could disproportionately affect minority low-income populations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		
3.18.3: The project could result in an increase water and sewer fees that would disproportionately affect minority and low-income populations.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.18.4: The Project could adversely affect farm worker employment.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	LS	LS	LS	LS	LS	LS	LS		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
Section 3.19 Socioeconomics										
3.19.1: Project construction and operation would increase jobs, wages and salaries, resulting in regional economic benefits.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	LS	NI	NI	LS	NI		
	Proposed Action	LS	LS	LS	LS	NI	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Section 3.19 Socioeconomics (cont.)										
3.19.2: Project implementation could affect the agricultural economy.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	LS	LS	LS	LS	NI	LS	LS		
	Storage Alternative	(a)	NI	LS	LS	(a)	(a)	LS		
3.19.3: Impact to Winery-related Industry. Recycled water deliveries to vineyards would support the winery-related tourism industry.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Beneficial
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	LS	LS	NI	NI	LS		
	Storage Alternative	(a)	NI	LS	LS	(a)	(a)	LS		
3.19.4: Increase in water/sewer charges. Project implementation could increase municipal and industrial customer water or sewer charges.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	LS	NI	NI	LS	NI		
	Proposed Action	LS	LS	LS	LS	NI	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
3.19.5: Impact on Recreational Spending. Recycled water deliveries that would enhance restoration areas could increase recreational spending in the region.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	No Impact
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	NI	NI	NI	NI	NI	NI		
	Proposed Action	NI	NI	NI	NI	NI	NI	NI		
	Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts										
4.1: Construction-related Cumulative Impacts. Concurrent construction of several projects within the Sonoma, Napa, and Marin County areas could result in cumulative short-term impacts associated with construction activities. If implemented at the same time as other construction projects, construction of facilities could contribute to potential short-term cumulative effects associated with erosion, cultural resource disturbance, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, aesthetics, air quality, biological resources, hazardous materials, water quality, public services and utilities. However, construction-related impacts would not result in long term alteration of the environment, and could be mitigated to less than significant levels through the use of mitigation measures identified throughout Chapter 3.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	**Mitigation Measure 4.1:** Member Agencies shall coordinate construction activities along selected alignments to identify overlapping pipeline routes, project areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
4.2: Cumulative Long-term Impacts resulting from Seismic Events. Concurrent construction of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term risk of upset impacts related to groundshaking and surface fault rupture during major earthquakes.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	LS	NI	NI	LS	NI		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
4.3: Cumulative Long-term Impacts on Water Resources. Concurrent construction of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to water resources, water quality, and flooding.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	BI	BI	NI	NI	BI	NI		
	Proposed Action	BI	BI	BI	BI	BI	BI	BI		
	Storage Alternative	(a)	BI	BI	BI	(a)	(a)	BI		

NOTES:

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts (cont.)										
4.4: Cumulative Long-term Impacts on Groundwater. Concurrent construction of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to groundwater resources and groundwater quality.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	BI	BI	NI	NI	BI	NI		
	Proposed Action	BI	BI	BI	BI	BI	BI	BI		
	Storage Alternative	(a)	BI	BI	BI	(a)	(a)	BI		
4.5: Cumulative Long-term Impacts on Biological Resources. Concurrent construction of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area, and other water and wastewater infrastructure projects, could result in cumulative long-term impacts to biological resources.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	Mitigation Measures in Section 3.6, Biological Resources	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
4.6: Cumulative Long-term Impacts on Land Use. Concurrent construction of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to land use and agricultural resources.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	No Mitigation Measures are required.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LS	LS	NI	NI	LS	NI		
	Proposed Action	LS	LS	LS	LS	LS	LS	LS		
	Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS		
4.7: Cumulative Impacts from Greenhouse Gas Emissions. Concurrent operation of NBWRP Phase 2 with other projects could result in a cumulatively considerable net increase in GHG emissions or criteria pollutants for which the region is in non-attainment under applicable standards.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	Mitigation Measures in Section 3.9, Air Quality.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		

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TABLE ES-5: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES (CONTINUED)

Environmental Impacts	Impacts by Alternative and Member Agency[a]								Mitigation Measure[b]	Significance After Mitigation
Chapter 4 Cumulative Impacts (cont.)										
4.8: Cumulative Long-term Impacts on Cultural and Historic Resources. Concurrent operation of NBWRP Phase 2 with other projects proposed in the Sonoma, Napa, and Marin County area and other water and wastewater infrastructure projects could result in cumulative long-term impacts to cultural resources.	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	Mitigation Measures in Section 3.14, Cultural and Tribal Resources.	Less than Significant
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	LSM	LSM	NI	NI	LSM	NI		
	Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM		
	Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM		
Chapter 5 Growth Inducement and Secondary Effects of Growth										
5.1: NBWRP Phase 2 would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of Marin, Sonoma and Napa Counties. No appreciable growth effects, which include effects that would be significant and unavoidable. However, development under the General Plans accommodated by the proposed project would result in secondary environmental effects, which include effects that would be significant and unavoidable. in population or employment would occur as a direct result of construction or operation of the proposed facilities. However, the growth accommodated by the proposed project would result in secondary environmental	**Alternative**	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**	Provision of recycled water within each of the NBWRP Phase 2 service areas would contribute to secondary effects of growth associated with buildout under approved General Plans within each service area. Mitigation programs have been established for these impacts, however, these impacts have been identified as remaining significant and unavoidable after mitigation by individual General Plan EIRs.	Significant, Unavoidable
	No Project	NI	NI	NI	NI	NI	NI	NI		
	No Action	NI	SU	SU	NI	NI	SU	NI		
	Proposed Action	SU	SU	SU	SU	SU	SU	SU		
	Storage Alternative	(a)	SU	SU	SU	(a)	(a)	SU		

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Appendix 1
Public Scoping

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

2017072051

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: North Bay Water Reuse Program Phase 2

Lead Agency: Sonoma County Water Agency — Contact Person: Anne Crealock
Mailing Address: 404 Aviation Boulevard — Phone: (707) 547-1948
City: Santa Rosa — Zip: 95403 — County: Sonoma

Project Location: County: Marin, Napa, Sonoma — City/Nearest Community: American Canyon, Napa, Sonoma, Petalu
Cross Streets: Regional project — Zip Code:
Longitude/Latitude (degrees, minutes and seconds): ____° ____ ′ ____ ″ N / ____° ____ ′ ____ ″ W Total Acres:
Assessor's Parcel No.: — Section: — Twp.: — Range: — Base:
Within 2 Miles: State Hwy #: US 101, CA 12, CA 29 — Waterways: Various tributaries to San Pablo Bay
Airports: Napa County Airport — Railways: Sonoma-Marin Area Rai — Schools:

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☒ NOI ☐ EA ☐ Draft EIS ☐ Other: Other: ☐ Joint Document ☐ Final Document ☐ Other:

Governor's Office of Planning & Research
JUL 20 2017
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Infrastructure

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational:
☐ Recreational:
☒ Water Facilities: Type Pipes, pumps, sto MGD ____
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Agricultural Land ☐ Air Quality ☐ Archeological/Historical ☐ Biological Resources ☐ Coastal Zone ☐ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☐ Geologic/Seismic ☐ Minerals ☐ Noise ☐ Population/Housing Balance ☐ Public Services/Facilities
☐ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☐ Toxic/Hazardous ☐ Traffic/Circulation
☐ Vegetation ☐ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Growth Inducement ☐ Land Use ☐ Cumulative Effects ☒ Other: TBD determines in

Present Land Use/Zoning/General Plan Designation:

Residential, agricultural, commercial

Project Description: *(please use a separate page if necessary)*

The North Bay Water Reuse Authority is proposing Phase 2 the North Bay Water Reuse Program to continue increasing the beneficial use of recycled water and integrated water management. These projects would include construction and operation of treatment capacity improvements, distribution facilities, and storage facilities (seasonal and operational) to provide recycled water environmental, agricultural, and municipal reuse in the San Pablo Bay region, which encompasses approximately 318 square miles. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing wastewater treatment plants. This recycled water would be used in a manner consistent with the California Code of Regulations, Title 22, pertaining to the use of tertiary-treated recycled water.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X	Air Resources Board	X	Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
X	California Emergency Management Agency	X	Parks & Recreation, Department of
	California Highway Patrol		Pesticide Regulation, Department of
X	Caltrans District #4		Public Utilities Commission
	Caltrans Division of Aeronautics	X	Regional WQCB #2
	Caltrans Planning	X	Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy	X	S.F. Bay Conservation & Development Comm.
	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of	X	State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of	X	SWRCB: Water Quality
	Energy Commission	X	SWRCB: Water Rights
X	Fish & Game Region #3		Tahoe Regional Planning Agency
	Food & Agriculture, Department of	X	Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of	X	Water Resources, Department of
	General Services, Department of		
X	Health Services, Department of		Other:
	Housing & Community Development		Other:
	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date July 21, 2017 Ending Date August 21, 2017

Lead Agency (Complete if applicable):

Consulting Firm: ESA, Inc.
Address: 1425 N. McDowell Blvd., Suite 200
City/State/Zip: Petaluma, CA 94954
Contact: David D. Davis, AICP
Phone: (707) 796-7001

Applicant: Sonoma County Water Agency, Anne Creaklock
Address: 404 Aviation Blvd.
City/State/Zip: Santa Rosa, CA 95403
Phone: (707) 547-1948

Signature of Lead Agency Representative: Anne G Creaklock **Date:** 7-17-17

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

17.32(b)(5)) regarding conservation activities for the California tiger salamander.

Applicant's Proposed Activities

The applicant has applied for a permit for incidental take of the California tiger salamander. The potential take will occur in association with activities necessary for the reconditioning of approximately 2,430 linear feet of the existing 300 Line. The site includes 2.9 acres of suitable upland habitat for the California tiger salamander. The HCP includes avoidance and minimization measures for the covered species and mitigation for unavoidable loss of occupied upland habitat through the purchase of mitigation credits at a Service-approved conservation bank.

Our Preliminary Determination

The Service has made a preliminary determination that issuance of the incidental take permit is neither a major Federal action that will significantly affect the quality of the human environment within the meaning of section 102(2)(C) of the National Environmental Policy Act (42 U.S.C. 4321 *et seq.;* NEPA), nor will it individually or cumulatively have more than a negligible effect on the species covered in the HCP. Therefore, the permit qualifies for a categorical exclusion under NEPA.

Public Comments

If you wish to comment on the permit application, draft HCP, and associated documents, you may submit comments by one of the methods in **ADDRESSES**.

Public Availability of Comments

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public view, we cannot guarantee that we will be able to do so.

Authority

We provide this notice under section 10 of the ESA (16 U.S.C. 1531 *et seq.*) and NEPA regulations (40 CFR 1506.6).

Dated: October 31, 2017.

Stephen P. Henry,

Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California.

[FR Doc. 2017–24084 Filed 11–3–17; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF THE INTERIOR

National Park Service

[NPS–SER–OBRI–23968; PS.SSELA0328.00.1]

Minor Boundary Revision at Obed Wild and Scenic River

AGENCY: National Park Service, Interior.

ACTION: Notification of boundary revision.

SUMMARY: Notice is hereby given that the boundary of the Obed Wild and Scenic River is modified to include an additional 63.01 acres of land identified as Tract 101–63. The tract is located north of the Obed River and south of Hardwick Road in Morgan County, Tennessee. The boundary revision is depicted on Map No. 179/135,074 dated April 2017.

DATES: The date of this boundary revision is November 6, 2017.

ADDRESSES: The map is available for inspection 8 a.m. to 4 p.m. at the following locations: National Park Service, Southeast Region Land Resources Program Center, 1924 Building, 100 Alabama Street SW., Atlanta, Georgia 30303 and National Park Service, Department of the Interior, Washington, DC 20240.

FOR FURTHER INFORMATION CONTACT: National Park Service, Jeannie Whitler, Acting Chief, Southeast Region Land Resources Program Center, 1924 Building, 100 Alabama Street SW., Atlanta, Georgia 30303, telephone 404–507–5657.

SUPPLEMENTARY INFORMATION: Specifically, 54 U.S.C. 100506(c)(1) provides that, after notifying the House Committee on Natural Resources and the Senate Committee on Energy and Natural Resources, the Secretary of the Interior is authorized to make this boundary revision upon publication of notice in the **Federal Register**. The Committees have been notified of this boundary revision. This boundary revision and subsequent acquisition of Tract 101–63 by donation will enable the National Park Service to manage and protect significant resources located in the Obed Wild and Scenic River and is consistent with the Wild and Scenic Rivers Act.

Dated: October 5, 2017.

Stan Austin,

Regional Director, Southeast Region.

[FR Doc. 2017–24053 Filed 11–3–17; 8:45 am]

BILLING CODE 4312–52–P

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR0230000, 17XR0680B1, RX.20671000.0000000]

Draft Environmental Impact Report/Environmental Impact Statement for North Bay Water Recycling Program Phase 2, California

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice of intent; request for comments.

SUMMARY: The Sonoma County Water Agency, acting as administrator for the North Bay Water Reuse Authority and the lead State agency, and the Bureau of Reclamation, the lead Federal agency, will prepare a joint Environmental Impact Report/Environmental Impact Statement for Phase 2 of the North Bay Water Recycling Program. The purpose of the Phase 2 Program is to build upon the existing regional wastewater reuse network developed under the Program's Phase 1 to provide additional opportunities for recycled water for agricultural, urban, and environmental uses as an alternative to discharging treated wastewater to San Pablo Bay.

DATES: Submit written comments on the scope of the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) on or before December 6, 2017.

ADDRESSES: Send written comments on the scope of the EIR/EIS to Anne Crealock, Sonoma County Water Agency, 404 Aviation Boulevard, Santa Rosa, CA 95403, or email to *Phase2EIR@nbwra.org.* Documents may be viewed at *www.nbwra.org/.*

FOR FURTHER INFORMATION CONTACT: Ms. Anne Crealock, Sonoma County Water Agency, at (707) 547–1948, or via email at *Phase2EIR@nbwra.org;* or Douglas Kleinsmith, Bureau of Reclamation, at (916) 978–5034, email at *dkleinsmith@usbr.gov.*

SUPPLEMENTARY INFORMATION:

Background

Recognizing the continuing need for an integrated and regional approach to water management, wastewater and potable water agencies in the North San Pablo Bay region of California have joined together to propose expansion of existing recycled water use in the region. The North Bay Water Reuse Authority (NBWRA), established under a Memorandum of Understanding (MOU) in August 2005, now comprises 11 wastewater and potable water utilities as members, and associate

member agencies—the Las Gallinas Valley Sanitary District, the Novato Sanitary District, the Sonoma Valley County Sanitation District, the Napa Sanitation District, North Marin Water District, Napa County, Marin County, Marin Municipal Water District, the City of American Canyon, the City of Petaluma, and Sonoma County Water Agency (SCWA). The SCWA is also currently acting as the administrative agency. Under the MOU, NBWRA continues to explore opportunities to coordinate ''interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources.''

NBWRA developed the regional North Bay Water Recycling Program for expanding cooperative water reuse within the North San Pablo Bay region. The SCWA, as the California Environmental Quality Act (CEQA) Lead Agency and the Bureau of Reclamation (Reclamation), as the Lead Agency under the National Environmental Policy Act (NEPA), completed a Draft EIR/EIS for Phase 1 of the North Bay Water Recycling Program Project (Phase 1 Project). SCWA certified the EIR in December 2009. Reclamation released a Final EIS in June 2010 and signed a Record of Decision in January 2011 for the Phase 1 Project. Reclamation provided funding assistance for Phase 1 under of Title XVI of Public Law 102–575, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects.

The Phase 2 Program now proposed by NBWRA seeks to increase the beneficial use of recycled water in the North Bay Region beyond Phase 1. Reclamation may also provide funding assistance under Title XVI of Public Law 102–575. The proposed Phase 2 Program would consist of distribution facilities, treatment capacity improvements, and storage (seasonal and operational) to make between 5,039 and 6,516 acre-feet per year of recycled water available for environmental, agricultural, and municipal reuse, consistent with the California Code of Regulations, Title 22, pertaining to the use of tertiary-treated recycled water.

At this time, there are no known Indian trust assets or environmental justice issues associated with the Proposed Action.

Scoping Process

NBWRA filed a Notice of Preparation (California State Clearinghouse no. 2017072051) on July 20, 2017, pursuant to the California Environmental Quality Act (CEQA) (P.R.C. section 21092, C.C.R. section 15082) and held four public scoping meetings in August 2017. To avoid duplication with State and local procedures, we plan to use the scoping process initiated by NBWRA under CEQA. No additional public scoping meetings are planned at this time. However, Reclamation will fully consider all input received on this notice of intent. The CEQA Notice of Preparation is available at *http://www.nbwra.org/wp/wp-content/uploads/NBWRA-Phase-2-NOP.pdf.*

Public Disclosure

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: October 31, 2017.

Federico Barajas,

Deputy Regional Director, Mid-Pacific Region.

[FR Doc. 2017–24085 Filed 11–3–17; 8:45 am]

BILLING CODE 4332–90–P

INTERNATIONAL TRADE COMMISSION

Notice of Receipt of Complaint; Solicitation of Comments Relating to the Public Interest

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has received a complaint entitled Self-Anchoring Beverage Containers, *DN 3271;* the Commission is soliciting comments on any public interest issues raised by the complaint or complainant's filing pursuant to the Commission's Rules of Practice and Procedure.

FOR FURTHER INFORMATION CONTACT: Lisa R. Barton, Secretary to the Commission, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436, telephone (202) 205–2000. The public version of the complaint can be accessed on the Commission's Electronic Document Information System (EDIS) at *https://edis.usitc.gov,* and will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436, telephone (202) 205–2000.

General information concerning the Commission may also be obtained by accessing its Internet server at United States International Trade Commission (USITC) at *https://www.usitc.gov* . The public record for this investigation may be viewed on the Commission's Electronic Document Information System (EDIS) at *https://edis.usitc.gov.* Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205–1810.

SUPPLEMENTARY INFORMATION: The Commission has received a complaint and a submission pursuant to § 210.8(b) of the Commission's Rules of Practice and Procedure filed on behalf of Mighty Mug, Inc. on October 31, 2017. The complaint alleges violations of section 337 of the Tariff Act of 1930 (19 U.S.C. 1337) in the importation into the United States, the sale for importation, and the sale within the United States after importation of self-anchoring beverage containers. The complaint names as respondents Calvert Retail, Inc. of Montchanin Mills, DE; U.S. Imprints, Inc. of Franklin, TN; RushKing Promotions, Inc. of Brooklyn, NY; GOImprints, Inc. of Franklin, TN; Artful Home, Inc. of Madison, WI; Swag Brokers, LLC of Phoenix, AZ; 4AllPromos, Inc. of Centerbrook, CT; Hirsch Gift, Inc. of Houston, TX; Telebrands, Corp. of Fairfield, NJ; Sunrise Gifts, Inc. of Orlando, FL; Sunrise Gifts and Souvenirs, Inc. of Foley, AL; Motivators, Inc. of Westbury, NY; AnyPromo.com, Inc. of Ontario, CA; Quality Logo Products, Inc. of Aurora, IL; and Shenzhen Smartop Industrial Co., Ltd. of China. The complainant requests that the Commission issue an exclusion order and cease and desist orders.

Proposed respondents, other interested parties, and members of the public are invited to file comments, not to exceed five (5) pages in length, inclusive of attachments, on any public interest issues raised by the complaint or § 210.8(b) filing. Comments should address whether issuance of the relief specifically requested by the complainant in this investigation would affect the public health and welfare in the United States, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, or United States consumers.

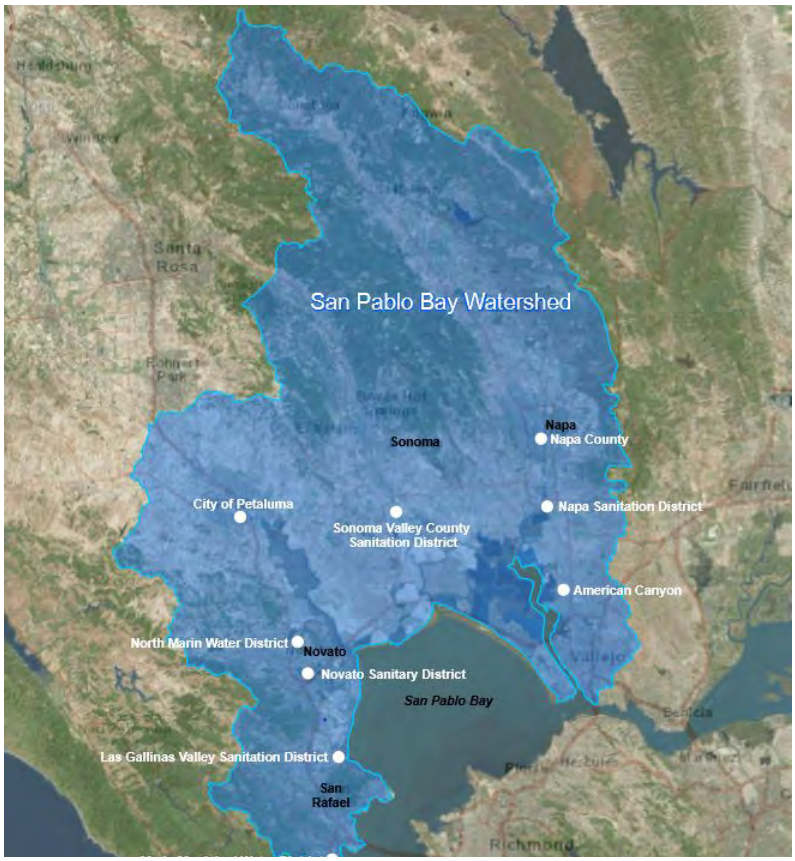
NORTH BAY WATER REUSE AUTHORITY PHASE 2 PROGRAM EIR/EIS

Scoping Report

SCH No. Number 2017072051

Prepared for
North Bay Water Reuse Authority

September 2017



NORTH BAY WATER REUSE AUTHORITY PHASE 2 PROGRAM EIR/EIS

Scoping Report

SCH No. Number 2017072051

Prepared for
North Bay Water Reuse Authority

September 2017

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900
www.esassoc.com

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SCOPING REPORT

North Bay Water Reuse Authority
Phase 2 Program EIR/EIS

1. Introduction

The North Bay Water Reuse Authority (NBWRA) was originally established under a Memorandum of Understanding (MOU) in August of 2005, last amended in March of 2013, and is comprised of 11 wastewater and potable water utilities as member agencies in the North San Pablo Bay region. Under the MOU, the NBWRA continues to explore opportunities to coordinate "interagency efforts to expand the beneficial use of recycled water in the North Bay region thereby promoting the conservation of limited surface water and groundwater resources." Under Phase 2, the NBWRP would provide opportunities to deliver recycled water and integrated water management systems in the North Bay Region by providing increased recycled water supply to urban, agricultural and environmental uses.

The NBWRA is preparing an Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) to evaluate the projects proposed under Phase 2 of the NBWRP, pursuant to the California Environmental Quality Act (CEQA)[1]. The NBWRA formally began the process of determining the scope of issues and alternatives to be evaluated in the EIR/EIS (a process called "scoping") when it issued a Notice of Preparation of an EIR/EIS (NOP) for the NBWRP on July 21, 2017.

The NOP initiated agency consultation about the scope and content of information to be analyzed in the EIR/EIS and invited early public input about potential environmental concerns (Pub. Res. Code § 21080.4(a); CEQA Guidelines §§ 15082(b), 15083). CEQA Guidelines Section 15083 provides that a "Lead Agency may…consult directly with any person…it believes will be concerned with the environmental effects of the project." Scoping is the process of early consultation with the affected agencies and public prior to completion of a Draft EIR/EIS. Section 15083(a) states that scoping can be "helpful to agencies in identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR/EIS and in eliminating from detailed study issues found not to be important." Scoping is an effective way to bring together and consider the concerns of affected State, regional, and local agencies, the project proponent, and other interested persons (CEQA Guidelines § 15083(b)).

[1] As many of the projects comprising the Phase 2 Program are seeking funding from the U.S. Bureau of Reclamation, they are subject to compliance with the National Environmental Policy Act (NEPA). Therefore, NBWRA is preparing a combined document – an EIR/EIS – to address the requirements of both CEQA and NEPA in a single document. As this NOP is a required part of the CEQA EIR process, its focus is primarily aimed toward CEQA.

This Scoping Report provides an overview of the scoping process and a summary of the written and oral comments provided by agencies and individuals in response to the NOP during the 30-day scoping period, which closed on August 21, 2017. The NBWRA will use this Scoping Report as a tool to ensure the preparation of a comprehensive EIR/EIS tailored to agency and public concerns. Pursuant to CEQA Guidelines § 15082, all public comments will be considered in the EIR/EIS process.[2]

2. Description of the Project

2.1 Project Summary

The proposed North Bay Water Reuse Program (NBWRP) Phase 2 (Phase 2 Program) seeks to continue increasing the beneficial use of recycled water in the North San Pablo Bay Region by reusing water that would otherwise be discharged into San Pablo Bay and its tributaries for agricultural, urban, and environmental uses. The proposed Phase 2 Program also continues to build on commitments to long-term inter-agency cooperation and integrated water management to address common needs related to reliable water supplies and enhanced environmental restoration. As implementation of the Project would likely require external funding assistance, the investigation and development of the Project is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in approved water reuse projects.

The proposed Phase 2 projects would include construction and installation of facilities, such as new distribution pipelines to deliver recycled water, pump stations to boost pressure for conveyance, and additional seasonal and operational storage facilities to store recycled water, as well as upgrades to the existing treatment capacities at the existing wastewater treatment plants (WWTPs) in the project area. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing wastewater treatment plants. The recycled water would be used in a manner consistent with Title 22, pertaining to the use of tertiary-treated recycled water.

The NBWRA member agencies participating in the Phase 2 Program include Novato SD, SVCSD, the Water Agency, MMWD, Napa SD, the City of Petaluma, and the City of American Canyon.

2.2 Project Location

The NBWRA area essentially encompasses the northern reaches of the San Pablo Bay watershed in Marin, Sonoma, Napa, and Solano counties, comprising nearly 320 square miles. The Phase 2 project area extends approximately 10 to 15 miles inland from San Pablo Bay from as far south as San Quentin in Marin County to as far north as El Verano in Sonoma County, and as far east as American Canyon in Napa County. Urban centers in the action area include San Rafael (county seat) and Novato in Marin County, Sonoma in Sonoma County, and Napa and American Canyon

[2] Comments not within the scope of CEQA will not be addressed through the CEQA process. See Section 4, Scoping Comments.

(county seat) in Napa County. The topography of the action area consists of gently sloping river valleys, separated by northwest trending mountain ranges with steep slopes and peaks exceeding elevations of 2,500 feet above mean sea level. Flat lying mudflats and marshland line San Pablo Bay.

The Phase 2 project area receives water supplies from sources both within and outside the region. Water sources within the region include the Petaluma and Napa Rivers, Sonoma Creek, Stafford Lake on Novato Creek, and the Marin Municipal Water District's watershed lands on the north flank of Mount Tamalpais. Surface water sources outside the region include the Russian River Project (including Lake Mendocino, Lake Sonoma, and imports from the Eel River via Pacific Gas & Electric Company's Potter Valley Project), Dry Creek, Warm Springs Creek, Lake Hennessey, Milliken Reservoir, MMWD's five Lagunitas Creek watershed reservoirs, Soulajule Reservoir on Walker Creek, and the Sacramento-San Joaquin Delta via the State Water Project. The region relies on groundwater and recycled water as additional sources.

3. Scoping Process

3.1 Public Notification

On Wednesday, July 19, 2017, NBWRA published and distributed its NOP to solicit input from federal, State, and local agencies, as well as the public and interested parties, regarding the scope and content of information to be considered in the EIR/EIS for the Phase 2 Program. A copy of the NOP is provided in **Appendix A**. The NOP distribution lists are included in **Appendix B**.

The NOP was sent to the State Clearinghouse in the Governor's Office of Planning and Research, which assigned State Clearinghouse Number (SCH No.) 2017072051 as the Phase 2 Program's unique State identification number. An electronic copy of the NOP was also posted on the NBWRA Phase 2 Program's website at: http://www.nbwra.org/ and on the Sonoma County Water Agency's website at: http://www.scwa.ca.gov/environmental-documents/. The NOP described the projects proposed under the Phase 2 Program, included maps showing the locations of proposed components, identified potential areas of environmental impacts, and provided notice for four public/agency scoping meetings (discussed below).

The NOP was sent to 237 public trustee and responsible agencies/officials and interested parties within the NBWRA and adjacent areas with vested interest in public water supply and environmental issues. These included agencies and/or officials at the city, county, special district, regional, State, and federal levels (see Section 3.3, Agency Consultation). Public libraries within the Phase 2 Program area also received the NOP to make available for public review (see **Table 1**).

Approximately 425 postcards announcing availability of the NOP were also sent directly to other public agencies/officials, property owners and occupants within 300 feet of the proposed SVCWD and Water Agency project routes and locations, as well as individuals that had previously shown interest in the initial Phase 1 Program. A copy of this postcard is included at the end of Appendix A. This noticing process was conducted in manner consistent with each member agencies' preferences and public noticing requirements.

TABLE 1
NOP DISTRIBUTION TO PUBLIC LIBRARIES

Library	Community
Marin County Free Library	San Rafael
San Rafael Public Library	San Rafael
San Rafael Public Library, Pickleweed Branch	San Rafael
Novato Public Library	Novato
South Novato Public Library	Novato
Napa County Library	Napa
American Canyon Library	American Canyon
Petaluma Regional Library	Petaluma
Sonoma Valley Regional Library	Sonoma

These interested parties are summarized in **Table 2**.

TABLE 2
NOP DISTRIBUTION TO INTERESTED PARTIES

Friends of the Eel River	Planning and Conservation League	Sonoma County Conservation Council
Friends of the Napa River	Greenbelt Alliance	Novato Chamber of Commerce
Friends of Novato Creek	Audubon California	Petaluma Chamber of Commerce
Friends of the Esteros	Marin Audubon Society	Rohnert Park Chamber of Commerce
Friends of the Petaluma River	San Francisco Bay Trail	Santa Rosa Chamber of Commerce
Russian River Keepers	Save the Bay	Sonoma Valley Chamber of Commerce
Russian River Watershed Protection Committee	SF Estuary Institute	National Sustainable Agriculture Coalition
North Coast Rivers Alliance	Marin Conservation League	California Farm Bureau Federation
Salmon Protection and Watershed Network (SPAWN)	Sierra Club	Napa Valley Grape Growers
United Anglers Casa Grande	The Environmental Forum of Marin	Napa Valley Vintners Association
The Bay Institute	Valley of the Moon Alliance	Carneros (Wine) Quality Alliance
OWL Foundation	Sonoma County Alliance	California Association of Winegrape Growers
Living Rivers Council	Sonoma County Water Coalition	Sonoma County Winegrowers
G.U.L.P.	Sonoma Land Trust	United WineGrowers for Sonoma County
Petaluma Wetlands Alliance	Sonoma Ecology Center	Wine Institute

The mailing lists for interested parties and property owners/occupants near the SVCSD and Water Agencies projects near Sonoma are provided in Appendix B.

In the form of display advertisements, newspaper notices announcing the release and availability of the NOP and the scoping meeting schedule were posted in newspapers of public record in the NBWRA service area, as shown in **Table 3**.

TABLE 3
NEWSPAPER NOTICES AND DATES

Newspaper (Primary Community Served)	Publication Date (2017)
Marin Independent Journal (Marin County, Novato, San Rafael)	July 19
Napa Valley Register (American Canyon, Napa [city], Napa County)	July 19
Petaluma Argus-Courier (Petaluma)	July 20
The Press Democrat (Sonoma County)	July 19
The Sonoma Index-Tribune (Sonoma [city])	July 18
Times Herald (American Canyon)	July 19

The announcement was also sent out as a press release through the Sonoma County Water Agency's media outreach list to multiple press organizations, stakeholders, elected representatives, TV, and radio outlets and was posted on NBWRA's website accessible through www.nbwra.org. Copies of the newspaper notices are provided in **Appendix C**.

3.2 Public Scoping Meetings

NBWRA and its consultant team conducted scoping meetings to provide the public, agencies with potential jurisdiction over or interest in the Phase 2 Program, and other interested parties the opportunity to learn about the program and provide input on potential environmental issues to help define the scope of the EIR/EIS analyses. A presentation was prepared to introduce the Phase 2 Program, the NBWRA and consultant team, the proposed project components, and the CEQA and NEPA process, as well as to invite any questions or input from attendees. The presentation also outlined next steps in the environmental review process and guidance for submittal of scoping comments outside the scoping meeting forum.

The meeting sites were determined relative to the location of Phase 2 Program project components. At minimum, NBWRA sought to conduct one meeting in each affected county. Based on this, four scoping meetings were held, as shown in **Table 4**.

TABLE 4
SCOPING MEETING LOCATIONS AND DATES

Meeting Location	Date (2017)
Marin County	
San Rafael San Rafael Community Center	August 2
Napa County	
American Canyon City Hall (Council Chambers)	August 3
Sonoma County	
Petaluma Petaluma Community Center	August 9
Sonoma Sonoma Community Center	August 10

Each meeting was held from 6:30 to 8:00 p.m. to accommodate work and school schedules for members of the public. One member of the public attended the San Rafael scoping meeting. There were no public or agency participants in attendance, other than Sonoma County Water Agency (CEQA Lead Agency) staff at the remaining meetings.

Scoping materials were available at each meeting, including written comment forms, speaker cards, sign-in sheets, and printed copies of the NOP. The sign-in sheets also provided the opportunity for attendees to provide contact information to receive information in the future regarding the EIR/EIS. See **Appendix D** for a representative scoping meeting scoping meeting presentation and materials (with the exception of the NOP, which is found in Appendix A). A list of NBWRA team participants is also included.

3.3 Agency Notification

As noted above, the NOP or a postcard notice was sent to public trustee and responsible agencies/officials and interested parties within the NBWRA and adjacent areas with vested interest in public water supply and environmental issues (see **Table 5**). This consultation included special districts (e.g. fire, water, transit, etc.) and utility providers. Also included were agencies in the region that received notice during the initial NBWRA Phase 1 environmental process or whose facilities could be affected by Phase 2 Program-related construction. Specific contacts included elected officials, department heads, public service providers, divisions, etc. with the agencies shown below. The distribution lists found in Appendix B provides a full accounting of these specific contacts.

TABLE 5
PUBLIC AGENCIES NOTIFIED

Cities/Counties		
Marin County	Cotati	St. Helena
Napa County	Healdsburg	San Rafael
Sonoma County	Larkspur	Santa Rosa
American Canyon	Napa [city]	Sonoma [city]
Calistoga	Novato	Tiburon
Cloverdale	Petaluma	Windsor
Corte Madera	Rohnert Park	Yountville
Special Districts/Utilities Providers		
AT&T	Mountain Cemetery District	Sonoma County Agricultural Preservation and Open Space District
Central Marin Sanitary District	Napa Sanitation District	Sonoma Resource Conservation District
Cinnabar School District	North Marin Water District	Sonoma Valley County Sanitation District
Congress Valley Water District	Novato Sanitary District	Valley Cemetery District
Las Galinas Valley Sanitary District	Old Adobe School District	Valley of the Moon Water District
Los Carneros Water District	PG&E	Waugh School District
Marin County Flood Control & Water Conservation District	Petaluma City Schools	Wilson School District
Marin County Open Space District	Petaluma Health Care District	
Marin Municipal Water District	Petaluma Valley Hospital	
State/Regional		
Governor's Office of Planning & Research	Cal/EPA	Department of Parks and Recreation
State Assembly (Districts 2, 4, and 10)	California Coastal Conservancy	Department of Public Health
State Senate (Districts 2 and 3)	California Energy Commission	The Resources Agency
Native American Heritage Commission	California Highway Patrol	San Francisco Bay Conservation and Development Commission
Federated Indians of Graton Rancheria[a]	California Public Utilities Commission	San Francisco Bay Regional Water Quality Control Board
Iona Band of Miwok Indians[a]	CalRecycle	San Quentin State Prison
Middletown Rancheria of Pomo Indians[a]	Caltrans	Sonoma-Marin Rail Transit District
Mishewal Wappo Tribe of Alexander Valley[a]	Department of Conservation	State Lands Commission
Yocha Dehe Wintun Nation[a]	Department of Fish and Wildlife	State Office of Historic Preservation
Association of Bay Area Governments	Department of Food and Agriculture	State Water Resources Control Board
Bay Area Air Quality Management District	Department of Housing and Community Development	Department of Water Resources
California Air Resources Board	Northern Sonoma Air Pollution Control District	

TABLE 5 (CONTINUED)
PUBLIC AGENCIES NOTIFIED

Federal		
U.S. House of Representatives (Districts 2 and 5)	U.S. Environmental Protection Agency	U.S. Geological Survey
U.S. Senate (California Delegation)	Federal Aviation Administration	Natural Resource Conservation District (USDA)
U.S. Army Corps of Engineers	Federal Emergency Management Agency	National Marine Fisheries Service
U.S. Bureau of Reclamation	U.S. Fish and Wildlife Service	

NOTE:

[a] These tribal organizations were also contacted through the consultation process required under Assembly Bill 52 and Section 106 of the National Historic Preservation Act.

4. Scoping Comments

One member of the public provided oral comments on the Phase 2 Program during the August 2nd scoping meeting in San Rafael. NBWRA received four comment letters and one e-mail during the 30-day comment period from July 21 to August 21, 2017. Copies of these are provided in **Appendix E**. Commenting parties are listed in **Table 6** and summaries of the issues identified by these commenters are provided below.

TABLE 6
SCOPING COMMENTERS

Name	Organization/Affiliation	Date Received
Oral Comments		
Susan Stompe	Novato resident/Marin Conservation League	August 2, 2017
Written Comments		
Anne Bothwell	Sonoma resident	July 31, 2017
Patricia Maurice, District Branch Chief	California Department of Transportation (Caltrans)	August 17, 2017
Cedric Irving, Environmental Scientist	State Water Resources Control Board (Water Board)	August 18, 2017
Scott Wilson, Regional Manager	California Department of Fish and Wildlife (CDFW)	August 21, 2017
Sharaya Souza, Analyst	Native American Heritage Commission (NAHC)	August 23, 2017

4.1 Issues to be Considered under CEQA

Following are summaries of the issues identified by the commenters that will be considered under CEQA in the EIR.

General CEQA Issues

The Water Board suggests that the nomenclature used to describe aspects of the Phase 2 Program, as well as its relationship to the initial Phase 1 Program, be clearly stated in the EIR/EIS. The Water Board also suggests an explanation be presented in the EIR/EIS regarding how member agencies would follow CEQA Guidelines Section 15164(a) for their project-level analyses.

Caltrans requests that the Phase 2 Program's financing, scheduling, implementation responsibilities and monitoring be fully discussed for all mitigation measures, particularly those involving improvements to the State Transportation Network (STN).

In its comment letter, CDFW presented the potential permitting requirements to be considered when each Phase 2 Program project is executed. CDFW also advised that the Phase 2 Program EIR/EIS is anticipated to find impacts on fish and/or wildlife and would be subject to fees upon filing the Notice of Determination (i.e., the "Fish and Game fee").

Project Description

Caltrans requested that the project description address:

- timing and duration of project phasing, including specific project elements to be completed in each phase
- the exact location and proximity of proposed pipelines in relation to the STN
- the total number of construction trucks utilizing the STN
- total number of employees during the construction phase and when fully operational

CDFW requested inclusion of a complete description of the following project components in the project description:

- footprints of permanent project features and temporarily impacted areas, such as staging areas and access routes
- encroachments into riparian habitats, wetlands or other sensitive areas
- area and plans for any proposed buildings/structures, ground-disturbing activities, fencing, paving, stationary machinery, landscaping, and stormwater systems
- operational features of the projects, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise and greenhouse gas generation, traffic generation, and other features
- construction schedule, activities, equipment and crew sizes

Ms. Stompe inquired about the proposed phase two projects and asked for clarification regarding pipeline routes and other graphics for proposed Notato wetland enhancement sites. No other substantive public comments on the scope of the EIR/EIS were voiced at the scoping meetings.

Biological Resources

CDFW requested appropriate CEQA impact analysis and inclusion of baseline habitat assessments for special status plant fish and wildlife species potentially located within the area of the Phase 2 Program projects and surrounding lands, and recommended that pre-project surveys be conducted to determine occurrence potentials for listed and special status species. Specific measures to avoid or minimize loss of foraging habitat for Swainson's hawk were recommended. Recommendations were also provided regarding including measures to ensure complete avoidance (of take) for fully protected species, including the salt marsh harvest mouse, California black rail, and Ridgway rail.

Cultural Resources

Caltrans noted in its comment letter that the project area is highly sensitive to cultural resources and recommended that the Sonoma County Water Agency conduct a cultural resource technical study that includes a records search utilizing the Northwest Information Center of the California Historical Resources Information System, as well as field survey of the project area by a qualified archaeologist and architectural historian. AB52 consultation was recommended to assess tribal cultural resources for interested tribal groups. The comment letter also presented potential Caltrans requirements for work within its right-of-way. The Native American Heritage Commission submitted a letter providing standard guidance for cultural resources assessments and appropriate consultation under AB 52 and SB 18.

Noise/ Construction Issues

Ms. Bothwell raised issues regarding construction staging area locations and activities occurring at those sites. Of particular concern are noise and dust issues and how they would be mitigated by the Phase 2 Program.

Transportation

Caltrans requested information about whether any construction staging is anticipated adjacent to US101, SR116, and SR 29 and suggested that a Transportation Management Plan may be required if traffic restrictions and detours may be needed along or near these routes. Basic information regarding transportation permits and encroachment permits was also provided by the agency.

Cumulative Impacts

The Water Board requests that the cumulative impact analysis prove that the benefits of the Phase 2 Program components do not rely upon project activities not considered in the scope of the Phase I or Phase 2 EIR/EIS.

4.2 Issues Not Analyzed under CEQA

The comment letter submitted by the Water Board focused primarily on the requirements of the Clean Water State Revolving Fund for financing any of the Phase 2 Program projects. In particular, the Water Board letter points out that these projects would need to comply with Section 7 of the federal Endangered Species Act and Section 106 of the National Historic Preservation Act. As those Phase 2 projects being analyzed in the EIR/EIS at a "project level" are proposed for U.S. Bureau of Reclamation Title XVI funding, they would be required to meet these federal requirements. In any case, adherence to these federal requirements are not required, per se, for compliance under CEQA and will only be discussed in the EIR/EIS relative to the requirements of the Title XVI program and U.S. Bureau of Reclamation NEPA requirements.

The EIR/EIS will be used to guide decision-making by the NBWRA member agencies by providing an assessment of the potential environmental impacts that would result from projects in the Phase 2 Program. The weighing of Phase 2 Program benefits (environmental, economic, or otherwise) against adverse environmental effects is outside the scope of the EIR/EIS.

The EIR/EIS will not consider comments related to whether NBWRA or its members agencies has the proper easements or ROWs for construction, operation, or maintenance of the Phase 2 projects. Negotiations of ROWs or easements occur between NBWRA member agencies and affected property owner(s) and generally do not require discretionary approval from a State or local agency. Consequently, such agreements would be outside the scope of CEQA. Any physical impacts that would occur as part of the Phase 2 Program within these areas would be assessed in the EIR/EIS to the extent such information is available.

5. Consideration of Issues Raised in Scoping Process

A primary purpose of this Scoping Report is to document the process of soliciting and identifying comments from agencies and the public. The scoping process provides the means to determine those issues that interested participants consider to be the principal areas for study and analysis. Every issue that has been raised during scoping that falls within the scope of CEQA will be addressed and/or be considered in the EIR/EIS.

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APPENDIX A

Notice of Preparation (NOP) & Postcard Notice

North Bay Water Reuse Authority

Sonoma County Water Agency | Novato Sanitary District | Napa Sanitation District
Sonoma Valley County Sanitation District | City of Petaluma
Marin Municipal Water District | City of American Canyon

Notice of Preparation of an Environmental Impact Report/Environmental Impact Statement NBWRA North Bay Water Reuse Program – Phase 2

Introduction

The North Bay Water Reuse Authority (NBWRA) is proposing Phase 2 of the North Bay Water Reuse Program (Phase 2 Program). As contract administrator for the NBWRA, the Sonoma County Water Agency (Water Agency) will act as Lead Agency under the California Environmental Quality Act (CEQA) for preparing a joint Environmental Impact Report (EIR)/Environmental Impact Statement (EIS). The Department of Interior, Bureau of Reclamation, will be the federal Lead Agency under the National Environmental Policy Act (NEPA) for preparing an Environmental Impact Statement (EIS).

This Notice of Preparation (NOP) for the Phase 2 Program describes the proposed project, as defined under CEQA, that will be reviewed in the EIR/EIS and identifies the issue areas that will be studied in the environmental review. Agencies and interested members of the public are invited to provide input on the scope of the environmental analysis to be evaluated.

Project Background

Recognizing the continuing need for an integrated and regional approach to water management, wastewater and potable water agencies in the North San Pablo Bay region of California have joined together to propose expansion of existing recycled water use and integrated water management in the region. NBWRA comprises 11 wastewater and potable water utilities as member agencies – the Las Gallinas Valley Sanitary District (LGVSD), the Novato Sanitary District (Novato SD), the Sonoma Valley County Sanitation District (SVCSD), the Napa Sanitation District (Napa SD), the North Marin Water District (NMWD), Napa County, Marin County (associate membership), the Marin Municipal Water District (MMWD), the City of American Canyon, the City of Petaluma, and the Water Agency. The Water Agency is also acting as the administrative agency. NBWRA explores opportunities to coordinate "interagency efforts to expand the beneficial use of recycled water in the North Bay Region thereby promoting the conservation of limited surface water and groundwater resources."

In 2009, the Water Agency certified the Phase 1 EIR, allowing member agencies to use the document to meet their obligations under CEQA for project implementation under Phase 1 and established the Program as a functioning regional recycled water system. In 2011, the Bureau of Reclamation issued its Record of Decision completing the review of the Phase 1 Program under NEPA.

The proposed Phase 2 Program seeks to continue increasing the beneficial use of recycled water for the environment, agriculture, and urban irrigation and decreasing the amount of water discharged into San Pablo Bay and its tributaries. The proposed Phase 2 Program also continues to build on commitments to long-term inter-agency cooperation and integrated water management to address common needs related to reliable water supplies and enhanced environmental restoration. As implementation of Phase 2 would require external funding assistance, the investigation and development of these Projects are being carried out in conformance with the requirements of the Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in approved water reuse projects.

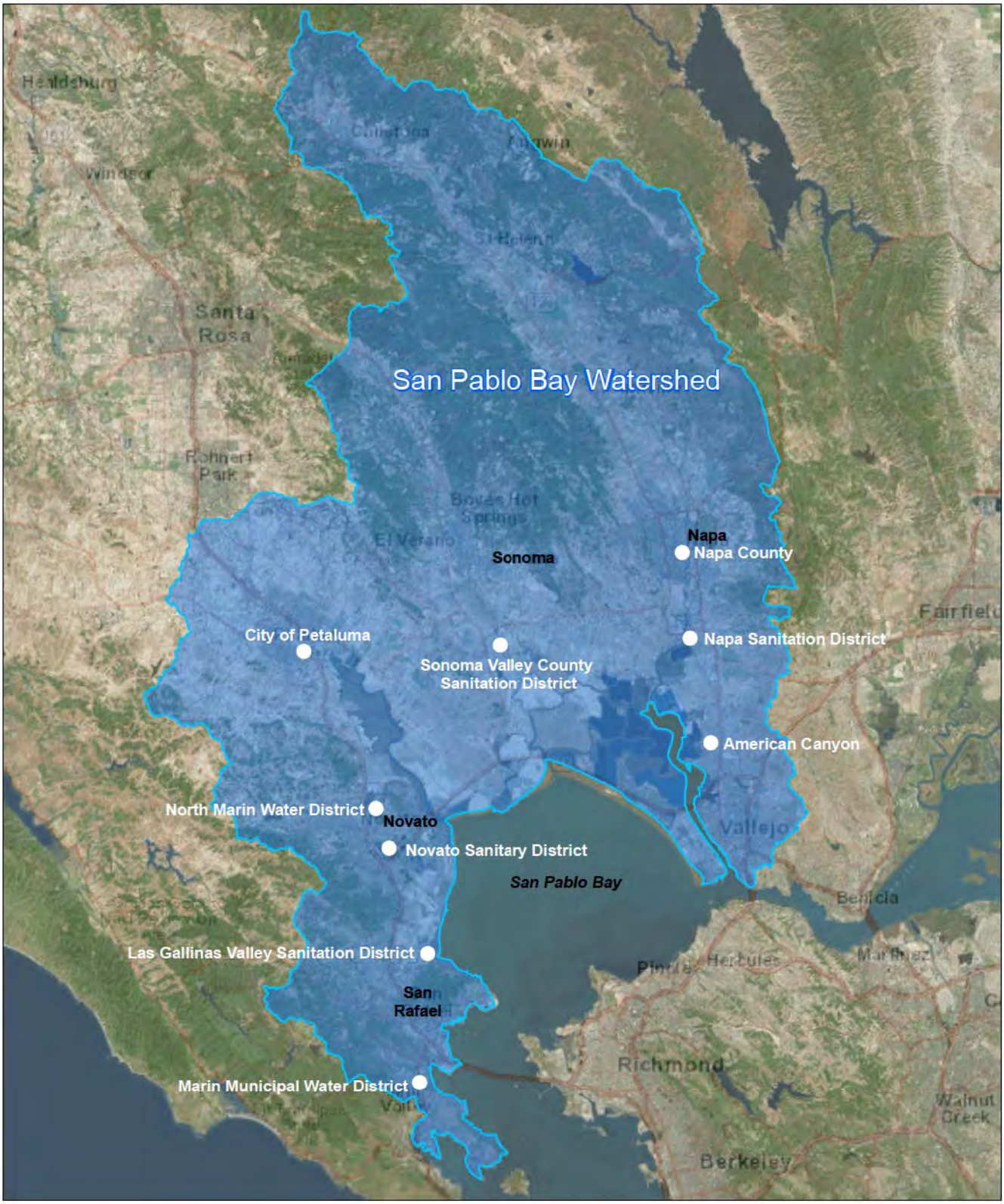
Project Objectives

NBWRA wishes to implement "*A cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water*." The following project objectives have been developed by NBWRA for the North Bay Water Reuse Program and are applicable to the Phase 2 Program. The Program is proposed to promote the expanded beneficial use of recycled water and integrated water management in the North Bay region to:

- Improve local, regional, and State water supply reliability;
- Offset demands on potable water supplies;
- Address impaired groundwater basins;
- Enhance local and regional ecosystems;
- Maintain and protect public health and safety;
- Promote sustainable practices; and
- Implement integrated water management in an economically viable manner.

Program Overview

The Phase 2 Program would be located in the North San Pablo Bay, which lies within the northern portion of the San Francisco Bay estuary in California (**Figure 1**). The project area, illustrated in **Figure 2**, extends approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa counties. The Phase 2 Program project area extends as far south as San Quentin in Marin County, as far north as El Verano in Sonoma County, and includes the cities of Napa and American Canyon in Napa County. This project area encompasses more than 300 square miles. The proposed Projects would include construction and installation of facilities, such as new distribution pipelines to deliver recycled water, pump stations to boost pressure for conveyance, and additional seasonal and operational storage facilities to store recycled water, as well as upgrades to the existing treatment capacities at the existing wastewater treatment plants (WWTPs) in the project area.



SOURCE: North Bay Water Reuse Authority; Calwater 2.2.1

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 1
NBWRP Study Area

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Sonoma County Water Agency

Valley of the Moon ASR (Programmatic)

Sonoma ASR (Programmatic)

City of Petaluma

Urban Recycled Water Expansion

Increase ECWRF Capacity

ECWRF

Agricultural Recycled Water Expansion Phases 1 and 2

Agricultural Recycled Water Expansion Phase 3 (Programmatic)

SVCSD Napa Road Pipeline

SVCSD WRP

Sonoma Valley County Sanitation District

Napa Sanitation District

Napa State Hospital Storage Tank (Programmatic)

Soscol WRF

Soscol WRF Increased Filter Capacity

Additional Soscol WRF Covered Storage

Phase 1 Recycled Water Distribution System Expansion

Phase 2 Recycled Water Distribution System Expansion

American Canyon WRF

American Canyon WRF Phase 2 Treatment Plant Upgrades

City of American Canyon

Option 1: Site near Highway 37 (Tertiary) 150 AF (Programmatic)

Novato SD RWTF

Deer Island WRP

Novato SD RWTF Capacity Expansion

Project - 1 Marin County Lower Novato Creek Project - Distribution

Turnout to Transitional Wetlands

Marin County Lower Novato Creek Project - Restoration (Programmatic)

LGVSD WRP

Novato Sanitary District

Marin Municipal Water District

MMWD Recycled Water Distribution System Expansion to San Quentin State Prison

CMSA WRP

San Pablo Bay

Pacific Ocean

Project Location

Water Recycling Plant

Existing Pipeline

Phase 1 Pipeline

Phase 2 Pipeline

0 5 Miles

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 2

NBWRP Phase 2 Regional Project Map

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Actions to be Considered – Phase 2 Program

As required by CEQA and NEPA, the EIR/EIS will consider the projects proposed under the Phase 2 Program, as well as a number of alternatives – including the No Action Alternative. The Phase 2 Program builds upon the North Bay Water Reuse Program's Phase 1 infrastructure investments, which included $104 million in treatment, distribution, and storage projects to develop recycled water as part of the region's water supply portfolio. Building on Phase 1 technology and infrastructure investments, the Phase 2 Program would deliver increased yield through expanded treatment, new pipelines, and additional storage projects, while building resiliency into the region's long-term water supply through the use of recycled water. In addition to these recycled water projects, Phase 2 also includes conjunctive use projects to promote integrated water management.

NBWRA's member agencies have collectively prioritized the projects within their individual service areas to participate in the Phase 2 Program. These are projects that each member agency has defined to a level of detail that allows for project-level environmental review and will be collectively referred to as the Phase 2 Program. The Phase 2 EIR/EIS will be relied upon by the individual member agencies for approval of each project under the Program. **Table 1** summarizes these projects. Implementation of Phase 2 and a discussion of each project are provided in the following pages.

TABLE 1
IMPLEMENTATION PLAN - PHASE 2 PROGRAM PROJECTS

Agency	Projects	Project Yield (AFY)	Distribution Pipelines (miles)	Pump Stations (hp)	New Storage (AF)	WWTP Treatment Upgrades (mgd)
Novato SD	RWTF Treatment Capacity Expansion	286	--	--	--	0.85
	Marin County Lower Novato Creek Project 1 - Distribution	40	1.1	--	--	--
	Turnout to Wetlands	840	0.02	--	--	--
SVCSD	SVCSD Napa Road Pipeline	200	2.2	--	--	--
MMWD	Recycled Water Distribution System Expansion to San Quentin Prison	153	1.1	50	0.2	0.20
Napa SD	Increase Soscol WRF Filter Capacity	571	--	--	--	1.70
	Soscol WRF Covered Storage	240	0.1	--	10.0	--
Petaluma	Increase ECWRF Capacity	712	--	--	--	2.12
	Urban Recycled Water Expansion	223	8.0	--	--	--
	Agricultural Recycled Water Expansion – Phase 1	813	1.3	--	--	--
	Agricultural Recycled Water Expansion – Phase 2	530	2.1	--	--	--
American Canyon	Recycled Water Distribution System Expansion – Phase 1	102	2.5	--	--	--
	Recycled Water Distribution System Expansion – Phase 2	25	2.0	--	--	--
	WRF Phase 2 Treatment Plant Upgrades	168	0.2	--	--	--
	Total	**4,904**	**20.6**	**50**	**10.2**	**4.87**

NOTES: RWTF = Recycled Water Treatment Facility
WRF = Water Reclamation Facility
ECWRF = Ellis Creek Water Reclamation Facility

SOURCE: Kennedy/Jenks, 2017

Collectively, the Phase 2 Program would provide 4,904 acre-feet (AF) of new recycled water for beneficial use and would include: installation of 20.6 miles of new pipelines, construction of facilities onsite at the existing WWTPs to provide an additional 1.87 million gallons per day (mgd) of tertiary treatment capacity, and development of approximately 10.2 acre-feet of storage, primarily for agricultural use. As with the Phase 1 projects, this replaces drinking water that would no longer be used for non-potable uses, thus ensuring the highest quality water is reserved for potable uses.

Novato Sanitary District

Novato Sanitary District Recycled Water Treatment Facility Capacity Expansion

This project would include facility upgrades at the existing Novato SD Recycled Water Treatment Facility (RWTF) to increase tertiary treatment and disinfection capacity by 0.85 mgd, yielding an additional 286 acre-feet per year (AFY) of recycled water. The existing 1.7 mgd Novato SD RWTF was completed in September 2012 under the Phase 1 Program and currently supplies tertiary recycled water to NMWD. This project would construct additional tertiary filters, associated pipelines and mechanical equipment, and an additional chlorine contact tank within the developed area of the District-owned facility.

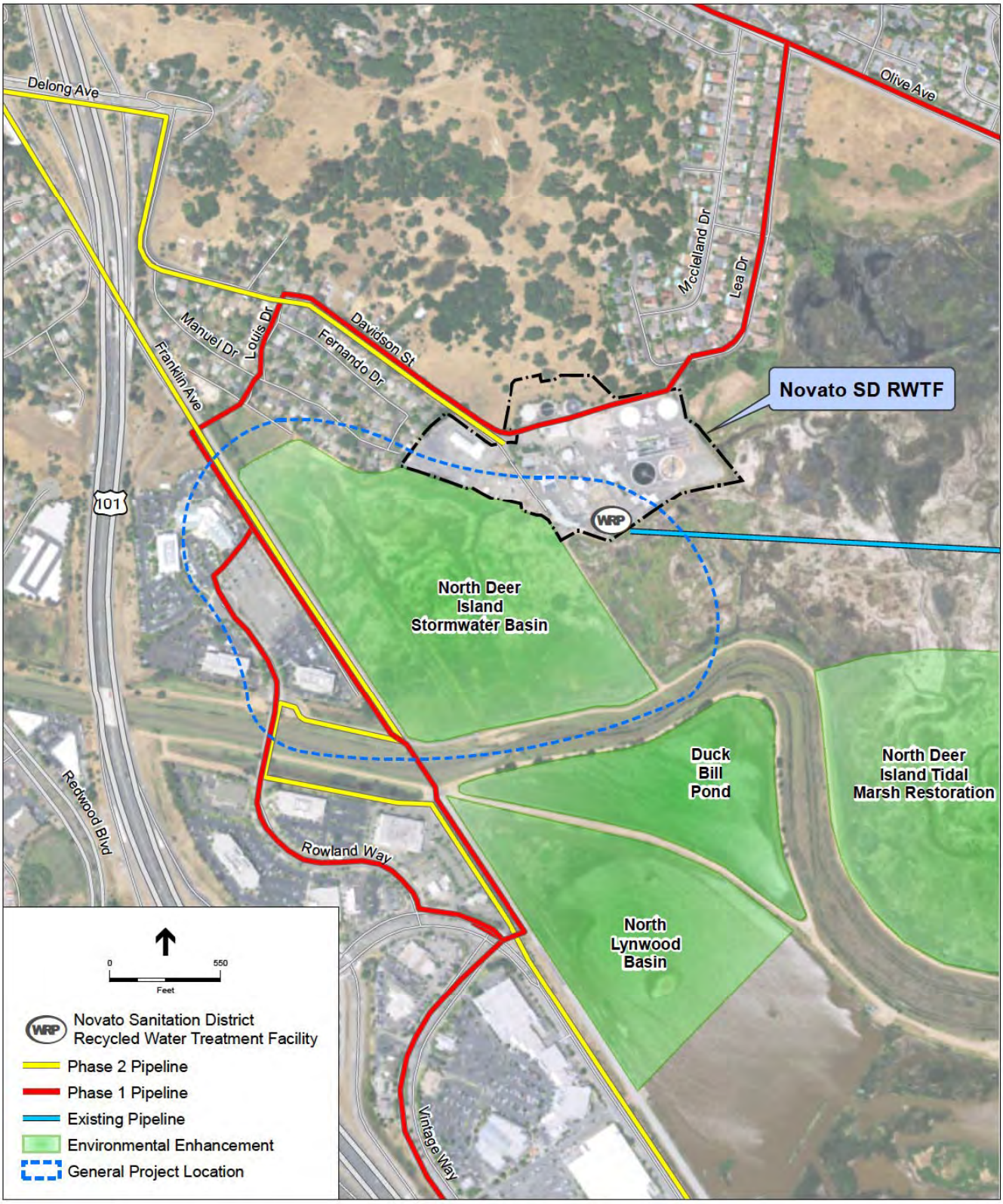
Marin County Lower Novato Creek Project 1 - Distribution

The Novato Watershed Program aims to provide a system-wide analysis of flood protection options and identify specific opportunities to integrate flood protection goals with creek and wetland restoration elements. This process includes evaluating alternatives that would reduce flood protection maintenance costs and impacts and be resilient to sea level rise. The Lower Novato Creek component of the Watershed Program potentially consists of six related projects located downstream of the Sonoma-Marin Area Rail Transit (SMART) bridge to Highway 37 (**Figure 3**). All the facilities are being designed to be adaptive to sea level rise and climate change, and contribute to habitat restoration projects. These projects support shifting use of lands from irrigated hayfields to restored tidal marsh and ecotone levees adaptive to sea level rise. The ability to implement these projects relies on the Novato SD RWTF Capacity Expansion project.

Project 1 of the Lower Novato Creek Watershed Program is the only project included in the Phase 2 Program at Project level for recycled water implementation. The remaining five projects are categorized as Programmatic Level projects and are still under consideration by Marin County. Project 1 would create habitat opportunities and create levees that could utilize recycled water from Novato SD to establish and maintain habitat. Project 1 would construct new eco-tone levees (i.e., levees planted with transitional habitat) to protect adjacent properties, including the newly upgraded treatment plant, will be adaptive to sea level rise, and will provide transitional habitat. The eco-tone levees will be able to accommodate recycled water. The Phase 2 Program project funded by Title XVI and to be analyzed in this EIR/EIS includes the conveyance facilities necessary to deliver recycled water to the levees. This includes 1.1 miles of distribution pipeline to convey recycled water from the RWTF to irrigate the eco-tone levees. The Phase 2 Program distribution project would have a recycled water yield of 40 AFY.

Turnout to Transitional Wetlands (Hamilton-Bel Marin Keys Wetland Restoration Project)

Novato SD worked with Coastal Conservancy to gain approval from the San Francisco Bay Regional Water Quality Control Board (RWQCB) to include provisions in the new National Pollutant Discharge Elimination System (NPDES) permit renewal that would allow a turnout from the existing Novato SD outfall for Coastal Conservancy to use the treated wastewater in the next phase of this restoration project. This project would include connecting to the existing outfall pipeline discharging into San Pablo Bay to divert water and discharge into future transitional brackish wetlands created by the Coastal Conservancy, under the Hamilton-Bel Marin Keys (BMK) Wetland Restoration Project. Both CEQA and NEPA review for



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 3

Project 1 - Marin County Lower Novato Creek Project - Distribution

the larger BMK Wetland Restoration Project were completed in the Bel Marin Keys Unit V Expansion of the Hamilton Wetland Restoration Project Supplemental EIR/EIS and subsequent documentation. Minimal new infrastructure (i.e., a hydraulic structure with 100 feet of pipeline) would be required because the existing outfall pipeline would be utilized to convey recycled water for use to restore fresh and brackish marsh habitat along the newly-constructed shoreline. This project would provide for significant beneficial reuse of 840 AFY of recycled water that would otherwise be discharged to the San Pablo Bay. The project would allow for year-round use of wastewater for a direct environmental benefit.

Sonoma Valley County Sanitation District

SVCSD Napa Road Pipeline Project

The Napa Road Pipeline would expand the recycled water service area in the unincorporated areas of Sonoma County along Napa Road (**Figure 4**). The 2.2-mile pipeline would be located within the roadway or roadway shoulder and would connect to existing pipelines and extend eastward from 5th Street East to serve additional customers. The project would provide up to 200 AFY of recycled water to this area.

Marin Municipal Water District

Recycled Water Distribution System Expansion to San Quentin Prison

A recent Recycled Water Feasibility Study developed for the Central Marin Sanitation Agency (CMSA) and MMWD identified a preferred project to treat effluent from CMSA to California Code of Regulations (CCR) Title 22 standards and deliver it to San Quentin Prison. The project includes additional treatment of 0.2 mgd of secondary effluent at CMSA using microfiltration and chlorine disinfection, then conveying the tertiary-treated recycled water to San Quentin for dual plumbing (121.7 AFY), boiler make-up water (14.3 AFY), landscape irrigation (16.4 AFY), use in a car wash (0.1 AFY), and a truck fill station at CMSA (0.5 AFY) – a total of 153 AFY. The project also includes site retrofits for dual plumbing, connection of the partially dual-plumbed North, South, East and West blocks at San Quentin and an additional 0.2 AF of storage and pumping at CMSA. Approximately 1.1 miles of conveyance pipeline would be installed within Sir Francis Drake Boulevard from the treatment facility to the prison grounds (**Figure 5**).

Napa Sanitation District

Soscol Water Recycling Facility Increased Filter Capacity

The Soscol Water Recycling Facility (WRF) Increased Filter Capacity project would include upgrades at the existing facility to increase tertiary treatment capacity by 1.7 mgd. Filter basins for two filters (comprised of 1,000 square feet of filter area) were constructed as part of the NBWRP Phase 1 Project, but only one filter (500 square feet of filter area) was installed at that time. This Phase 2 Program project consists of installing the remaining filter and associated mechanical components in the existing empty filter basin and would occur within the bounds of the WRF. This would yield an additional 571 AFY of recycled water.

Additional Soscol Water Recycling Facility Covered Storage

The project consists of constructing a 0.25-acre, 10 AF operational storage pond at the Soscol WRF to store tertiary filtered and disinfected recycled water that would be used to meet daily peak customer demands. Similar to the existing recycled water operational storage ponds at the WRF, the new pond would have a lined clay bottom, concrete lined side slopes, and a Hypalon cover. Approximately 600 feet of new pipeline would connect this pond to existing facilities. This project would be located within the bounds of the WRF. This would yield an additional 240 AFY of recycled water.

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 4
SVCSD Napa Road Pipeline

Note: CSMA= Central Marin Sanitation Agency

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 5
Marin Municipal Water District
Recycled Water Distribution
Expansion to San Quentin State Prison

City of Petaluma

Increase Ellis Creek Water Reclamation Facility Capacity

This project would include facility upgrades at the existing Ellis Creek Water Recycling Facility (ECWRF) to increase tertiary filtration and disinfection capacity by 2.12 mgd, providing a yield of 712 AFY. The existing ECWRF is able to treat 6.8 mgd to secondary treatment standards, but only 4.68 mgd to CCR Title 22 tertiary disinfected standards. The existing post-secondary process includes continuous backwash filters and an ultraviolet (UV) disinfection system. The existing UV system was constructed with a third channel not currently in use to allow for future expansion. This project would install five new filter cells that mirror the existing treatment system and would also install banks of UV lamps in the existing, unused channel. These improvements would allow the City of Petaluma to produce additional tertiary treated recycled water to meet increasing recycled water demands.

Urban Recycled Water Expansion

The Urban Recycled Water Expansion project would construct approximately 8.0 miles of recycled water pipelines throughout the eastern portion of the city extending from the end of the existing 20-inch-diameter pipeline that originates from the ECWRF to serve existing landscape customers currently served by the City of Petaluma's potable water system (**Figure 6**). The project would also extend a pipeline from the existing 8-inch-diameter pipeline near ECWRF to serve the Oakmead Business Park. The total project yield is about 223 AFY. The proposed pipeline alignments are along existing roadways within the city's right-of-way. The number of creek crossings would be minimized and green ways avoided to minimize construction disturbance.

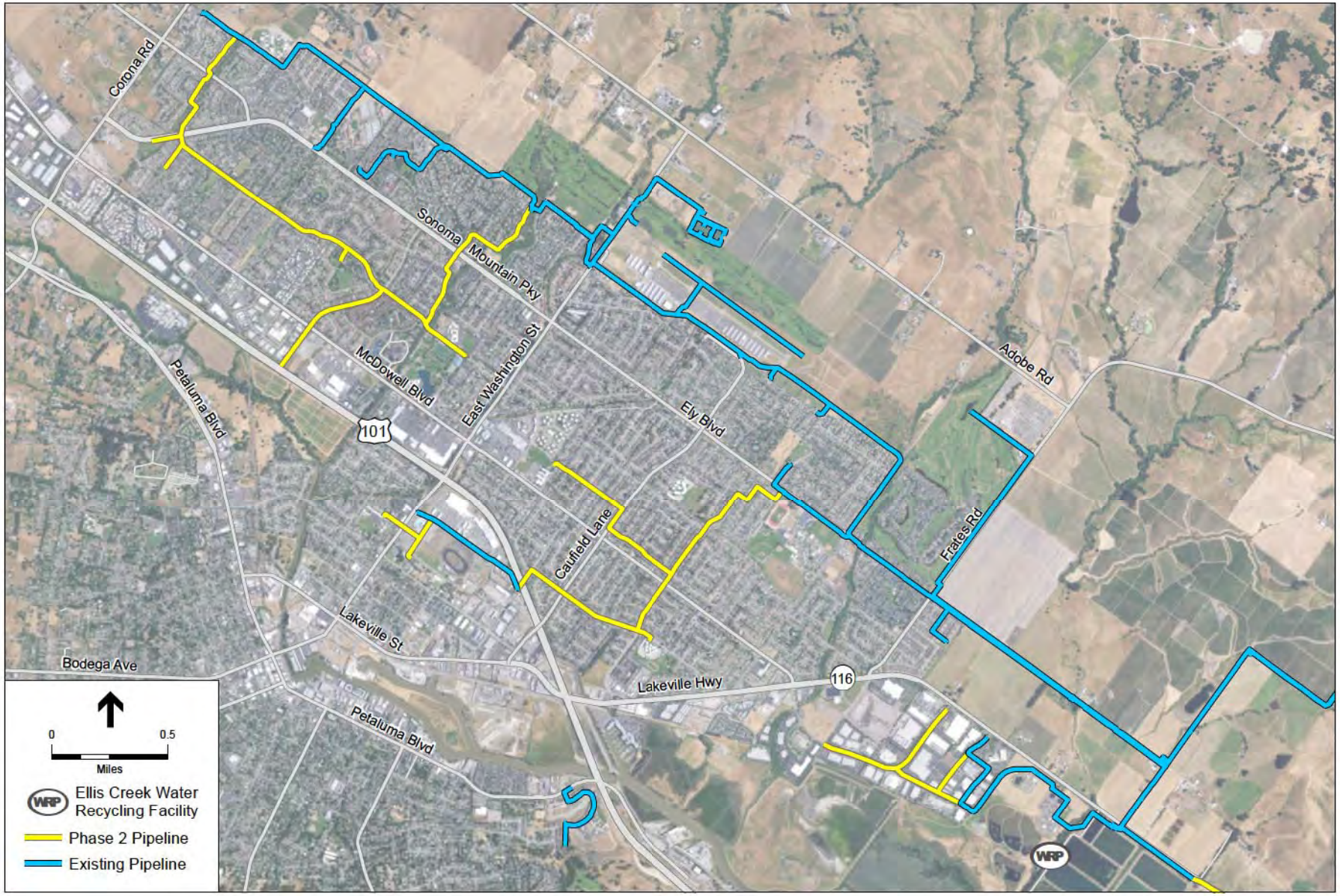
Agricultural Recycled Water Expansion

The City of Petaluma's Agricultural Recycled Water Expansion program would extend recycled water pipelines from the ECWRF eastward to serve agricultural customers along Lakeville Highway (**Figure 7**). The expansion is divided into three phases, the first two being Title XVI projects and the third a programmatic-level project (as explained below). The first phase would extend approximately 1.3 miles of pipeline from the ECWRF to Stage Gulch Road and supply 813 AFY. The second phase would extend approximately 2.1 miles of pipelines from Stage Gulch Road to Cannon Road to supply 530 AFY of recycled water. The distribution pipeline along Lakeville Highway for these phases would be sized to meet future demands for the third phase (to be reviewed at a program level). The pipelines would be located within roadways or roadway shoulders in public right-of-right. The number of creek crossings would be minimized and green ways avoided to minimize construction disturbance.

City of American Canyon

Phase 1 Recycled Water Distribution System Expansion

A 2016 comprehensive Recycled Water Master Plan developed for the City of American Canyon identified several pipeline extensions of the existing system to deliver recycled water to existing landscaping and industrial users on potable water and convert them to recycled water for non–potable uses. The customer demands associated with these extensions would be met directly from the WRF during the peak month. No seasonal storage would be needed. Phase 1 expansion includes six recycled water pipeline extensions, totaling 2.5 miles, located within existing public roadways in the northern and western portions of the city (**Figure 8**), yielding 102 AFY of tertiary-treated recycled water.



SOURCE: North Bay Water Reuse Authority

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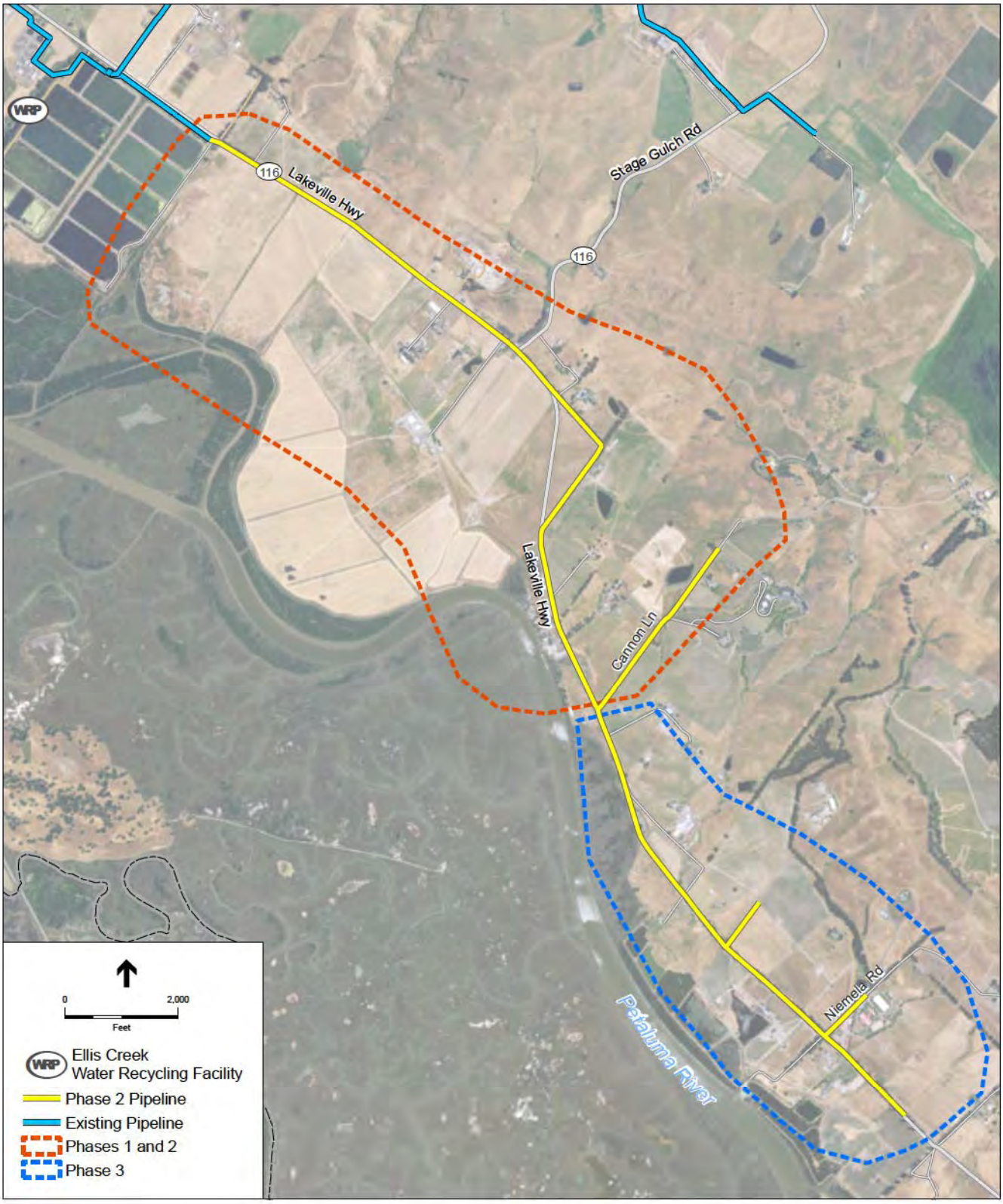
Figure 6
City of Petaluma
Urban Recycled Water Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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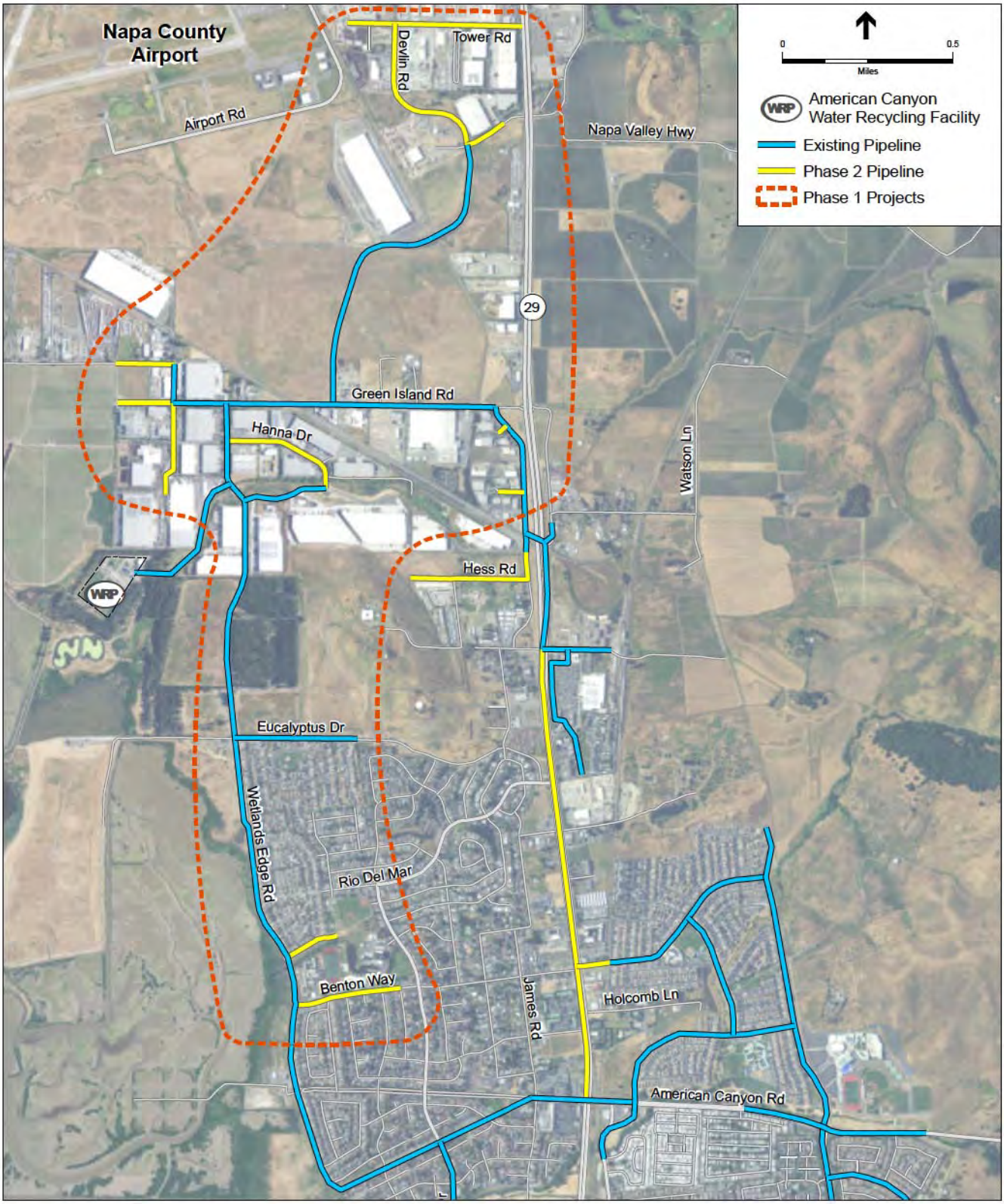
Figure 7
City of Petaluma
Agricultural Recycled Water Expansion
Phases 1, 2, and 3



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 8
City of American Canyon
Phase 1 Recycled Water Distribution System Expansion

Phase 2 Recycled Water Distribution System Expansion

Like Phase 1, this project includes additional pipeline extensions from the existing recycled water system, as identified in the City of American Canyon's 2016 Recycled Water Master Plan. Phase 2 would deliver a yield of 25 AFY recycled water to and convert existing landscaping and industrial users from potable water to recycled water for non-potable uses. The customer demands associated with these extensions would be met directly from the WRF during the peak month. No seasonal storage would be needed. These pipelines would be implemented after the Phase 2 Treatment Plant Upgrades described below are completed. The Phase 2 expansion project includes three recycled water pipeline extensions, totaling 2.0 miles, located within existing built roadways (**Figure 9**).

American Canyon WRF Phase 2 Treatment Plant Upgrades

This project would include facility upgrades at the existing American Canyon WRF to increase tertiary treatment process to improve water quality for existing and future recycled water users. The existing American Canyon WRF consists of a membrane bioreactor (MBR) that could produce 3.75 mgd of tertiary recycled water for non-potable reuse in the City's service area. This project would construct a two-stage reverse osmosis (RO) system, modify existing ponds for concentrate disposal, and install new pipelines to connect the existing MBR system to the RO system and from the RO system to the modified ponds for concentrate disposal, all within the developed area of the WRF. The proposed upgrades would greatly benefit existing and new recycled water customers by reducing the concentration of total dissolved solids (TDS) in the effluent and providing the necessary facilities for concentrate disposal through modified evaporation ponds.

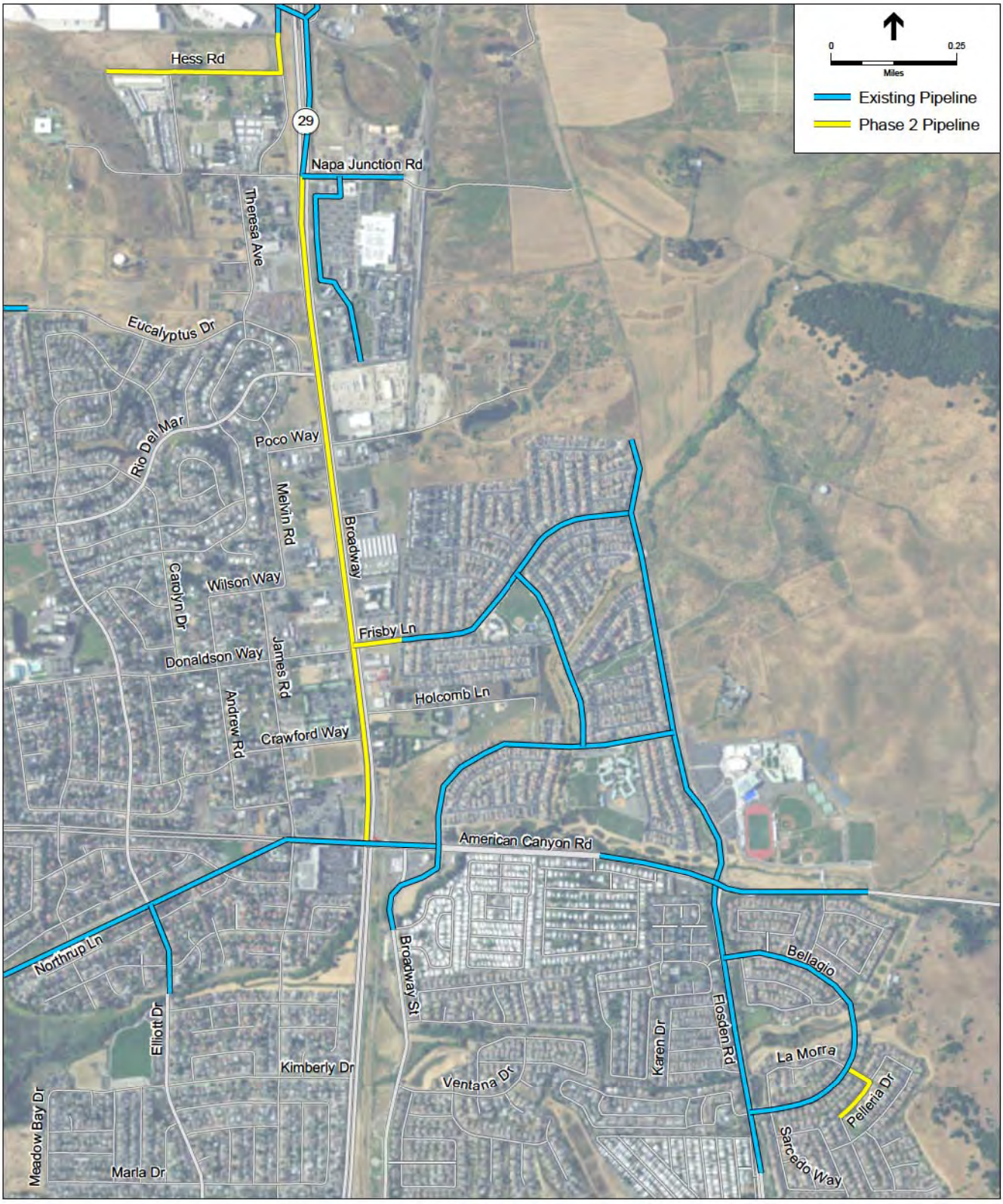
Programmatic Level

The programmatic level evaluation will include six projects, listed below in **Table 2** and shown on **Figure 10**. These projects are not proposed for implementation under the Phase 2 Program, but are included in the EIR/EIS at a programmatic level. While active projects for the respective member agency, they are currently at a conceptual level and would be implemented as additional design and funding become available. These projects will be examined at a program level to allow for future funding opportunities.

TABLE 2
PHASE 2 PROGRAMMATIC PROJECTS

Agency	Project Type	Project Name
Novato SD	Seasonal Storage	Option 1: Site Near Highway 37 (Tertiary) 150 AF
	Environmental Enhancement	Marin County Lower Novato Creek Project - Restoration
City of Petaluma	Distribution	Agricultural Recycled Water Expansion Phase 3
Napa SD	Operational Storage	Napa State Hospital Storage Tank
Water Agency	Potable Water ASR	Valley of the Moon ASR
	Potable Water ASR	Sonoma ASR

NOTES: ASR = Aquifer Storage and Recovery



SOURCE: North Bay Water Reuse Authority

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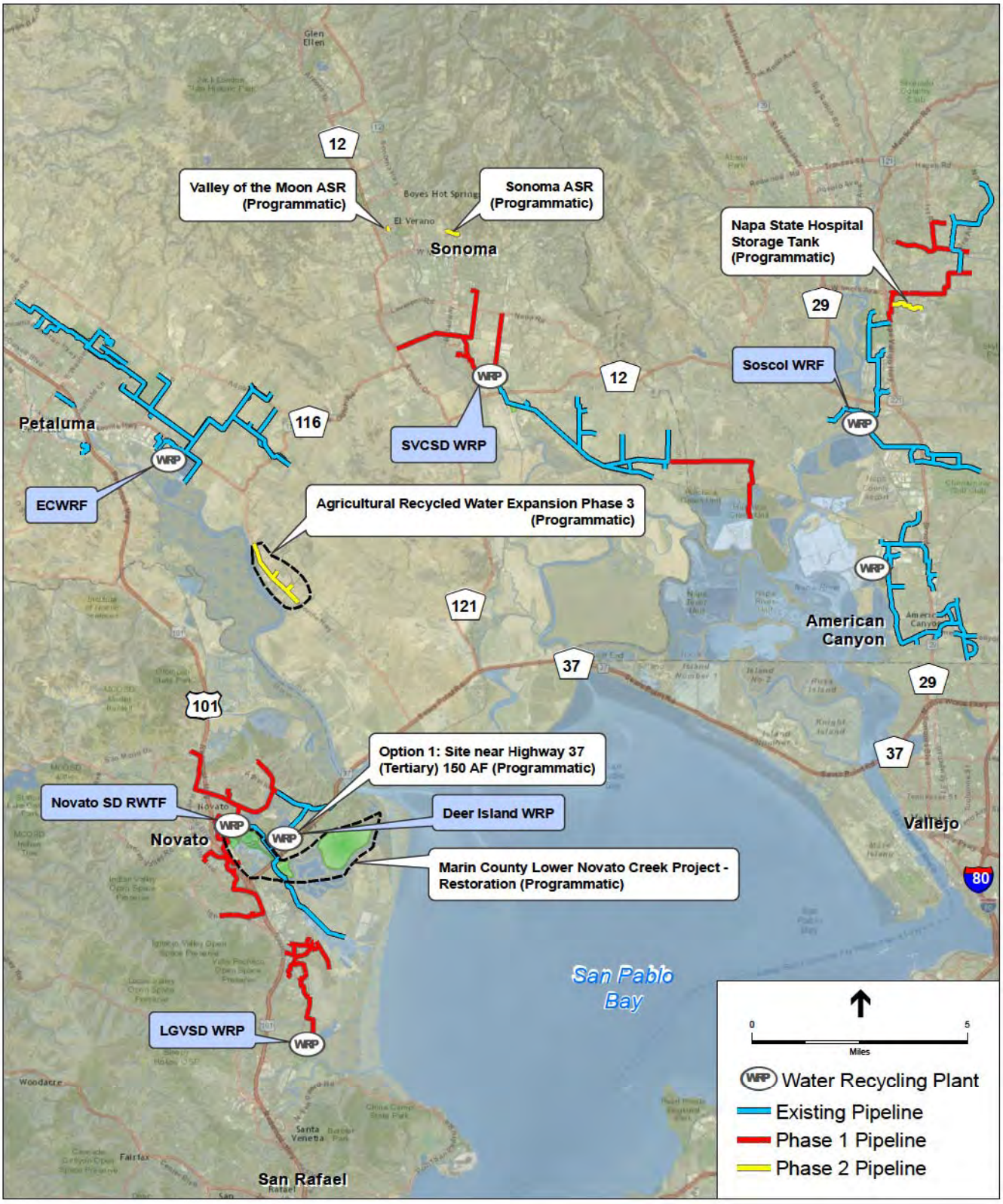
Figure 9
City of American Canyon
Phase 2 Recycled Water Distribution System Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
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Figure 10
NBWRP Programmatic Level Projects

Issues to Be Addressed in the EIR

The EIR/EIS will address the potential environmental impacts associated with the proposed Project. Specific areas of analysis will include: Aesthetics, Agriculture Resources, Air Quality, Biological Resources, Cultural Resources, Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Population and Housing, Public Services, Recreation, Transportation and Traffic, Tribal Cultural Resources, Utilities and Public Services, Socioeconomics, and Environmental Justice. Areas of analysis may be changed based on input received during the NOP review period. Where feasible, mitigation measures will be proposed to avoid or reduce such impacts. As required by CEQA and NEPA, the environmental analysis will consider the projects proposed under the Phase 2 Program, as well as a number of feasible alternatives – including the No Action Alternative. Additionally, potential cumulative impacts of the Project will be addressed in the EIR/EIS.

Information to be included in the EIR/EIS will also be based on input and comments received during this NOP review period. Decision-makers, responsible and trustee agencies under CEQA, property owners, and interested persons and parties will also have an opportunity to comment on the Draft EIR/EIS after it is published and circulated for public review.

Public Comment Period for this Notice of Preparation

Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice. The public comment period will close at **5:00 p.m.** on **August 21, 2017**. Please include a name, address, email address, and telephone number of a contact person in your agency for all future correspondence on this subject. Please send your comments to:

Sonoma County Water Agency

Anne Crealock
404 Aviation Blvd.
Santa Rosa, CA 95403

You may also submit your comments electronically at the following website:

www.nbwra.org

Or via e-mail to:

Phase2EIR@nbwra.org

Before including your name, address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time.

Scoping Meetings

In order for the public and regulatory agencies to have an opportunity to ask questions and submit comments on the scope of the EIR/EIS, a series of scoping meetings will be held within Marin, Sonoma, and Napa counties during the NOP review period. The scoping meetings will be held on the following dates:

August 2, 2017 (Wednesday)
6:30 PM – 8:00 PM
San Rafael Community Center Auditorium
618 B Street, San Rafael

August 3, 2017 (Thursday)
6:30 PM – 8:00 PM
American Canyon City Hall (Council Chambers)
4381 Broadway, Suite 201, American Canyon

August 9, 2017 (Wednesday)
6:30 PM – 8:00 PM
Petaluma Community Center, Meeting Room A-D
320 North McDowell Boulevard, Petaluma

August 10, 2017 (Thursday)
6:30 PM – 8:00 PM
Sonoma Community Center, Room 110
276 East Napa Street, Sonoma

If you have a disability which requires an accommodation, an alternative format, or requires another person to assist you while attending these meetings or reviewing associated materials, please contact the Sonoma County Water Agency at 707-524-8378, as soon as possible to ensure arrangements for accommodation.

Documents or files related to the proposed project are available for review at www.nbwra.org and the member agency offices; they can be also made available by emailing Phase2EIR@nbwra.org. If you have any questions, or if you wish to update your information on our mailing list, please call Ms. Anne Crealock of the Water Agency at (707) 547-1948.

NORTH BAY WATER REUSE PROGRAM

Water Supply Reliability through Regional Reuse

Member Agencies

- City of American Canyon
- Las Gallinas Valley Sanitary District
- Marin County
- Marin Municipal Water District
- Napa County
- Napa Sanitation District
- North Marin Water District
- Novato Sanitary District
- City of Petaluma
- Sonoma County Water Agency
- Sonoma Valley County Sanitation District

Para ver esta información en español, por favor visite al

www.nbrwa.org

Notice of Preparation Availability

North Bay Water Reuse Authority to Host Public Meetings in Preparation for Proposed Recycled Water Projects

NORTH BAY WATER REUSE PROGRAM

404 Aviation Blvd., Santa Rosa, CA 95403

The North Bay Water Reuse Authority (NBWRA) is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water. The NBWRA is proposing Phase 2 of the North Bay Water Reuse Program to continue increasing the beneficial use of recycled water. Sonoma County Water Agency (Water Agency) will act as Lead Agency under the California Environmental Quality Act (CEQA) for preparing an Environmental Impact Report (EIR). The Department of Interior, Bureau of Reclamation, will be the federal Lead Agency under the National Environmental Policy Act (NEPA) for preparing an Environmental Impact Statement (EIS).

Consistent with Section 15082 of the CEQA Guidelines, a Notice of Preparation (NOP) has been prepared describing the proposed project and identifies issue areas to be examined in the EIR/EIS. Agencies and interested members of the public are invited to provide input on the scope of the environmental analysis. In keeping with Water Agency's Sustainability Program, the NOP is available to the public on the web page identified below. Printed copies of the NOP are available at each of the member agency offices or are available upon request by emailing Phase2EIR@nbwra.org.

Public Scoping Meetings will be held in American Canyon, Petaluma, San Rafael, and Sonoma. (The same content will be presented at each meeting.) For more information and to find the location and date of the meeting in your area, visit **www.nbwra.org**. If you have a disability, which requires an accommodation, an alternative format, or requires another person to assist you while attending these meetings or reviewing associated materials, contact the Water Agency at 707-524-8378, as soon as possible to ensure arrangements for accommodation.

The projects proposed in the Phase 2 Program would continue to build upon commitments to long-term inter-agency cooperation to address common needs related to reliable water supplies and enhanced environmental restoration. These projects would include construction and operation of treatment capacity improvements, distribution facilities, and storage facilities (seasonal and operational) to provide recycled water environmental, agricultural, and municipal reuse in the North San Pablo Bay region, which encompasses approximately 318 square miles in Marin, Sonoma and Napa counties. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing wastewater treatment plants. This recycled water would be used in a manner consistent with the California Code of Regulations, Title 22, pertaining to the use of tertiary-treated recycled water.

The public comment period will close at 5:00 PM on August 21, 2017. Before including your name, address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time.

Please include a name, address, and telephone number of a contact person in your agency for all future correspondence on this subject. Please send your comments to:

Anne Crealock
Sonoma County Water Agency
404 Airport Boulevard
Santa Rosa, CA 95403

APPENDIX B

NOP Distribution/Mailing Lists

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Holley	Jason	City of American Canyon, Director of Public Works	4381 Broadway Street, Suite 201	American Car	CA	94503	1	
Cooper	Brent	City of American Canyon, Director of Community Development	4381 Broadway Street, Suite 201	American Car	CA	94503	1	
Shigley	Dana	City of American Canyon, City Manager	4381 Broadway Street, Suite 201	American Car	CA	94503	1	
Garcia	Leon	City of American Canyon, Mayor	4381 Broadway Street, Suite 201	American Car	CA	94503	1	
Weeks	Glen E.	City of American Canyon, Fire Department	911 Donaldson Way East	American Car	CA	94503	1	
Skinner	Julian	City of Larkspur, Director of Public Works/Engineering	400 Magnolia Avenue	Larkspur	CA	94939	1	
Toft	Neal	City of Larkspur, Director of Planning	400 Magnolia Avenue	Larkspur	CA	94939	1	
Schwarz	Dan	City of Larkspur, City Manager	400 Magnolia Avenue	Larkspur	CA	94939	1	
Haroff	Kevin	City of Larkspur, Mayor	400 Magnolia Avenue	Larkspur	CA	94939	1	
Shurtz	Scott	Larkspur Fire Department	420 Magnolia Avenue	Larkspur	CA	94939	1	
LaRochelle	Jack	City of Napa, Director of Public Works	PO Box 660	Napa	CA	94574	1	
Tooker	Rick	City of Napa, Director of Community Development	PO Box 660	Napa	CA	94574	1	
Parness	Mike	City of Napa, City Manager	PO Box 660	Napa	CA	94559	1	
Techel	Jill	City of Napa, Mayor	PO Box 660	Napa	CA	94559-0660	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Randolph	Mike	Napa Fire Department	PO Box 660	Napa	CA	94559-0660	1	
Young	Glenn	City of Novato, Director of Public Works	75 Rowland Way, #200	Novato	CA	94945	1	
Brown	Robert M.	City of Novato, Director of Community Development	922 Machin Avenue	Novato	CA	94945	1	
Candelario	Regan M.	City of Novato, City Manager	922 Machin Avenue	Novato	CA	94945	1	
Athas	Denise	City of Novato, Mayor	922 Machin Avenue	Novato	CA	94945	1	
Marengo	Vincent	City of Petaluma, Director of Public Works & Utilities	11 English Street	Petaluma	CA	94952	1	
Moore	Mike	City of Petaluma, Director of Economic Development	11 English Street	Petaluma	CA	94952	1	
Brown	John C.	City of Petaluma, City Manager	11 English Street	Petaluma	CA	94952	1	
Glass	David	City of Petaluma, Mayor	11 English Street	Petaluma	CA	94952	1	
Thompson	Leonard	Petaluma Fire Department	11 English Street	Petaluma	CA	94952	1	
Cooper	Claire	Petaluma Parks & Recreation Commission	320 N. McDowell Blvd.	Petaluma	CA	94954	1	
Guerin	Bill	City of San Rafael, Director of Public Works	111 Morphew Street	San Rafael	CA	94901	1	
Jensen	Paul	City of San Rafael, Director of Community Development	1400 Fifth Avenue	San Rafael	CA	94901	1	
Schutz	Jim	City of San Rafael City Manager	1400 Fifth Avenue, Room 203	San Rafael	CA	94901	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Phillips	Gary	City of San Rafael, Mayor	1400 Fifth Avenue, Room 203	San Rafael	CA	94901	1	
Gray	Christophe	San Rafael Fire Department	1600 Los Gamos Drive, Suite 345	San Rafael	CA	94903	1	
Ferguson	Colleen	City of Sonoma, Director of Public Works	#1 The Plaza	Sonoma	CA	95476	1	
Goodison	David	City of Sonoma, Director of Planning	#1 The Plaza	Sonoma	CA	95476	1	
Capriola	Cathy	City of Sonoma, City Manager	#1 The Plaza	Sonoma	CA	95476	1	
Hundley	Rachel	City of Sonoma, Mayor	#1 The Plaza	Sonoma	CA	95476	1	
Kirn	Mike	City of Calistoga, Director of Public Works	414 Washington Street	Calistoga	CA	94515		1
Goldberg	Lynn	City of Calistoga, Director of Planning	1232 Washington Street	Calistoga	CA	94515		1
Feik	Dylan	City of Calistoga, City Manager	1232 Washington Street	Calistoga	CA	94515		1
Canning	Chris	City of Calistoga, Mayor	1232 Washington Street	Calistoga	CA	94515		1
Rincon	M	City of Cloverdale, Director of Public Works	700 Asti Road	Cloverdale	CA	95425		1
Kelley	David	City of Cloverdale, Director of Community Development	124 N. Cloverdale Blvd.	Cloverdale	CA	95425		1
Cayler	Paul	City of Cloverdale, City Manager	124 N. Cloverdale Blvd.	Cloverdale	CA	95425		1
Cox	Robert	City of Cloverdale, Mayor	124 N. Cloverdale Blvd.	Cloverdale	CA	95425		1

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Bracken	David	City of Corte Madera, Director of Public Works	300 Tamalpais Drive	Corte Madera	CA	94925	1	
Wolff	Adam	City of Corte Madera, Director of Planning	300 Tamalpais Drive	Corte Madera	CA	94925	1	
Cusimano	Todd	City of Corte Madera, Town Manager	300 Tamalpais Drive	Corte Madera	CA	94925	1	
Furst	Diane	City of Corte Madera, Mayor	300 Tamalpais Drive	Corte Madera	CA	94925	1	
Scott	Craig	City of Cotati, Director of Public Works	201 West Sierra Avenue	Cotati	CA	94931	1	
Parker	Vicki	City of Cotati, Director of Community Development	201 West Sierra Avenue	Cotati	CA	94931	1	
O'Bid	Damian	City of Cotati, City Manager	201 West Sierra Avenue	Cotati	CA	94931	1	
Harvey	Susan	City of Cotati, Mayor	201 West Sierra Avenue	Cotati	CA	94931	1	
Salmi	Brent	City of Healdsburg, Director of Public Works	401 Grove Street	Healdsburg	CA	95448		1
DeRosa	Maya	City of Healdsburg, Director of Planning & Building	401 Grove Street	Healdsburg	CA	95448		1
Mickaelian	David	City of Healdsburg, City Manager	401 Grove Street	Healdsburg	CA	95448		1
McCaffrey	Shaun	City of Healdsburg, Mayor	401 Grove Street	Healdsburg	CA	95448		1
McArthur	John	City of Rohnert Park, Director of Public Works	600 Enterprise Drive	Rohnert Park	CA	94928	1	
Pawson	Mary Grac	City of Rohnert Park, Director of Community Development- Planning	130 Avram Avenue	Rohnert Park	CA	94928	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Jenkins	Darrin	City of Rohnert Park, City Manager	130 Avram Avenue	Rohnert Park	CA	94928	1	
MacKenzie	Jake	City of Rohnert Park, Mayor	130 Avram Avenue	Rohnert Park	CA	94928	1	
Ahmann Smithies	Erica	City of St. Helena, Director- Public Works	1480 Main Street	St. Helena	CA	94574		1
Housh	Noah	City of St. Helena, Community Development-Planning	1480 Main Street	St. Helena	CA	94574		1
Ahmann Smithies	Erica	City of St. Helena, Interim City Manager	1480 Main Street	St. Helena	CA	94574		1
Galbraith	Alan	City of St. Helena, Mayor	1480 Main Street	St. Helena	CA	94574		1
Nutt	Jason	City of Santa Rosa, Director of Public Works	69 Stony Circle	Santa Rosa	CA	95404	1	
Horenstein	Bennett	City of Santa Rosa, Director of SR Water	69 Stony Circle	Santa Rosa	CA	95401	1	
Guhin	David	City of Santa Rosa, Director of Planning & Economic Development	100 Santa Rosa Avenue	Santa Rosa	CA	95401	1	
McGlynn	Sean	City of Santa Rosa, City Manager	100 Santa Rosa Avenue	Santa Rosa	CA	95401	1	
Coursey	Chris	City of Santa Rosa, Mayor	100 Santa Rosa Avenue	Santa Rosa	CA	95401	1	
Barnes	Patrick	Town of Tiburon, Director of Public Works & Engineering	1505 Tiburon Blvd.	Tiburon	CA	94920		1
Kerslake	Liz	Town of Tiburon, Community Development	1505 Tiburon Blvd.	Tiburon	CA	94920		1

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Pickett	Patti	Town of Tiburon, Administrative Services	1505 Tiburon Blvd.	Tiburon	CA	94920		1
Fraser	Jim	Town of Tiburon, Mayor	1505 Tiburon Blvd.	Tiburon	CA	94920		1
Bertolero	Toni	Town of Windsor, Director of Public Works	8400 Windsor Road, Bldg. 100	Windsor	CA	95492		1
McNabb	Kenneth	Town of Windsor, Director of Planning	9291 Old Redwood Hwy.	Windsor	CA	95492		1
Kelly	Linda	Town of Windsor, City Manager	9291 Old Redwood Hwy., Ste. 400	Windsor	CA	95492		1
Fudge	Debora	Town of Windsor, Mayor	9291 Old Redwood Hwy.	Windsor	CA	95492		1
Tagliaboschi	Joe	Town of Yountville, Director of Public Works	6550 Yount Street	Yountville	CA	94599		1
Liston	Sandra	Town of Yountville, Director of Planning	6550 Yount Street	Yountville	CA	94599		1
Rogers	Steven	Town of Yountville, City Manager	6550 Yount Street	Yountville	CA	94599		1
Dunbar	John	Town of Yountville, Mayor	6550 Yount Street	Yountville	CA	94599		1
Rojas	Raul	Marin County, Director of Public Works	3501 Civic Center Drive, Ste. 304	San Rafael	CA	94903	1	
Reid	Rachel	County of Marin, Community Development Agency	3501 Civic Center Dr. , Ste. 308	San Rafael	CA	94903	1	
Benson	Richard	Marin County Clerk	3501 Civic Center Drive , Ste. 208	San Rafael	CA	94903	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Connolly	Damon	Marin County Board of Supervisors, District 1	3501 Civic Center Drive , Room 329	San Rafael	CA	94903	1	
Rice	Katie	Marin County Board of Supervisors, District 2	3501 Civic Center Drive , Room 329	San Rafael	CA	94903	1	
Sears	Kathrin	Marin County Board of Supervisors, District 3	3501 Civic Center Drive , Room 329	San Rafael	CA	94903	1	
Rodoni	Dennis	Marin County Board of Supervisors, District 4	3501 Civic Center Drive , Room 329	San Rafael	CA	94903	1	
Arnold	Judy	Marin County Board of Supervisors, District 5	3501 Civic Center Drive , Room 329	San Rafael	CA	94903	1	
Weber	Jason	Marin County Fire Department	33 Castle Rock Road	Woodacre	CA	94973	1	
Riesenberg	Felix	County of Napa	1195 3rd Street Room 201	Napa	CA	94559	1	
Lederer	Steven	County of Napa, Director of Public Works	1195 3rd Street, Ste. 101	Napa	CA	94559	1	
Morrsion	David	County of Napa, Director of Planning, Building, & Environmental Services	1195 3rd Street, 2nd Floor	Napa	CA	94559	1	
Tuteur	John	Napa County Recorder-Clerk	PO Box 298	Napa	CA	94559-0228	1	
Wagenknecht	Brad	Napa County Board of Supervisors, District 1	1195 Third Street, Suite 310	Napa	CA	94559	1	
Gregory	Ryan	Napa County Board of Supervisors, District 2	1195 Third Street, Suite 310	Napa	CA	94559	1	
Dillon	Diane	Napa County Board of Supervisors, District 3	1195 Third Street, Suite 310	Napa	CA	94559	1	
Pedroza	Alfredo	Napa County Board of Supervisors, District 4	1195 Third Street, Suite 310	Napa	CA	94559	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Ramos	Belia	Napa County Board of Supervisors, District 5	1195 Third Street, Suite 310	Napa	CA	94559	1	
Biermann	Barry	Napa County Fire Department	1125 Third St., 2nd Floor	Napa	CA	94558	1	
Pehl	Martin	Napa County Airport	2030 Airport Road	Napa	CA	94558	1	
Klasson	Susan	Sonoma County, Director of Transportation & PublicWorks	2300 County Center Drive, Ste. B100	Santa Rosa	CA	95403	1	
Robertson	David	Sonoma County Transportation & Public Works	2300 County Center Drive, Ste. B100	Santa Rosa	CA	95403	1	
Knight	David	Sonoma County Transportation & Public Works	2300 County Center Drive, Ste. B100	Santa Rosa	CA	95403	1	
Wick	Tennis	Sonoma County Permit & Resoure Management Department	2550 Ventura Avenue	Santa Rosa	CA	95403	1	
Barrett	Jennifer	Sonoma County Permit & Resoure Management Department	2550 Ventura Avenue	Santa Rosa	CA	95403	1	
Rousseau	Willaim	Sonoma County Clerk-Recorder	585 Fiscal Drivee, Room 103	Santa Rosa	CA	95403	1	
Goldstein	Bruce	Sonoma County Counsel	575 Adminstration Crive, Room 105-A	Santa Rosa	CA	95403	1	
Gorin	Susan	Sonoma County Board of Supervisors, District 1	575 Adminsitrative Drive, Room 100A	Santa Rosa	CA	95403	1	
Rabbitt	David	Sonoma County Board of Supervisors, District 2	575 Adminsitrative Drive, Room 100A	Santa Rosa	CA	95403	1	
Zane	Shirley	Sonoma County Board of Supervisors, District 3	575 Adminsitrative Drive, Room 100A	Santa Rosa	CA	95403	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Gore	James	Sonoma County Board of Supervisors, District 4	575 Adminsitrative Drive, Room 100A	Santa Rosa	CA	95403	1	
Hopkins	Lynda	Sonoma County Board of Supervisors, District 5	575 Adminsitrative Drive, Room 100A	Santa Rosa	CA	95403	1	
Sosko	Christine	Sonoma County Dept of Health Services	3313 Chanate Road	Santa Rosa	CA	95404	1	
Smith	Philip	Marin Sonoma Mosquito & Vector Control Agency	595 Helman Lane	Cotati	CA	94931		1
Whitaker	Bert	Sonoma County Regional Parks	2300 County Center Drive, Suite 120A	Santa Rosa	CA	95403	1	
Crealock	Anne	Sonoma County Water Agency	404 Aviation Blvd	Santa Rosa	CA	95403	10	
Terrell	Al	Sonoma County Fire & Emergency Services	2300 County Center Drive, Suite 220B	Santa Rosa	CA	95403	1	
Correia	Lisa	Sonoma County Agriculture Commission	133 Aviation Blvd, Suite 110	Santa Rosa	CA	95403	1	
Grossi	Dominic	Marin County Farm Bureau	P.O. Box 219	Point Reyes S	CA	94956	1	
Ramer	Jesse	Napa County Farm Bureau	811 Jefferson Street	Napa	CA	94559	1	
Vail	Kim	Sonoma County Farm Bureau	3589 Westwind Blvd.	Santa Rosa	CA	95403	1	
		Marin County Free Library	3501 Civic Center Drive, Suite 414	San Rafael	CA	94903	1	
		Novato Public Library	1720 Novato Blvd.	Novato	CA	94947	1	
		South Novato Public Librar	931 C St.	Novato	CA	94949	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
		San Rafael Public Library	1100 E Street	San Rafael	CA	94901	1	
		San Rafael Public Library, Pickleweed Branch	50 Canal Street	San Rafael	CA	94901	1	
Kreimeier	Danis	Napa County Library	580 Coombs Street	Napa	CA	94559	1	
		American Canyon Library	300 Crawford Way	American Car	CA	94503	1	
		Petaluma Regional Library	100 Fairgrounds Dr.	Petaluma	CA	94952	1	
		Sonoma Valley Regional Library	755 West Napa Street	Sonoma	CA	95476	1	
						TOTAL	**109**	**29**
							NOP Doc	**NOP Card**

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Weeks	Glen	American Canyon Fire District	911 Donaldson Way East	American Can	CA	94503	1	
Heine	Mark	Novato Fire Protection District	95 Rowland Way	Novato	CA	94945	1	
Akre	Steve	Sonoma Valley Fire & Rescue Authority	630 2nd St. West	Sonoma	CA	95476	1	
		Rancho Adobe Fire District	11000 Main Street	Penngrove	CA	94951	1	
		Congress Valley Water Distict	1340 Clay Street	Napa	CA	94559		1
Stewart	John	Las Carneros Water District	2111 Las Amigas Road	Napa	CA	94559		1
Kumar	Krishna	Marin Municipal Water District, General Manager	220 Nellen Avenue	Corte Madera	CA	94925	1	
Anderson	Dain	Marin Municipal Water District, Environmental Coordinator	220 Nellen Avenue	Corte Madera	CA	94925	1	
McIntyre	Drew	North Marin Water District, General Manager	999 Rush Creek Place	Novato	CA	94945	1	
Volger	Rocky	North Marin Water District, Chief Engineer	999 Rush Creek Place	Novato	CA	94945	1	
Meulrath	Daniel	Valley of the Moon Water District	P.O. Box 280	El Verano	CA	95433	1	
Dow	Jason	Central Marin Sanitary Agency	1301 Andersen Dr.	San Rafael	CA	94901	1	
Schreibman	Judy	Las Gallinas Valley Sanitary District	300 Smith Ranch Road	San Rafael	CA	94903	1	
Williams	Mark	Las Gallinas Valley Sanitary District	300 Smith Ranch Road	San Rafael	CA	94903	1	
Damron	Andrew	Napa Sanitation District	1515 Soscol Ferry Road	Napa	CA	94558	1	

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Karkal	Sandeep	Novato Sanitary District	500 Davidson Street	Novato	CA	94945	1	
Kirchner	Ryan	Sonoma Valley County Sanitation District	22675 8th St. East	Sonoma	CA	95476	1	
Lewis	Liz	Marin County Flood Control & Water Conservation District	3501 Civic Center Dr.	San Rafael	CA	94913-4186	1	
Camargo-Martinez	Noemi	Bel Marin Keys Community Service District	4 Montego Key	Novato	CA	94949	1	
Chase	Darrick	Bel Marin Keys Community Service District	4 Montego Key	Novato	CA	94949	1	
Korten	Max	Marin County Open Space District	3501 Civic Center Drive, Room 260	San Rafael	CA	94903	1	
Keene	Bill	Sonoma County Agricultural Preservation & Open Space District	747 Mendocino Avenue, #100	Santa Rosa	CA	95401-4850	1	
Minton	Valerie	Sonoma Resource Conservation District	1221 Farmers Lane, Suite F	Santa Rosa	CA	95405	1	
Gipson	Rita	Valley Cemetery, Cemetery Services	#1 The Plaza	Sonoma	CA	95476		1
Gipson	Rita	Mountain Cemetery, Cemetery Services	#1 The Plaza	Sonoma	CA	95476		1
Juricich	Lissa	Sonoma Valley Unified School District	17850 Railroad Ave	Sonoma	CA	95476-3703		1
		Waugh School District	1851 Hartman Lane	Petaluma	CA	94954		1
		Wilson School District	3775 Bodega Avenue	Petaluma	CA	94954		1
		Petaluma City School	200 Douglas St.	Petaluma	CA	94952		1
		Old Adobe School District	845 Crinella Dr.	Petaluma	CA	94954		1

Last Name	First Nam	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
		Cinnabar School District	286 Skillman Lane	Petaluma	CA	94952		1
		Pacific Gas & Electric Company	210 Corona Road	Petaluma	CA	94954		1
		AT&T	2521 Occidental Road	Santa Rosa	CA	95401		1
		AT&T Cable	1455 N. McDowell Blvd.	Petaluma	CA	94954		1
		Petaluma Health Care District	1425 N. McDowell Blvd., Ste. 103	Petaluma	CA	94954		1
		Petaluma Valley Hospital	400 N. McDowell Blvd	Petaluma	CA	94954		1
							21	**15**
							NOP Doc	**NOP Card**

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Wood	Jim	California State Assembly, District 2	50 D Street, Suite 450	Santa Rosa	CA	95404	1	
Aguiar-Curry	Cecilia	California State Assembly, District 4	2721 Napa Valley Corporate Drive	Napa	CA	94558	1	
Levine	Marc	California State Assembly, District 10	50 D Street, Suite 301	Santa Rosa	CA	95404	1	
McGuire	Mike	California State Senate, District 2	50 D Street, Suite 120A	Santa Rosa	CA	95404	1	
Dodd	Bill	California State Senate, District 3	50 D Street, Suite 300	Santa Rosa	CA	95404	1	
Grossman	Denny	Governor's Office of Planning & Research	PO Box 3044	Sacramento	CA	95812-3044	1	
		California State Clearinghouse	1400 10th Street	Sacramento	CA	95814	15	
Cope	Grant	California Environmental Protection Agency	P.O. Box 2815	Sacramento	CA	95812-2815	1	
Tjernell	Kristopher	California Resources Agency	1416 9th Street, #1311	Sacramento	CA	95814	1	
Nemeth	Karla	California Resources Agency	1416 9th Street, #1311	Sacramento	CA	95814	1	
Floerke	Robert W.	California Department of Fish & Wildlife	7329 Silverado Trail	Yountville	CA	94598	1	
Wilson	Scott	California Department of Fish & Wildlife	7329 Silverado Trail	Yountville	CA	94598	1	
MacIntyre	Kirsten	California Department of Fish & Wildlife	1416 9th Street, 12th Floor	Sacramento	CA	95814	1	
Bonham	Charlton	California Department of Fish & Wildlife	1416 9th Street, 12th Floor	Sacramento	CA	95814	1	
		California Department of Water Resources, Integrated Water Management	P.O. Box 942836	Sacramento	CA	95814-3515	1	
		California Department of Water Resources, Strategic Water Planning Branch	P.O. Box 942836	Sacramento	CA	94236	1	

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
		California Department of Water Resources, North Central District	P.O. Box 942836	Sacramento	CA	94236	1	
Wieking	Jim	California Department of Water Resources	901 P Street	Sacramento	CA	95814	1	
Robles	Dianna	State Water Resources Control Board	PO Box 944212	Sacramento	CA	94244-2120	1	
Marcus	Felicia	State Water Resources Control Board	P.O. Box 100	Sacramento	CA	95812-0100	1	
		State Water Resources Control Board, Office of Water Recycling	P.O. Box 100	Sacramento	CA	95812-0100	1	
		State Water Resources Control Board, Division of Water Quality	P.O. Box 100	Sacramento	CA	95812-0100	1	
		State Water Resources Control Board, Division of Financial Assistance	P.O. Box 100	Sacramento	CA	95812-0100	1	
Hart	Katie	San Francisco Bay Regional Water Quality Control Board	1515 Clay Street, Ste. 1400	Oakland	CA	94612	1	
Hill	Stephen	San Francisco Bay Regional Water Quality Control Board	1515 Clay Street, Ste. 1400	Oakland	CA	94612	1	
Johnson	Bill	San Francisco Bay Regional Water Quality Control Board	1515 Clay Street, Ste. 1400	Oakland	CA	94612	1	
Morrison	Liz	San Francisco Bay Regional Water Quality Control Board	1515 Clay Street, Ste. 1400	Oakland	CA	94612	1	
Lowe	Lindy	Bay Conservation & Development Commission (BCDC)	455 Golden Gate Avenue, Ste. 10	San Francisco	CA	94102-7019	1	
Schuchat	Samuel	California Coastal Conservancy	1515 Clay St.	Oakland	CA	94612	1	
Cliff	Steve	California Air Resources Board	P.O. Box 2815	Sacramento	CA	95811	1	
Planning Office		Bay Area Air Quality Mgmt District	375 Beale Street, Suite 600	San Francisco	CA	94105	1	
		Northern Sonoma Air Pollution Control District	150 Matheson Street	Healdsburg	CA	95448		1

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Burton	Bruce	CA Dept of Public Health	50 D Street, #200	Santa Rosa	CA	95404		
Brownwood	Bob	CA Dept of Public Health	50 D Street, #200	Santa Rosa	CA	95404		
		California Department of Public Health, Food & Drug Branch	P.O. Box 997435	Sacramento	CA	95899-7435	1	
David	Robert	California Department of Health & Human Services	1600 9th Street, Room 460	Sacramento	CA	95814	1	
Knight	Eric	California Energy Commission, Environmental Protection Office	1516 9th St., MS-29	Sacramento	CA	95814-5512		1
Miranda	Hazel	California Public Utilities Commission, Office of Governmental Affairs	505 Van Ness Avenue	San Francisco	CA	94102	1	
		California Department of Food & Agriculture, Food Safety Services	1220 N Street, #104	Sacramento	CA	95814	1	
Mangat	Lisa	California Department of Parks & Recreation	PO Box 942896	Sacramento	CA	94296	1	
Willis-Hunter	Twila	California Department of Parks & Recreation, Historical Resources Commission	1725 23rd St., Ste. 100	Sacramento	CA	95816	1	
Sandoval	Gloria	California Department of Parks & Recreation, Division of Boating & Waterways	1 Capitol Mall, Ste. 500	Sacramento	CA	95814		1
Polanco	Julianne	California Office of Historic Preservation	1725 23rd St., Ste. 100	Sacramento	CA	95816	1	
Badal	Philip	California Department of Transportation, Office of Environmental Analysis	PO Box 23660	Oakland	CA	94623-0660	1	
Paich	Allison	Caltrans, Division of Right of Way	PO Box 23660	Oakland	CA	94623-0660		1
Maurice	Patricia	Caltrans, Local Development/Intergovernmental Review Branch	PO Box 23660	Oakland	CA	94623-0660	1	
		California Highway Patrol	6100 Labath Ave.	Rohnert Park	CA	94928		1
		California Department of Transportation, Aeronautics Division	1120 N St., MS 49	Sacramento	CA	95814		1
Oggins	Cy	California State Lands Commission	100 Howe Avenue, Suite 100 Sou	Sacramento	CA	95825	1	

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Bay	Duane	Association of Bay Area Governments	375 Beale Street, Suite 700	San Francisco	CA	94105	1	
O'Bryant	Dennis	California Department of Conservartion, Division of Land Resource Protection	801 K Street, MS 14-15	Sacramento	CA	95814-3528	1	
		California Department of Housing & Community Development	2020 W. El Camino Ave.	Sacramento	CA	95833		1
Ehlers	Bryan	California Department of Resources Recycling & Recovery	P.O. Box 4025	Sacramento	CA	95812-4025		1
Davis	Ronald	San Quentin State Prison, Warden's Office	San Quentin State Prison	San Quentin	CA	94974	1	
Gomez	Cynthia	Native American Heritage Commission	1550 Harbor Boulevard, Suite 100	West Sacramento	CA	95691	1	
McQuillan	Buffy	Federated Indians of Graton Rancheria	6400 Redwood Drive, Suite 300	Rohnert Park	CA	94928	1	
Yonemura	Randy	Iona Band of Miwok Indians	P.O. Box 699	Plymouth	CA	95669	1	
Reyes	Stephanie	Middletown Rancheria of Pomo Indians	P.O. Box 1035	Middletown	CA	95461	1	
Salsedo	Vincent	Mishewal Wappo Tribe of Alexander Valley	350 E Street	Santa Rosa	CA	95404	1	
Kitner	James	Yocha Dehe Wintun Nation	P.O. Box 18	Brooks	CA	95606	1	
Mansourian	Farhad	Sonoma-Marin Area Rail Transit District	5401 Old Redwood Highway, Suit	Petluma	CA	94954	1	
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							NOP Doc	**NOP Card**

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Huffman	Jared	U.S. House of Representatives, District 2	206 G St., Unit #3	Petaluma	CA	94952	1	
Thompson	Mike	U.S. House of Representatives, District 5	2300 County Cetner Dr., Ste. A100	Santa Rosa	CA	95403	1	
Feinstein	Dianne	U.S. Senate, California	One Post St., Ste. 2450	San Franscisco	CA	94104	1	
Harris	Kamala	U.S. Senate, California	50 United Nations Plaza, Suite 5584	San Francisco	CA	94102	1	
Kleinsmith	Doug	U.S. Bureau of Reclamation	2800 Cottage Way	Sacramento	CA	95825	1	
Goforth	Kathleen	U.S. Environmental Protection Agency, Region 9	75 Hawthorne Street	San Francisco	CA	94105	1	
Strauss	Alexis	U.S. Environmental Protection Agency, Region 9	75 Hawthorne Street	San Francisco	CA	94105	1	
Bottoms	Rick	U.S. Army Corps of Engineers, Regulatory Division	1455 Market Street, 16th Floor	San Francisco	CA	94103	1	
Costa	Holly	U.S. Army Corps of Engineers, Regulatory Division	1455 Market Street, 16th Floor	San Francisco	CA	94105	1	
Wantuck	Richard	National Marine Fisheries Service	777 Sonoma Avenue, #325	Santa Rosa	CA	95404	1	
Stern	Gary	National Marine Fisheries Service	777 Sonoma Avenue, #325	Santa Rosa	CA	95404	1	
Ryan	Olah	U.S. Fish & Wildlife Service	2800 Cottage Way #W-2605	Sacramento	CA	95825-1846	1	
Shiffer	Pat	U.S. Geological Survey, Water Resources Division	6000 J Street, Placer Hall	Sacramento	CA	95819	1	
Lomen	James	Federal Aviation Administration	1000 Marina Blvd., Ste. 220	Brisbane	CA	94005-1835	1	
De Shong	Casey	Federal Emergency Management Agency	1111 Broadway, Ste. 1200	Oakland	CA	94607-4052		1
		USDA, Natural Resource Conservation District	5401 Old Redwood Highway, Ste. 100	Petaluma	CA	94954	1	
							16	**1**
							NOP Doc	**NOP Card**

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Keller	David	Friends of the Eel River	1327 I Street	Petaluma	CA	94952	1	
Gardner	Shari	Friends of the Napa River	68 Coombs St., #B	Napa	CA	94559	1	
		Friends of Novato Creek	1092 Bell Marin Keys Boulevard	Novato	CA	94949	1	
Yarish	Tim	Friends of the Esteros	23 Nelson Avenue	Mill Valley	CA	94941	1	
Kavanaugh	Babs	Friends of the Petaluma River	260H N. Water Street	Petaluma	CA	94952	1	
McEnhill	Don	Russian River Keepers	PO Box 1335	Healdsburg	CA	95448	1	
		Russian River Watershed Protection Committee	Post Office Box 501	Guerneville	CA	95446	1	
Egger	Frank	North Coast Rivers Alliance	13 Meadow Way	Fairfax	CA	94930	1	
Yarish	Tim	Salmon Protection and Watershed Network (SPAWN)	9255 Sir Francis Drake Blvd.	Olema	CA	94950	1	
		United Anglers Casa Grande	333 Casa Grande Road	Petaluma	CA	94954		1
Machtinger	Steven	Bay Institute	Pier 39, Box #200	San Francisco	CA	94133	1	
Jacob	George	Bay Institute	350 Bay St.	San Francisco	CA	94133	1	
Downs	H. R.	OWL Foundation	1390 N. McDowell Blvd. Suite G 306	Petaluma	CA	94954	1	
Malan	Chris	Living Rivers Council	1370 Trancas Ave. West, PMB-614	Napa	CA	94559	1	
		G.U.L.P.	1230 Olive Hill Lane	Napa	CA	94559	1	
Moore	Gerald & Mary Edith	Petaluma Wetlands Alliance	1628 E. Madison St.	Petaluma	CA	94954-2321	1	

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Penn	Howard	Planning and Conservation League	1107 9th Street, Suite 901	Sacramento	CA	95814		1
Hartman	Amy	Greenbelt Alliance	1652 West Texas Street, Suite 203	Fairfield	CA	94533		1
Hshore	Teri	Greenbelt Alliance	555 5th Street, Suite 300A	Santa Rosa	CA	95401	1	
Hertel	Meghan	Audubon California	400 Capitol Mall, Ste. 1535	Sacramento	CA	95814	1	
Salzman	Barbara	Marin Audubon Society	P.O. Box 599	Mill Valley	CA	94942-0599	1	
Thompson	Laura	San Francisco Bay Trail, ABAG	375 Beale Street, Suite 700	San Francisco	CA	94105		1
Lewis	David	Save the Bay	1330 Broadway, Ste. 1800	Oakland	CA	94612-2519	1	
Chabot	Warner	SF Estuary Institute	4911 Central Ave.	Richmod	CA	94804	1	
Powers	Kate	Marin Conservation League	175 N/ Redwood Dr., Set. 135	San Rafael	CA	94903	1	
Berbeco	Minda	Sierra Club	2530 San Pablo Avenue, Ste. I	Berkeley	CA	94702-2000		1
Al-Shamma	Nabeel	Sierra Club	P.O. Box 466	Santa Rosa	CA	95402	1	
Perrey	Max	Sierra Club Marin Group	51 Tamal Vista Blvd.	Corte Madera	CA	94925	1	
Rusche	Susan	The Environmental Forum of Marin	P.O. Box 151546	San Rafael	CA	94915		1
		Valley of the Moon Alliance	P.O. Box 95	Kenwood	CA	95452	1	
Ling	Brian	Sonoma County Alliance	P.O. Box 1842	Santa Rosa	CA	95402		1
		Sonoma County Water Coalition	55 Ridgeway Ave.	Santa Rosa	CA	95401	1	

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Koehler	Dave	Sonoma Land Trust	822 5th St.	Santa Rosa	CA	95404		1
Dale	Richard	Sonoma Ecology Center	P.O. Box 1486	Eldridge	CA	95431		1
Vilms	Peeter	Sonoma County Conservation Council	PO Box 4346	Santa Rosa	CA	95402		1
Fugett	Kerry	Sonoma County Conservation Action	540 Pacific Avenue	Santa Rosa	CA	95404		1
Cliver	Don	Novato Chamber of Commerce	807 De Long Ave.	Novato	CA	94945		1
Pellegrini	Onita	Petaluma Chamber of Commerce	6 Petaluma Blvd. N., Ste. A2	Petaluma	CA	94952		1
Orloff	Lisa	Rohnert Park Chamber of Commerce	101 Gold Course Dr., C-7	Rohnert Park	CA	94928		1
Coe	Jonathan	Santa Rosa Chamber of Commerce	50 Old Courthouse Square, Suite 110	Santa Rosa	CA	95404		1
Shults	Patricia	Sonoma Valley Chamber of Commerce	651-A Broadway	Sonoma	CA	95476		1
Emmi	Jeremy	National Sustainable Agriculture Coalition	110 Maryland Avenue NE, Ste. 209	Washington	DC	20002		1
Matteis	Richard	California Farm Bureau Federation	2300 River Plaza Drive	Sacramento	CA	95833		1
Putman	Jennifer	Napa Valley Grape Growers	1795 3rd St.	Napa	CA	94559		1
Butler	Heather	Napa Valley Vintners Association	P.O. Box 141	St. Helena	CA	94574		1
Bosco	Carla	Carneros (Wine) Quality Alliance	P.O. Box 189	Vineyard	CA	95487-0189		1
Aguirre	John	California Association of Winegrape Growers	1121 L Street, Ste. 304	Sacramento	CA	95814		1
Kruse	Karissa	Sonoma County Winegrowers	400 Aviation Blvd., Suite 500	Santa Rosa	CA	95403		1

Last Name	First Name	Groups or Affiliation	Address	City	State	Zip	NOP Doc	NOP Card
Anderson	Bob	United WineGrowers for Sonoma County	P.O. Box 382	Santa Rosa	CA	95402		1
Jordon	Allison	Wine Institute	425 Market Street, Ste. 1000	San Francisco	CA	94105		1
Dunlap	John		2111 Third Avenue	Napa	CA	94558		1
Nielsen	Karen & Vagn		20650 Burndale Road	Sonoma	CA			1
Buckley	Barry		12 Lovejoy Way	Novato	CA	94949		1
Pons	Kathy		P.O. Box 632	Kenwood	CA	95452		1
Yarish	Tom		23 Nelson Avenue	Mill Valley	CA	94941		1
							25	**30**
							NOP Doc	**NOP Card**

APN	MailStrAdd	MailCtySta	MailZip5	MailZip4	SitusFrm1	SitusFrm2	SitusFrmZip5
052-351-041	PO BOX 280	EL VERANO, CA	95433	0280	19039 BAY ST	SONOMA, CA	95476
052-302-019	18545 HAPPY LN	SONOMA, CA	95476	4314	475 VERANO AVE	SONOMA, CA	95476
052-302-020	17175 CEDAR AVE	SONOMA, CA	95476	3346	479 VERANO AVE	SONOMA, CA	95476
052-302-028	PO BOX 1639	BOYES HOT SPRINGS, CA	95416		18901 RAILROAD AVE	SONOMA, CA	95476
052-301-004	18928 RAILROAD AVE	SONOMA, CA	95476		18928 RAILROAD AVE	SONOMA, CA	95476
052-302-029	971 GLENVIEW DR	SAN BRUNO, CA	94066	2723	475 ARBOR AVE	SONOMA, CA	95476
052-354-010	PO BOX 434	EL VERANO, CA	95433	0434	19035 RAILROAD AVE	SONOMA, CA	95476
052-351-037	PO BOX 648	EL VERANO, CA	95433	0648	19092 RAILROAD AVE	SONOMA, CA	95476
052-351-036	18470 HALF MOON ST	SONOMA, CA	95476		19080 RAILROAD AVE	SONOMA, CA	95476
052-354-008	1203 PEARCE DR	SONOMA, CA	95476		19033 RAILROAD AVE	SONOMA, CA	95476
052-351-022	19004 RAILROAD AVE	SONOMA, CA	95476		19004 RAILROAD AVE	SONOMA, CA	95476
052-351-010	PO BOX 129	EL VERANO, CA	95433		19007 BAY ST	SONOMA, CA	95476
052-351-021	19010 RAILROAD AVE	SONOMA, CA	95476		19010 RAILROAD AVE	SONOMA, CA	95476
052-354-013	PO BOX 368	EL VERANO, CA	95433	0368	480 VERANO AVE	SONOMA, CA	95476
052-351-039	PO BOX 185	EL VERANO, CA	95433		660 VERANO AVE	SONOMA, CA	95476
052-351-038	2300 GROVE ST	SONOMA, CA	95476	6034	19094 RAILROAD AVE	SONOMA, CA	95476
052-351-034	PO BOX 546	EL VERANO, CA	95433		19095 BAY ST	SONOMA, CA	95476
052-354-011	PO BOX 298	EL VERANO, CA	95433	0298	19025 RAILROAD AVE	SONOMA, CA	95476
052-354-009	19031 RAILROAD AVE	SONOMA, CA	95476		19031 RAILROAD AVE	SONOMA, CA	95476
052-351-015	PO BOX 1825	BOYES HOT SPRINGS, CA	95416		19003 BAY ST	SONOMA, CA	95476
052-351-028	2300 GROVE ST	SONOMA, CA	95476	6034	19030 RAILROAD AVE	SONOMA, CA	95476
052-351-012	PO BOX 14	SONOMA, CA	95476		19097 BAY ST	SONOMA, CA	95476
052-354-012	1491 NUT TREE LN	SONOMA, CA	95476	4878	19015 RAILROAD AVE	SONOMA, CA	95476
052-363-009	817 WEST ST	PETALUMA, CA	94952	2045	752 LAUREL AVE	SONOMA, CA	95476
052-363-016	19096 BAY ST	SONOMA, CA	95476		19096 BAY ST	SONOMA, CA	95476
052-363-003	1 TEWKSBURY AVE	RICHMOND, CA	94801		19050 BAY ST	SONOMA, CA	95476
052-346-014	PO BOX 129	EL VERANO, CA	95433		705 LAUREL AVE	SONOMA, CA	95476
052-346-017	748 ELLIOTT ST	SONOMA, CA	95476		19004 BAY ST	SONOMA, CA	95476
052-363-004	PO BOX 14381	SANTA ROSA, CA	95402	6381	19094 BAY ST	SONOMA, CA	95476
052-346-018	PO BOX 604	EL VERANO, CA	95433	0604	19016 BAY ST	SONOMA, CA	95476
052-301-005	18916 RAILROAD AVE	SONOMA, CA	95476		18916 RAILROAD AVE	SONOMA, CA	95476
052-363-008	2391 BAYVIEW CT	CONCORD, CA	94520	1308	746 LAUREL AVE	SONOMA, CA	95476
052-346-025	PO BOX 709	EL VERANO, CA	95433	0709	723 LAUREL AVE	SONOMA, CA	95476
052-346-021	PO BOX 328	EL VERANO, CA	95433		747 LAUREL AVE	SONOMA, CA	95476
052-346-006	PO BOX 314	EL VERANO, CA	95433	0314	710 VERANO AVE	SONOMA, CA	95476
052-346-013	PO BOX 129	EL VERANO, CA	95433		705 LAUREL AVE	SONOMA, CA	95476
052-346-004	2517 PAWNEE DR	WALNUT CREEK, CA	94598		730 VERANO AVE	SONOMA, CA	95476
052-346-005	PO BOX 565	EL VERANO, CA	95433	0565	720 VERANO AVE	SONOMA, CA	95476
052-346-022	PO BOX 1838	BOYES HOT SPRINGS, CA	95416		737 LAUREL AVE	SONOMA, CA	95476
052-346-007	706 VERANO AVE	SONOMA, CA	95476		706 VERANO AVE	SONOMA, CA	95476
052-720-001	2621 ENSENADA WAY	SAN MATEO, CA	94403		18863 PARK TREE LN	SONOMA, CA	95476
052-302-033	PO BOX 544	EL VERANO, CA	95433	0544	483 VERANO AVE	SONOMA, CA	95476
052-720-020	635 GREGORY CIR	SONOMA, CA	95476	6460	18857 PARK TREE LN	SONOMA, CA	95476
018-021-004	650 HOWE AVE	SACRAMENTO, CA	95825	4731	0 3RD ST	SONOMA, CA	95476
052-354-014	PO BOX 572	EL VERANO, CA	95433	0572	402 VERANO AVE	SONOMA, CA	95476
018-021-003	1 THE PLZ	SONOMA, CA	95476	6618	0 3RD ST	SONOMA, CA	95476
052-343-028	PO BOX 517	EL VERANO, CA	95433	0517	703 VERANO AVE	SONOMA, CA	95476
052-343-027	PO BOX 506	EL VERANO, CA	95433	0506	712 VERANO AVE	SONOMA, CA	95476

APN	MailStrAdd	MailCtySta	MailZip5	MailZip4	SitusFrm1	SitusFrm2	SitusFrmZip5
052-343-026	715 VERANO AVE	SONOMA, CA	95476		715 VERANO AVE	SONOMA, CA	95476
126-011-051	2 KATSURA	PURCHASE, NY	10577		20425 8TH STREET E	SONOMA, CA	95476
018-021-006	NO 1 PLAZA	SONOMA, CA	95476		131 1ST STREET W	SONOMA, CA	95476
018-071-007	NO 1 PLAZA	SONOMA, CA	95476		131 1ST STREET W	SONOMA, CA	95476
018-071-008	1 THE PLZ	SONOMA, CA	95476	6618	151 1ST STREET W	SONOMA, CA	95476
018-031-003	NO 1 PLAZA	SONOMA, CA	95476		131 1ST STREET W	SONOMA, CA	95476
018-032-009	2555 MENDOCINO AVE	SANTA ROSA, CA	95403	2803	0 NONE	SONOMA, CA	95476
018-032-008	2555 MENDOCINO AVE	SANTA ROSA, CA	95403	2803	0 NONE	SONOMA, CA	95476
092-010-021	1 THE PLZ	SONOMA, CA	95476	6618	0 1ST STREET W	SONOMA, CA	95476
018-031-005	1551 15TH STREET	SANTA MONICA, CA	90404		99 1ST ST	SONOMA, CA	95476
018-032-007	1 THE PLZ	SONOMA, CA	95476	6618	0 NONE	SONOMA, CA	95476
018-032-006	1 THE PLZ	SONOMA, CA	95476	6618	NONE	SONOMA, CA	95476
092-010-022	2555 MENDOCINO AVE	SANTA ROSA, CA	95403	2803	0 1ST STREET W	SONOMA, CA	95476
018-021-005	404 AVIATION BLVD	SANTA ROSA, CA	95403	9073	NONE	SONOMA, CA	95476
126-011-048	338 SPEAR ST UNIT 23E	SAN FRANCISCO, CA	94105	6180	634 NAPA RD	SONOMA, CA	95476
126-011-053	1097 HOWARD ST UNIT 305	SAN FRANCISCO, CA	94103		620 NAPA RD	SONOMA, CA	95476
128-281-013	305 S E ST	SANTA ROSA, CA	95404	5132	20455 5TH STREET E	SONOMA, CA	95476
128-291-008	20450 5TH ST E	SONOMA, CA	95476		20450 5TH STREET E	SONOMA, CA	95476
128-291-015	610 NAPA RD	SONOMA, CA	95476	7707	610 NAPA RD	SONOMA, CA	95476
128-291-029	20496 5TH ST E	SONOMA, CA	95476	7717	NONE	SONOMA, CA	95476
128-291-014	75 BLOSSOM LN	SAN CARLOS, CA	94070	1602	600 NAPA RD	SONOMA, CA	95476
018-071-006	CAPITOL BLDG	SACRAMENTO, CA	95814		NONE	SONOMA, CA	95476
018-061-002	363 3RD ST W	SONOMA, CA	95476	5632	NONE	SONOMA, CA	95476
018-061-003	650 HOWE AVE	SACRAMENTO, CA	95825	4731	NONE	SONOMA, CA	95476
128-291-003	605 CURTIN LN	SONOMA, CA	95476	6403	594 NAPA RD	SONOMA, CA	95476
128-291-007	20464 5TH ST E	SONOMA, CA	95476		20464 5TH STREET E	SONOMA, CA	95476
128-291-023	614 NAPA RD	SONOMA, CA	95476		612 NAPA RD	SONOMA, CA	95476
128-291-028	20496 5TH ST E	SONOMA, CA	95476	7717	20496 5TH STREET E	SONOMA, CA	95476
126-021-059	PO BOX 826	SONOMA, CA	95476	0826	1290 NAPA RD	SONOMA, CA	95476
126-021-063	1947 IVY LN	PALO ALTO, CA	94303		1264 NAPA RD	SONOMA, CA	95476
126-012-022	1200 NAPA RD	SONOMA, CA	95476		0 NAPA RD	SONOMA, CA	95476
126-012-021	PO BOX 966	GLEN ELLEN, CA	95442		0 NAPA RD	SONOMA, CA	95476
126-061-052	2569 NAPA RD	SONOMA, CA	95476		2569 NAPA RD	SONOMA, CA	95476
126-061-051	1320 A KOBBE RD	SAN FRANCISCO, CA	95476		2579 NAPA RD	SONOMA, CA	95476
128-332-027	20525 5TH ST E	SONOMA, CA	95476		20525 5TH STREET E	SONOMA, CA	95476
128-332-013	20545 5TH ST E	SONOMA, CA	95476		20545 5TH STREET E	SONOMA, CA	95476
128-332-014	20555 5TH ST E	SONOMA, CA	95476		20555 5TH STREET E	SONOMA, CA	95476
126-011-052	5720 DEXTER CIR	ROHNERT PARK, CA	94928		646 NAPA RD	SONOMA, CA	95476
126-011-049	28 HENRY PL	MILLBRAE, CA	94030		658 NAPA RD	SONOMA, CA	95476
126-011-054	620 NAPA RD	SONOMA, CA	95476		620 NAPA RD	SONOMA, CA	95476
126-031-057	885 NAPA RD	SONOMA, CA	95476		885 NAPA RD	SONOMA, CA	95476
126-032-032	BOX 9000 PRESIDIO STATION	SAN FRANCISCO, CA	94129		8TH STREET E	SONOMA, CA	95476
126-031-060	23355 MILLERICK RD	SONOMA, CA	95476		933 NAPA RD	SONOMA, CA	95476
126-032-031	1884 MOUNTAIN VIEW DR	TIBURON, CA	94920	1810	20580 E 8TH ST	SONOMA, CA	95476
126-031-066	PO BOX 341	GLEN ELLEN, CA	95442	0341	997 NAPA RD	SONOMA, CA	95476
126-032-030	PO BOX 605	SONOMA, CA	95476		20470 8TH STREET E	SONOMA, CA	95476
126-031-058	893 NAPA RD	SONOMA, CA	95476	7741	893 NAPA RD	SONOMA, CA	95476
126-031-071	PO BOX 341	GLEN ELLEN, CA	95442	0341	1013 NAPA RD #A	SONOMA, CA	95476

APN	MailStrAdd	MailCtySta	MailZip5	MailZip4	SitusFrm1	SitusFrm2	SitusFrmZip5
126-032-033	PO BOX 605	SONOMA, CA	95476		1025 NAPA RD	SONOMA, CA	95476
126-031-059	895 NAPA RD	SONOMA, CA	95476		895 NAPA RD	SONOMA, CA	95476
126-031-061	20645 8TH ST E	SONOMA, CA	95476	9591	955 NAPA RD	SONOMA, CA	95476
126-031-062	PO BOX 604	SONOMA, CA	95476	0604	621 NAPA RD	SONOMA, CA	95476
126-031-063	5 TRINA CT	WALNUT CREEK, CA	94596	5833	641 NAPA RD	SONOMA, CA	95476
128-291-027	619 46TH AVE	SAN FRANCISCO, CA	94121	2405	540 NAPA RD	SONOMA, CA	95476
126-101-034	2300 NAPA RD	SONOMA, CA	95476		LOVALL VALLEY RD	SONOMA, CA	95476
126-150-007	PO BOX 167	VINEBURG, CA	95487		1770 NAPA RD	SONOMA, CA	95476
126-101-032	2800 NAPA RD	SONOMA, CA	95476		2800 NAPA RD	SONOMA, CA	95476
128-291-011	528 NAPA RD	SONOMA, CA	94121		528 NAPA RD	SONOMA, CA	95476
128-291-018	558 NAPA RD	SONOMA, CA	95476		558 NAPA RD	SONOMA, CA	95476
126-061-041	PO BOX 5420	NAPA, CA	94581	0420	21200 BURNDALE RD	SONOMA, CA	95476
128-332-036	495 NAPA RD	SONOMA, CA	95476	7626	495 NAPA RD	SONOMA, CA	95476
126-042-011	3645 EVERGREEN CT	NAPA, CA	94558	2813	1791 NAPA RD	SONOMA, CA	95476
126-042-017	1577 NAPA RD	SONOMA, CA	95476		1577 NAPA RD	SONOMA, CA	95476
128-292-012	609 NAPA RD	SONOMA, CA	95476		609 NAPA RD	SONOMA, CA	95476
128-292-010	1391 HARWALT DR	LOS ALTOS, CA	94024		585 NAPA RD	SONOMA, CA	95476
128-291-025	554 NAPA RD	SONOMA, CA	95476	7705	554 NAPA RD	SONOMA, CA	95476
126-160-007	583 W NAPA ST	SONOMA, CA	95476	6520	1580 NAPA RD	SONOMA, CA	95476
126-160-009	PO BOX 428	VINEBURG, CA	95487		1668 NAPA RD	SONOMA, CA	95476
126-150-008	PO BOX 613	VINEBURG, CA	95487	0613	2025 DENMARK ST	SONOMA, CA	95476
126-021-065	1462 NAPA RD	SONOMA, CA	95476	9637	1462 NAPA RD	SONOMA, CA	95476
126-150-006	1754 NAPA RD	SONOMA, CA	95476	9634	1754 NAPA RD	SONOMA, CA	95476
126-160-008	1670 NAPA RD	SONOMA, CA	95476		1670 NAPA RD	SONOMA, CA	95476
126-021-060	1500 NAPA RD	SONOMA, CA	95476		1500 NAPA RD	SONOMA, CA	95476
128-291-026	PO BOX 2247	SONOMA, CA	95476		562 NAPA RD	SONOMA, CA	95476
126-021-058	1472 NAPA RD	SONOMA, CA	95476		1472 NAPA RD	SONOMA, CA	95476
126-160-006	PO BOX 509	SONOMA, CA	95476		1580 NAPA RD	SONOMA, CA	95476
126-021-064	PO BOX 29269	SAN FRANCISCO, CA	94129		1340 NAPA RD	SONOMA, CA	95476
126-160-002	1588 NAPA RD	SONOMA, CA	95476		1588 NAPA RD	SONOMA, CA	95476
126-021-057	1200 NAPA RD	SONOMA, CA	95476		1200 NAPA RD	SONOMA, CA	95476
126-061-029	197 JOHN ROBERTS DR	COTATI, CA	94931	5386	2187 WELZEL LN	SONOMA, CA	95476
126-061-031	2125 WELZEL LN	SONOMA, CA	95476	9701	2125 WELZEL LN	SONOMA, CA	95476
126-061-028	2195 WELZEL LN	SONOMA, CA	95476	9701	2195 WELZEL LN	SONOMA, CA	95476
126-032-020	PO BOX 856	SONOMA, CA	95476		1065 NAPA RD	SONOMA, CA	95476
126-042-005	PO BOX 2	VINEBURG, CA	95487		20735 BURNDALE RD	SONOMA, CA	95476
126-041-001	1345 NAPA RD	SONOMA, CA	95476		1345 NAPA RD	SONOMA, CA	95476
126-032-002	PO BOX 605	SONOMA, CA	95476		1025 NAPA RD	SONOMA, CA	95476
126-041-019	1451 NAPA RD	SONOMA, CA	95476	9638	1451 NAPA RD	SONOMA, CA	95476
126-042-009	20715 OLD BURNDALE RD	SONOMA, CA	95476		20715 BURNDALE RD	SONOMA, CA	95476
126-042-018	1673 NAPA RD	SONOMA, CA	95476		1673 NAPA RD	SONOMA, CA	95476
126-041-010	1345 NAPA RD	SONOMA, CA	95476		1361 NAPA RD	SONOMA, CA	95476
126-041-023	1190 KILDARE WAY	PINOLE, CA	94564	2709	1365 NAPA RD	SONOMA, CA	95476
126-102-013	2989 NAPA RD	SONOMA, CA	95476		2989 NAPA RD	SONOMA, CA	95476
128-292-009	20590 5TH ST E	SONOMA, CA	95476	7903	NAPA RD	SONOMA, CA	95476
126-102-009	7 AMANDA LN	NOVATO, CA	94947		2725 NAPA RD	SONOMA, CA	95476
126-061-022	PO BOX 82	REDWOOD EST, CA	95044		2595 NAPA RD	SONOMA, CA	95476
126-061-039	20650 BURNDALE RD	SONOMA, CA	95476	9659	20650 BURNDALE RD	SONOMA, CA	95476

APN	MailStrAdd	MailCtySta	MailZip5	MailZip4	SitusFrm1	SitusFrm2	SitusFrmZip5
126-061-023	PO BOX 249	VINEBURG, CA	95487	0249	2587 NAPA RD	SONOMA, CA	95476
128-332-037	445 NAPA RD	SONOMA, CA	95476	7626	445 NAPA RD	SONOMA, CA	95476
126-042-010	1755 NAPA RD	SONOMA, CA	95476	9633	1755 NAPA RD	SONOMA, CA	95476

APPENDIX C
Newspaper Notices

North Bay Water Reuse Authority to Host Public Meetings in Preparation for Proposed Recycled Water Projects

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Please include a name, address, and telephone number of a contact person in your agency for all future correspondence on this subject. Please send your comments to:

NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

POLITICS

House budget blueprint key to success of Trump tax agenda

By Andrew Taylor
The Associated Press

WASHINGTON » Despite opposition from Republican moderates and conservatives, House leaders are pressing ahead with a budget plan whose success is critical to the party's hopes to deliver on one of President Donald Trump's top priorities — a GOP-only effort to overhaul the tax code.

The importance of the measure has been magnified by the cratering in the Senate of the Trump-backed effort to repeal President Barack Obama's health care law, leaving a rewrite of the tax code as the best chance for Trump to score a major legislative win this year. The measure would require about $200 billion worth of cuts to benefit programs and other so-called mandatory spending coupled with the tax plan.

The budget plan unveiled Tuesday is crucial because its passage would pave the way to pass a tax overhaul this fall without the fear of a filibuster by Senate Democrats.

But it also proposes trillions of dollars in cuts to the social safety net and other domestic programs and puts congressional Republicans at odds with Trump over cutting Medicare. It also would sharply boost military spending.

"In past years, the budget has only been a vision. But now, with the Republican Congress and a Republican White House, this budget is a plan for action," said Budget Committee Chair Diane Black, R-Tenn. "Now is our moment to achieve real results."

Unclear, however, is whether GOP leaders can get the budget measure through the House. Conservatives want a larger package of spending cuts to accompany this fall's tax overhaul bill, while moderates are concerned cuts to programs such as food stamps could go too far.

Black announced a committee vote for Wednesday, but was less confident of a vote by the entire House next week; a delay seems likely because of the ongoing quarrel between the GOP's factions.

The House GOP plan proposes to turn Medicare into a voucher-like program in which future retirees would receive a fixed benefit to purchase health insurance on the open market.

The plan promises to balance the budget through unprecedented and politically unworkable cuts across the budget. It calls for turning this year's projected $700 billion-or-so deficit into a tiny $9 billion surplus by 2027. It would do so by slashing $5.4 trillion over the coming decade, including almost $500 billion from Medicare amd $1.5 trillion from Medicaid and the Obama health law, along with sweeping cuts to benefits such as federal employee pensions, food stamps and tax credits for the working poor.

But in the immediate future the GOP measure is a budget buster. It would add almost $30 billion to Trump's $668 billion request for national defense. The GOP budget plan would cut non-defense agencies by $5 billion. And of the more than $4 trillion in promised saving from mandatory programs like Medicare and Medicaid, the plan assumes just $203 billion would actually pass this year.

FORMER HOUSE SPEAKER

Dennis Hastert released from prison

By Caryn Rousseau and Michael Tarm
The Associated Press

CHICAGO » Former U.S. House Speaker Dennis Hastert was released from prison in Minnesota and transferred to a Chicago reentry facility, according to the Federal Bureau of Prisons.

Hastert was sentenced to 15 months in prison in April 2016 in a banking violations case that revealed accusations he had sexually abused teenagers while coaching wrestling at a suburban Chicago high school.

The Bureau of Prisons said in an email that Hastert left the Minnesota prison on Monday and is now "under the jurisdiction" of a Chicago residential reentry management office. It's unclear whether Hastert was staying at a halfway house or whether he could be transferred to home confinement. Hastert's release date is listed as Aug. 16.

The Illinois congressman-turned-high-paid lobbyist had to serve at least 85 percent of his sentence, or just over a year. It's not uncommon for inmates to be released early for administrative or other reasons.

Hastert pleaded guilty to violating banking law in seeking to pay $3.5 million in hush money to keep the sex abuse secret. He is one of the highest-ranking U.S. politicians to ever go to prison, where he was known as Inmate No. 47991-424.

New Rotary Club seeks members

First and third Tuesdays at The Red Grape

INDEX-TRIBUNE STAFF REPORT

Sonoma is gaining another service club - the Rotary Club of Sonoma Sunrise.

"We're looking for Sonoma community members who want to help create a better Sonoma," said Tony Moll, the charter president.

Moll said, "We're building off of the amazing success of Rotary in this Valley and by starting this new club, Sonomans now have another time of the week to be able to attend meetings and join Rotary."

This new Rotary Club will be the only service club to meet in the morning. Allowing even those who work the common 9 a.m. to 5 p.m. the ability to join. "We're very excited about this new club, about extending Rotary's reach even further, and getting even more businesses involved," said Moll.

The club is looking for forward thinking and outgoing people who don't have a problem lending a hand. "People who care, and want to be around like-minded others," Moll said.

Anyone who is interested in attending, meetings are to be held from 7 to 8:30 a.m. at The Red Grape, on the first and third Tuesdays of every month The Red grape is located at 529 First St. W., just off of the Plaza.

To stay informed, follow the new Rotary Club's Facebook page, Rotary Club of Sonoma Sunrise.

The next meeting will be Tuesday, July 18.

BILL HOBAN/INDEX-TRIBUNE FILE PHOTO

Sonoma Valley High Booster President Alice Schimm talks about the Boosters at registration in 2015.

SVHS sets registration dates

School starts in less than a month

INDEX-TRIBUNE STAFF REPORT

Sonoma Valley High has set dates for registration, school pictures and class schedules.

Freshmen report from 4 to 7 p.m. Monday, Aug. 7, juniors and seniors from 4 to 7 p.m. Tuesday, Aug. 8, and sophomores from 4 to 7 p.m. Wednesday, Aug. 9. Registration will be held in Pfeiffer Gym and the pavilion.

Students take school ID photos, parents and students complete registration forms, take an optional office tour, make donations, pay for lost books and equipment, check out Chromebooks (if needed), receive senior project information (12th grade only) and pick up class schedules.

Parents are encouraged to attend back-to-school registration with their student. All students will have their school ID photo taken in the Pavilion. Parents and students will turn in their completed grade level packet forms and emergency cards, sign up for school communications, and seniors will collect information about Senior Project in Pfeiffer Gym. New this year, freshmen, sophomores and new students will pick up their Chromebook Monday, Aug. 7, and Wednesday, Aug. 9.

Registration packets for all grade levels and sport packets will be available at the SVHS main office starting Tuesday, Aug. 1. Office hours are 7:30 a.m. to 4 p.m. Packets will also be available after hours outside the main lobby doors.

Also at registration, parents and student will have the opportunity to obtain information and paperwork for school athletics and cheer, join the SVHS Boosters Club, purchase spirit wear and PE clothes, and register for Grad Night. Transportation and Food Services will also be present to collect forms on Monday, Aug. 7, and Tuesday Aug. 8.

Parents can save time by filling out all required paperwork before they arrive and by bringing all paperwork to registration. Students must be cleared of all book and equipment fines from last year in order to receive their current class schedule.

Donations for the 2017-18 school year, $100 per student - $50 for each additional sibling are welcomed and utilized for:

- Student Engagement, Recognition and Activities (Dragon Days, Link Crew, Plus Program, homecoming, supplemental classroom supplies, incentives, field trips and the like.)
- Technology (maintenance and materials for labs and printers, opportunity for innovative practice.)
- Campus Beautification (enhancement of the physical environment with plants, benches, murals and the like.)
- Library (database maintenance, purchase new titles).

Purchase the ASB Activity Sticker, $65, and receive discounts to school activities and free admission to all home sporting events (not championship games) such as football, volleyball, boys and girls basketball.

Checks may be payable to SVHS. Credit cards will also be accepted. Parents are asked to bring small bills if paying with cash. After students have completed all the steps listed above they will receive their class schedule.

Sport Packets are available at the SVHS Main office, outside the Student Activities Office Window or on the high school website, sonomavalleyhigh.org, Click on the Athletics tab. Football tryouts begin Monday, Aug. 9, and packets are due by Friday, Aug. 4. All other fall sports begin Monday, Aug. 14, and packets due by Wednesday, Aug. 9. Reminder: all athletes must have a current physical or doctor's clearance before they can try out for any athletic or cheer team.

Photo workshop set at Jack London Park

Will be held on July 29

INDEX-TRIBUNE STAFF REPORT

Jack London State Historical Park is hosting a half-day photo workshop devoted to the "Art of Seeing Composition." Would-be photographers will learn from professional photographers John Ricca and Richard Valenti why good composition creates stronger images. They will be your guides to fulfill a photographic vision as attendees are inspired by the magical light pervading Jack London State Historic Park.

Attendees are asked to bring their DSLR, point and shoot or iPhone, camera manual, tripod (if you have one) but most of all bring their enthusiasm to improve their camera skills.

The workshop will be held from 8:30 to 11:30 a.m., Saturday, July 29, at the park, 2400 London Ranch Road in Glen Ellen. The cost is $35 and is limited to 14 participants. Register online at jacklondonpark.com.

Notice of Preparation Availability

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NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability Through Regional Reuse

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

POLICE BEAT

Boyfriend arrested after argument gets physical

Valley law enforcement incidents

INDEX-TRIBUNE STAFF REPORT

A Sonoma man was arrested on multiple felony charges after an argument with his live-in girlfriend turned physical.

On July 1, deputies were called to a residence in the 18000 block of Highway 12 for a dispute between a boyfriend and girlfriend over laundry. At one point, the suspect tried to grab the couple's 2-year-old child and leave. The victim tried to make a call and the suspect smashed the phone and punched the victim. The victim tried to lock the suspect out of the residence, but the suspect pushed the air conditioner into the residence and crawled in through the open window.

The suspect reportedly hit the victim again before grabbing her cell phone and leaving. When the deputies finally arrived, the suspect was nowhere to be found.

On July 7, the deputies called the suspect and convinced him to come to the Valley substation to turn himself in, which he did the next day. The suspect denied hitting the victim and said that he lives at the residence and pays rent.

But the deputies arrested Jesus Cuevas-Avendano, 24, on charges of felony burglary, felony robbery, felony threaten with intent to terrorize, domestic violence battery and damaging a wireless communications device. He was transported to the county jail.

In other incidents reported to Valley law enforcement recently:

Monday, June 26:

10 a.m. – A domestic dispute in the 1200 block of Sobre Vista Drive sent one person to the hospital with stab wounds and another to jail on felony charges. A male and female were having an argument and a third party tried to intervene. The third party reportedly tried to detain the suspect, but ended up getting stabbed in the leg instead. The suspect told deputies it was self-defense, but the deputies arrested Stanford Goodman, 19, of Sonoma, on charges of felony assault with a deadly weapon not a firearm, and transported him to jail.

Wednesday, June 28:

7:18 a.m. – Deputies responded to a report of an intoxicated male passed out in the food court at Sonoma Market. When they arrived, the found the man passed out with a paper bag containing an opened bottle of Korbel brandy. The 61-year-old Sonoma resident was arrested on charges of public intoxication and transported to jail.

Thursday, June 29:

2:41 a.m. – During a traffic stop in the 18600 block of Highway 12, the driver had no license, only a Mexican ID card. While the man was thumbing through his wallet, the deputy noticed a small bag of drugs in the wallet. At that point, the deputy got both the driver and his passenger out of the vehicle. The deputy found a glass pipe with methamphetamine residue and three small bags of drugs that later tested positive for cocaine along with several empty bags as well. The driver, a 24-year-old Sonoma resident, was charged with possession of a controlled substance, possession of drug paraphernalia and driving without a licensed. The passenger, Jorge M. Gonzalez-Fernandez, was charged with felony possession for sale of a narcotic or controlled substance. Both men were transported to jail.

8:01 p.m. – While on patrol in the area of Fremont Drive and Napa Road, a deputy saw a bicyclist who had an outstanding warrant. After pulling the cyclist over, the deputy found the man had drugs and was carrying a homemade weapon. The deputy arrested Daniel Williams, 36, of Sonoma, on charges of felony carrying a concealed dirk or dagger, possession of a controlled substance and the outstanding warrant. Williams received a chauffeured ride to the county jail.

To reach Sonoma Police:
996-3602

To reach the Sonoma Valley Substation:
996-9495

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WASHINGTON

'Let Obamacare fail,' Trump declares as GOP plan collapses

By Erica Werner and Alan Fram
The Associated Press

JABIN BOTSFORD — THE WASHINGTON POST

President Donald Trump, flanked by Vice President Mike Pence and National Security Adviser H.R. McMaster, speaks in the Roosevelt Room of the White House on Tuesday about health care reform and other matters.

WASHINGTON » President Donald Trump declared Tuesday it's time to "let Obamacare fail" after the latest GOP health care plan crashed and burned in the Senate, a stunning failure for the president, Republican leader Mitch McConnell and a party that has vowed for years to abolish the law.

In a head-spinning series of developments, rank-and-file Republican senators turned on McConnell and Trump for the third time in a row, denying the votes to move forward with a plan for a straight-up repeal of "Obamacare." This time, it was three GOP women — Susan Collins of Maine, Lisa Murkowski of Alaska, and Shelley Moore Capito of West Virginia — who delivered the death blow.

All had been shut out of McConnell's initial all-male working group on health care.

McConnell, who could afford to lose only two votes in the narrowly divided Senate, had turned to the repeal-only bill after his earlier repeal-and-replace measure was rejected on Monday. That had followed the failure of an earlier version of the bill last month.

The successive defeats made clear that despite seven years of promises to repeal former President Barack Obama's Affordable Care Act, Republicans apparently cannot deliver. Nonetheless, McConnell insisted he would move forward with a vote on his measure to repeal the law, effective in two years, with a promise to work — along with Democrats — to replace it in the meantime.

The vote to move ahead to the bill will take place early next week, McConnell announced late Tuesday. It appears doomed to fail, but GOP leaders want to put lawmakers on record on the issue and move on.

At the White House, Trump appeared to recognize defeat, at least for the moment, while insisting he bore none of the blame.

"I think we're probably in that position where we'll just let Obamacare fail," the president said. "We're not going to own it. I'm not going to own it. I can tell you that the Republicans are not going to own it. We'll let Obamacare fail and then the Democrats are going to come to us and they're going to say, 'How do we fix it?'"

Despite the current law's problems, most health care experts do not believe it is at immediate risk of outright failure, and Democratic cooperation to adjust the law is far from assured.

"They seem to have this notion that they can be a majority party, and have control of the White House, and not be responsible for bringing down the health care system," said Democratic Sen. Dick Durbin of Illinois. "It doesn't work that way."

Asked how he would justify the GOP's failure on health care to voters, McConnell responded: "Well, we have a new Supreme Court justice" — suggesting inaction on health care would be forgiven because of that success along with some regulatory roll-backs.

As the day began Tuesday, McConnell was hunting for votes to open debate on a revived version of legislation Congress sent to Obama's desk in 2015 that would have repealed major portions of Obamacare, with a two-year delay built in. He had turned to that approach after getting stunned Monday night by defections by Sens. Mike Lee of Utah and Jerry Moran of Kansas on a repeal-and-replace bill.

Many Republicans support the repeal-only approach, and they questioned how senators who voted for the legislation two years ago could oppose it now.

But for others, the implications were too severe now that the bill could actually become law with a Republican president in the White House ready to sign it. The Congressional Budget Office has estimated that more than 30 million people would lose insurance over a decade under the legislation.

Collins voted against the legislation in 2015 while Murkowski and Capito both supported it. Murkowski told reporters Tuesday that repealing the Affordable Care Act without the promise of a replacement would cause uncertainty and chaos.

"To just say repeal and 'Trust us, we're going to fix it in a couple of years,' that's not going to provide comfort to the anxiety that a lot of Alaskan families are feeling right now," she said.

CONGRESS

Budget blueprint key to success of tax agenda

By Andrew Taylor
The Associated Press

WASHINGTON » Despite opposition from Republican moderates and conservatives, House leaders are pressing ahead with a budget plan whose success is critical to the party's hopes to deliver on one of President Donald Trump's top priorities — a GOP-only effort to overhaul the tax code.

The importance of the measure has been magnified by the cratering in the Senate of the Trump-backed effort to repeal President Barack Obama's health care law, leaving a rewrite of the tax code as the best chance for Trump to score a major legislative win this year. The measure would require about $200 billion worth of cuts to benefit programs and other so-called mandatory spending coupled with the tax plan.

The budget plan unveiled Tuesday is crucial because its passage would pave the way to pass a tax overhaul this fall without the fear of a filibuster by Senate Democrats.

But it also proposes trillions of dollars in cuts to the social safety net and other domestic programs and puts congressional Republicans at odds with Trump over cutting Medicare. It also would sharply boost military spending.

"In past years, the budget has only been a vision. But now, with the Republican Congress and a Republican White House, this budget is a plan for action," said Budget Committee Chair Diane Black, R-Tenn. "Now is our moment to achieve real results."

Unclear, however, is whether GOP leaders can get the budget measure through the House. Conservatives want a larger package of spending cuts to accompany this fall's tax overhaul bill, while moderates are concerned cuts to programs such as food stamps could go too far.

The House GOP plan proposes to turn Medicare into a voucher-like program in which future retirees would receive a fixed benefit to purchase health insurance on the open market. Republicans have proposed the idea each year since taking back the House in 2011, but they've never tried to implement it — and that's not going to change now, even with a Republican as president.

"Republicans would destroy the Medicare guarantee for our seniors and inflict bone-deep cuts to Medicaid that would devastate veterans, seniors with long-term care needs, and rural communities," said Democratic leader Nancy Pelosi of California.

The plan promises to balance the budget through unprecedented and politically unworkable cuts across the budget. It calls for turning this year's projected $700 billion-or-so deficit into a tiny $9 billion surplus by 2027. It would do so by slashing $5.4 trillion over the coming decade, including almost $500 billion from Medicare amd $1.5 trillion from Medicaid and the Obama health law, along with sweeping cuts to benefits such as federal employee pensions, food stamps and tax credits for the working poor.

But in the immediate future the GOP measure is a budget buster. It would add almost $30 billion to Trump's $668 billion request for national defense. The GOP budget plan would cut non-defense agencies by $5 billion. And of the more than $4 trillion in promised saving from mandatory programs like Medicare and Medicaid, the plan assumes just $203 billion would actually pass this year.

Bruce John Anderton

1955-2017

Bruce John Anderton, 61, passed away on July 8, 2017 in Napa, CA. Born on August 19, 1955 to Edwin Anderton and Charlotte Cappadona Anderton, he was a beloved son, brother, father, uncle, cousin and friend.

Bruce was preceded in death by his Father Edwin (Andy) Anderton, his brothers Michael James Anderton and Frank Joseph Anderton, and his companion Gretchen (Sissy) Salin. He is survived by his mother, Charlotte Mary Anderton, his sisters Kathleen Mary Paulus (Jack) and Ellen Anderton Glass (David), former spouse Teri Burr, daughter Beth Leanne Anderton, nephew Jake Anderton Paulus and niece Kristy Anderton Milton.

Bruce, a native Napan, went to St. John the Baptist Catholic School and Justin-Siena High School. In his life, he worked for Caltrans, as a Supervisor at McDonalds, as a contractor, and for Ace Hardware. All of his working environments were made better by his inventiveness and sharp-witted humor.

Bruce loved BBQing, amusement parks, laughing, music, pets, comedians, watching football, fairs, playing games, road trips, basically anything fun. Mostly, he loved making people laugh. He will be greatly missed by his family and any person who ever knew him; and there were many.

A service will be held at Claffey & Rota (1975 Main St. in Napa) on Saturday, August 5 at 1:00 p.m. In lieu of flowers or donations, please consider honoring Bruce's memory by taking a day and doing something fun with someone you love— a joy Bruce greatly valued. Memories and notes of sympathy may be shared at claffeyandrota.com.

Marty Miles

1958-2017

On Saturday, July 8th, 2017, Marty Miles passed away at his home in Napa, California at the age of 58. Marty lived in Napa over the past 30 years. He was homeless off and on while in Napa and spent many of his days visiting with community members on the streets and sidewalks. Marty was well known to many business owners and residents of Napa as a friendly and social person, always ready with a question or a story. He valued his social opportunities in the local community and became a recognizable face around town over time. A memorial service will be held at the Napa Valley Lutheran Church, 1796 Elm Street, at 12:30pm, on Tuesday, July 25th. In lieu of flowers donations can be made to local homeless shelters at Abode Services, C/O Shelter, 100 Hartle Court, Napa, 94559.

For more obituaries, please see page C6

Meredith Ann McKeown McGee

1941 – 2017

Imagine sunlight pouring in from opened drapes. That was Ann McKeown when she entered any room. Such was the case when in 1955, at age 14, Ann entered freshman home room on the first day of school, fresh from 8 years of parochial school. The Irish hooligans near where she sat were dumfounded. This ray of sunshine, homecoming queen and honor student, zipped through high school, then went to Indiana University where she became a Medical Technologist.

Before she got her degree at IU Medical Center in Indianapolis, in 1962 she became Ann McGee. She had married one of the Irish hooligans she bedazzled back in 1955. They were married in the Butler University Chapel.

As Ann McGee she became mother of Brian and Patrick. She was a fierce, don't mess with my babies, mother. She had to be, because she had to move her household 17 times in 17 years. First to Florida, back to Indiana, Mississippi, Texas (twice), California, Illinois (twice), California, with moves within cities. Amidst the chaos of boxes and confusion and grumpy kids and husband, she smiled. Morning, noon, and night she smiled. Mrs. McGee was a model U.S. Marine Corps wife.

In 1978 she moved into her beloved home in Napa, California. Soon she was Mom McGee, feeding Justin Siena football players and driving junior golfers to golf tournaments. As her boys got older she used her education to start doctors' offices, but her last job was her favorite, and where many Napans learned of her dazzling smile. That was the reception desk of Jack Woodward, DDS.

Annie Goo loved to play golf. Starter Brian Dozier would send her and two other ladies out first in the morning at Silverado in the late seventies and early eighties. Men golfers grumbled at that. When asked if the men hit into her group, she replied: "Nope. Never saw them after #2." Annie had a high handicap but played quickly and by the rules. Annie served as Women's Captain and Handicap Chairman during her 20 years at Napa Valley Country Club, circa 1986-2006. During that period, her husband was referred to as Annie Goo's husband.

Ann McGee was a volunteer. All of her endeavors can't be listed, but for over thirty years right up to her death, Ann was a volunteer at Queen of the Valley Hospital. This lady with the massive heart was part of a family of volunteers who conduct Mass every Sunday at the Queen's Chapel. She so looked forward to her Sundays. Her church friends would love to have seen Ann McKeown play the giant pipe organ in 1955 at St. Bernard's in her birth city of Crawfordsville, Indiana.

The moss didn't grow under Annie's feet, however. She traveled the world to places like Ireland (imagine that), Scotland, England, France, Australia, and Detroit (her first trip out of Indiana). She traveled the United States first in a Piper Lance and 2002-2012 she traveled in a 1955 North American T-28. Annie the aviator also enjoyed the formation, especially when she was in the slot of a four ship diamond. She said, "I like the slot because I can keep an eye on everyone". Early morning departures were her favorites when heading west for home. With her roots in the Midwest farm country, Ann marveled at the red barns being lit up by the rising sun. In her early 70's, she loved to "go jammin" in the eighteen wheeler with grandson Dustin haulin' hay.

Meredith, 3-3-41. That was her name for the last ten years, as she made doctor appointments or picked up meds. Meredith, along with amazing Dr. Ari Umutyan, fought 10 long years before the cancer from hell took her from all of us. Even in her own suffering, Meredith enjoyed making other cancer survivors smile as she comforted them. Thanks to Collabria Care for helping Meredith Ann McKeown McGee slip the surly bonds of Earth in comfort on 7-14-2007.

A friend wrote: Peace at last for you Annie. You are a memory now, but what a fine memory.

Ann was the first child of 9 of Bill and Margaret Dunn McKeown. Son Brian predeceased her. Husband Tom now tends her garden with her beloved comfort Schnauzer Zoey. Team McGee Hallock, Minnesota, consists of son Patrick, grandson Dustin, and five great-grandchildren. Granddaughter Ashley Stauffer lives in Shoshone, ID, with two great-grandchildren.

A memorial mass will be held at 2:00 p.m., Friday, July 28th at St. John the Baptist Catholic Church, 960 Caymus St., Napa CA.

Obituary policy

Deadline

Daily – Napa Valley Register

Submit by 1 p.m. for next-day publication consideration. Friday at 1 p.m. is deadline for Saturday, Sunday and Monday obituaries.

Weeklies – American Canyon Eagle, St. Helena Star, The Weekly Calistogan

Submit by 1 p.m. on Tuesday for Thursday publication consideration.

Prices

The pricing for Obituaries has changed.

Please call 707-256-2227 for more information.

To submit

Option 1: Email prepared obituary to obits@napanews.com. Include contact name, phone number and email address.

Option 2: Complete form at http://napavalleyregister.com/app/pages/vn/obit/.

Proofs

Once submission is received and processed, a text and price proof will be sent to the contact person listed in the submission.

Payment

All obituaries must be pre-paid. Our office will contact you to make arrangements. Obituaries will not run, even if submitted by deadline, if payment has not been made.

More information

Further information regarding Napa Valley Publishing obituaries is available from local funeral homes or by contacting the Classified department at (707) 226-3719 or obits@napanews.com.

Notice of Preparation Availability

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6:30 PM – 8:00 PM
American Canyon City Hall
(Council Chambers)
4381 Broadway, Suite 201
American Canyon

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6:30 PM – 8:00 PM
Petaluma Community Center
Meeting Room A-D
320 North McDowell Boulevard
Petaluma

August 10, 2017 (Thursday)
6:30 PM – 8:00 PM
Sonoma Community Center, Room 110
276 East Napa Street, **Sonoma**

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The public comment period will close at 5:00 PM on August 21, 2017. Before including your name, address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time.

Please include a name, address, and telephone number of a contact person in your agency for all future correspondence on this subject. Please send your comments to:

NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

In state blazes, local agencies feel the heat

Petaluma Fire, Rancho Adobe send resources to fight flames of busy statewide fire season

By MATT BROWN
ARGUS-COURIER STAFF

Chad Costa had a long day last Thursday. The Petaluma Fire captain assigned to a strike team, spent a 24-hour shift on the front lines of the Garza Fire, which has burned nearly 50,000 acres so far near Fresno.

The 37-year-old firefighter has been away from his wife and two kids for nearly two weeks now, having been first called to the Wall Fire near Oroville at the beginning of the month. For Costa, the summertime wildfire work means being part of a larger effort of firefighters who come together to fight the state's largest blazes.

"Basically, you never know how long you're going to be there," he said during an off day spent in a camp for firefighters near the fire line. "For me, this is a different challenge. Wildland fires are not small compared with what we deal with in Petaluma. I try and get out as much as I can as long as there is coverage back at the station."

With wildfires raging across California, Petaluma-area fire agencies are sending personnel and equipment to far flung corners of the state in a time honored tradition of mutual aid that taxes local agencies, but is increasingly necessary during particularly harsh fires seasons.

As of last week, there were more than 400 engines, 48 aircraft and more than 7,000 personnel working on a dozen wildfires that have already burned as much as 159,000 acres statewide, according to the state Office of Emergency Services.

For most of this month, the Petaluma Fire Department has had one engine and seven firefighters and paramedics on teams battling the big blazes. Rancho Adobe Fire has an additional three firefighters and an engine that has rotated between large fires in different parts of the state.

Petaluma Fire sent an engine assigned to the county Office of Emergency Services and four personnel to the Alamo Fire, a nearly 30,000-acre wildfire in San Luis Obispo. An additional firefighter and two paramedics were assigned to so-called overhead teams at the Wall Fire, which burned 6,000 acres in Butte County.

Zack Brown and Matt Patterson, fire line medics, went to the Wall Fire, and Costa served as strike team leader on the fire before moving to the Garza Fire in Kings County. The engine sent to the Alamo Fire included Captain Gary Giusti, Engineer Mac Thompson, Firefighter Dan Connelly and Firefighter/Paramedic Jason Engh.

Battalion Chief Dave Kahn said that the department's first responsibility is to protect Petaluma, but the agency will answer the call for mutual aid if it has the resources to spare.

"Nobody has enough resources to take care of everything," he said. "We all have to pitch in and take care of each other when big events happen."

He said that the state will reimburse Petaluma for costs associated with fighting outside fires. This year has been particularly brutal for wildfires. A four year drought created lots of dead, flammable material. Heavy, drought-busting winter rains caused an explosion of new growth, which has turned brown as the summer heats up.

Rancho Adobe sent an engine as part of a strike team, along with Captain Jimmy Bernal, Engineer Tim Henry and Engineer Chris Foss. They originally deployed to the Wall Fire on July 8, but then got called to the Garza Fire, according to Captain Tim Caldwell.

He said that the crews can work 12 to 24 hour shifts, and it is demanding physical labor, often times involving long treks into hilly terrain and cutting fire lines by hand.

"It's very taxing on the crews," he said. "They are in a very hot area that burns rapidly."

With local agencies stretched thin, Caldwell said other area fire departments stand ready to help their neighbors. Local agencies also cover for CalFire stations when the state firefighters are away battling blazes.

"That's mutual aid," he said. "We'll assist as long as we can."

(Contact Matt Brown at matt.brown@arguscourier.com.)

PHOTOS COURTESY OF CHAD COSTA/ PETALUMA FIRE

A strike team from Sonoma County, including crews from Rancho Adobe, Santa Rosa, Cloverdale, Sonoma Valley and Forestville, helped fight the Wall fire near Oroville.

A Sonoma County strike team that included firefighters from Rancho Adobe and Petaluma was sent to the Wall fire near Oroville.

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NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

HOMES

CONTINUED FROM A1

Keller Williams Realty in Santa Rosa. Home sales have fallen for three of the past four years.

The county's housing market continues to be characterized by rising prices, declining sales and tight inventory.

Home prices here have climbed for more than five years.

The increases occurred after median prices plummeted in the midst of a national housing crisis and Great Recession, hitting a low here of $305,000 in February 2009.

Prices began to rise in 2012. The county in March surpassed its previous record median price — not adjusted for inflation — of $619,000 set in August 2005.

Purchasing a home in the region today requires considerable savings and income.

The buyer of a median-priced home in the Bay Area would need to put down roughly $105,000 for a 10 percent down payment and closing costs, said Scott Sheldon, branch manager at New American Funding in Santa Rosa. With a 30-year fixed loan at 4.375 percent, the mortgage would require monthly payments, including taxes and insurance, of $5,435, and the buyer would need a household income of $152,000 a year.

The real estate association estimated Tuesday that only 25 percent of county households and only 21 percent of Bay Area households could afford the respectively median-priced homes in June.

For the county's median-price property, a buyer with 20 percent down would need a minimum income of $123,527 in order to afford monthly payments of $3,088, the association calculated. June ended with fewer than 830 single-family homes available for sale in the county, or less than two months of inventory at the current pace of sales.

For the first six months of the year, the number of newly listed properties for sale declined 5 percent from the same period in 2016 and amounted to the lowest total in at least eight years.

With such a limited supply of homes, buyers must be ready to make their best offer when a new property becomes available, agents and brokers said.

"As soon as those listing come on, you have to move," said David Corbin, broker with HomeSmart Advantage Realty in Santa Rosa.

"You can't wait a day or two."

Sellers, meanwhile, continue to draw strong interest from buyers in many price segments, agents said.

Multiple offers are common for houses selling below $550,000, and sales have increased significantly for homes selling above $1 million.

Trish McCall, an agent with Keller Williams Realty in Santa Rosa, said interest remains strong for move-up homes, especially single-story houses with about 1,800 to 2,100 square feet of space and situated on larger lots in nice neighborhoods.

Such homes appeal both to families on the hunt for more room and to affluent empty nesters looking to downsize from even larger properties.

Last month McCall listed two such homes next door to one other in northeast Santa Rosa, each priced in the $800,000s.

After crowded open houses, "they both were in contract within 12 hours," she said. The accepted offers for both properties exceeded the asking prices.

Belinda Andrews, a broker associate with Century 21 in Santa Rosa, said she talks regularly with young people who question whether they can afford to remain in Sonoma County.

Some put down roots, others work here but commute in from outside the county and still others leave.

As both rents and home prices continue to rise, Andrews said, more residents inevitably will ask, "Is living in this area worth it? I think a lot of people are going to say, 'No, it's not worth it.'"

You can reach Staff Writer Robert Digitale at 707-521-5265 or robert.digitale@pressdemocrat.com. On Twitter @rdigit

MANUEL BALCE CENETA / ASSOCIATED PRESS

Protesters against the Republican health care bill gather inside the office of Sen. Rob Portman, R-Ohio, on Capitol Hill in Washington on Monday.

HEALTH

CONTINUED FROM A1

feat for congressional Republicans and for President Trump, who had pledged to roll back the Affordable Care Act on "Day One" of his presidency.

It also leaves millions of consumers who receive health insurance through the law in a kind of administrative limbo, wondering how their care will be affected now that the program is in the hands of government officials who have rooted openly for its demise.

On Tuesday, Trump told reporters in the White House's Roosevelt Room that he now plans to "let Obamacare fail. It will be a lot easier." That way, he said, his party would bear no political responsibility for the system's collapse.

"We're not going to own it. I'm not going to own it," the president said. "I can tell you the Republicans are not going to own it. We'll let Obamacare fail, and then the Democrats are going to come to us" to fix it.

But Trump's comments appeared to ignore the many Republican lawmakers who are anxious about depriving their constituents of federal benefits on which they now rely. The president invited all 52 Republican senators to join him for lunch Wednesday at the White House to try to get the repeal effort back on track.

Senate leaders have been struggling to devise a plan to overhaul Obamacare since the House passed its version of the legislation in May, a flawed bill that some House members openly invited the Senate to fix. With just 52 seats, McConnell could afford to lose the support of only two members of his caucus — and even then would rely on Vice President Pence to break the tie.

The measure he produced would have scaled back key federal insurance regulations and slashed Medicaid deeply over time. But it did not go far enough for many conservative Republicans, who wanted to roll back more of the ACA's mandates on insurers.

And the bill went much too far for many moderates, especially Republicans from states that had taken advantage of the ACA's offer to expand Medicaid eligibility. The bill would have cut Medicaid funding and phased out its expansion in 31 states and the District of Columbia. Some senators worried that their states would be saddled with the unpalatable choice of cutting off people's health coverage or shouldering a massive new financial burden.

"This is the Senate. Leadership sets the agenda, but senators vote in the interests of their states," said Sen. Marco Rubio, R-Florida.

Sen. Orrin Hatch, R-Utah, offered a blunt assessment of why the effort fell short: "We are so evenly divided, and we've got to have every Republican to make things work, and we didn't have every Republican," he said.

Two Republicans — Collins, a moderate, and conservative Sen. Rand Paul, Kentucky — declared late last week that they could not support the latest version of the bill. Late Monday night, as six of their colleagues talked health care strategy with Trump over dinner at the White House, conservative Sens. Mike Lee, R-Utah, and Jerry Moran, R-Kansas, announced that they, too, would oppose the bill, and the measure was dead.

Key Republicans held out hope that the effort could be revived. House Speaker Paul Ryan, R-Wisconsin, said Tuesday that he "would like to see the Senate move on something" to keep the repeal-and-replace process alive.

Notice of Preparation Availability

North Bay Water Reuse Authority to Host Public Meetings in Preparation for Proposed Recycled Water Projects

The North Bay Water Reuse Authority (NBWRA) is a cooperative program in the San Pablo Bay region that supports sustainability and environmental enhancement by expanding the use of recycled water. The NBWRA is proposing Phase 2 of the North Bay Water Reuse Program to continue increasing the beneficial use of recycled water. Sonoma County Water Agency (Water Agency) will act as Lead Agency under the California Environmental Quality Act (CEQA) for preparing an Environmental Impact Report (EIR). The Department of Interior, Bureau of Reclamation, will be the federal Lead Agency under the National Environmental Policy Act (NEPA) for preparing an Environmental Impact Statement (EIS).

Consistent with Section 15082 of the CEQA Guidelines, a Notice of Preparation (NOP) has been prepared describing the proposed project and identifies issue areas to be examined in the EIR/EIS. Agencies and interested members of the public are invited to provide input on the scope of the environmental analysis. In keeping with Water Agency's Sustainability Program, the NOP is available to the public on the web page identified below. Printed copies of the NOP are available at each of the member agency offices or are available upon request by emailing Phase2EIR@nbwra.org. Public Scoping Meetings will be held in American Canyon, Petaluma, San Rafael, and Sonoma. For more information, please visit **www.nbwra.org**.

The projects proposed in the Phase 2 Program would continue to build upon commitments to long-term inter-agency cooperation to address common needs related to reliable water supplies and enhanced environmental restoration. These projects would include construction and operation of treatment capacity improvements, distribution facilities, and storage facilities (seasonal and operational) to provide recycled water environmental, agricultural, and municipal reuse in the North San Pablo Bay region, which encompasses approximately 318 square miles in Marin, Sonoma and Napa counties. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing wastewater treatment plants. This recycled water would be used in a manner consistent with the California Code of Regulations, Title 22, pertaining to the use of tertiary-treated recycled water.

A series of four scoping meetings will be held within the collective NBWRA service area during the NOP review period. (The same content will be presented at each meeting.) The scoping meetings will be held on the following dates:

August 2, 2017 (Wednesday)
6:30 PM – 8:00 PM
San Rafael Community Center Auditorium
618 B Street, **San Rafael**

August 3, 2017 (Thursday)
6:30 PM – 8:00 PM
American Canyon City Hall
(Council Chambers)
4381 Broadway, Suite 201
American Canyon

August 9, 2017 (Wednesday)
6:30 PM – 8:00 PM
Petaluma Community Center
Meeting Room A-D
320 North McDowell Boulevard
Petaluma

August 10, 2017 (Thursday)
6:30 PM – 8:00 PM
Sonoma Community Center, Room 110
276 East Napa Street, **Sonoma**

If you have a disability which requires an accommodation, an alternative format, or requires another person to assist you while attending these meetings or reviewing associated materials, please contact the Water Agency at 707-524-8378 as soon as possible to ensure arrangements for accommodation.

The public comment period will close at 5:00 PM on August 21, 2017. Before including your name, address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time.

Please include a name, address, and telephone number of a contact person in your agency for all future correspondence on this subject. Please send your comments to:

NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

North Bay Water Reuse Authority to host public meetings in preparation for **proposed recycled water projects**

FOR IMMEDIATE RELEASE
July 20, 2017

Contact:
Brad Sherwood
Community & Government Affairs
707-322-8192
Brad.Sherwood@scwa.ca.gov

North Bay Water Reuse Program – The North Bay Water Reuse Authority (NBWRA) is proposing Phase 2 of the North Bay Water Reuse Program to continue increasing the beneficial use of recycled water.

Santa Rosa, CA. — The North Bay Water Reuse Program, in preparation for their proposal of Phase 2 recycled water projects, will host four public information meetings focused on the scope of environmental analysis.

The projects proposed in the Phase 2 Program would continue to build upon commitments to long-term inter-agency cooperation to address common needs related to reliable water supplies and enhanced environmental restoration.

These projects would include construction and operation of treatment capacity improvements, distribution facilities, and storage facilities (seasonal and operational) to provide recycled water environmental, agricultural, and municipal reuse in the North San Pablo Bay region, which encompasses approximately 318 square miles in Marin, Sonoma and Napa counties. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing wastewater treatment plants. This recycled water would be used in a manner consistent with the California Code of Regulations, Title 22, pertaining to the use of tertiary-treated recycled water.

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Petaluma Community Center, Meeting Room A-D
320 North McDowell Boulevard, Petaluma

August 10, 2017 (Thursday)
6:30 PM – 8:00 PM
Sonoma Community Center, Room 110
276 East Napa Street, Sonoma

For more information, visit www.nbwra.org

To contact NBWRA email info@nbwra.org or call (707) 235-8965.

APPENDIX D

Scoping Meeting Materials & Attendance Sheets

Following is a list of attendees at the four NBWRA scoping sessions.

	August 2, 2017, San Rafael	**August 3, 2017, American Canyon**	**August 9, 2017, Petaluma**	**August 10, 2017, Sonoma**
Elected Officials/NBWRA Board Members	Jack Gibson, MMWD Larry Russell, MMWD	None	David Rabbitt, Sonoma County and NBWRA Chair	None
Member Agency Staff	Anne Crealock, SCWA Kevin Booker, SCWA	Jessica Martini-Lamb, SCWA Steve Hartwig, American Canyon	Jessica Martini-Lamb, SCWA Kevin Booker, SCWA Leah Walker, Petaluma	Anne Crealock, SCWA Kevin Booker, SCWA Marcus Trotta, SCWA Jay Jasperse, SCWA
Consultants	Chuck Weir, NBWRA PM Jim O'Toole, ESA Dave Davis, ESA Maria Hensel, ESA Robin Gordon, Data Instincts	Chuck Weir, NBWRA PM Jim O'Toole, ESA Dave Davis, ESA Robin Gordon, Data Instincts	Chuck Weir, NBWRA PM Jim O'Toole, ESA Dave Davis, ESA Maria Hensel, ESA Mark Millan, Data Instincts	Chuck Weir, NBWRA PM Jim O'Toole, ESA Dave Davis, ESA Maria Hensel, ESA Mark Millan, Data Instincts Tim Parker, Consultant to SCWA
Public	Susan Stompe, Marin Conservation League	None	None	None

SIGN-IN SHEET
NBWRA Phase 2 NOP Scoping Meeting
August 2, 2017
San Rafael Community Center Auditorium

NAME/ORGANIZATION (Please Print)	STREET ADDRESS (No. & Street/P.O. Box)	CITY	ZIP CODE	PHONE NO.	E-MAIL ADDRESS (To receive project updates)
Jack Gibson	MMWD				
Lou Russo	MMWD				
Susan Stompe	110 San Mateo	Novato	94945		SSStompe@aol.com

SIGN-IN SHEET
NBWRA Phase 2 NOP Scoping Meeting
August 3, 2017
American Canyon City Hall

NAME/ORGANIZATION (Please Print)	STREET ADDRESS (No. & Street/P.O. Box)	CITY	ZIP CODE	PHONE NO.	E-MAIL ADDRESS (To receive project updates)
None 8/3/17 DDD					

SIGN-IN SHEET
NBWRA Phase 2 NOP Scoping Meeting
August 9, 2017
Petaluma Community Center

NAME/ORGANIZATION (Please Print)	STREET ADDRESS (No. & Street/P.O. Box)	CITY	ZIP CODE	PHONE NO.	E-MAIL ADDRESS (To receive project updates)
No attendees 8/9/17 DDD					

SIGN-IN SHEET
NBWRA Phase 2 NOP Scoping Meeting
August 10, 2017
Sonoma Community Center

NAME/ORGANIZATION (Please Print)	STREET ADDRESS (No. & Street/P.O. Box)	CITY	ZIP CODE	PHONE NO.	E-MAIL ADDRESS (To receive project updates)
TIM PARKER	434 BUNKHOUSE	SACTO	95831	916 596-9163	TIM@PS-tm.com

North Bay Water Reuse Program

NBWRA North Bay Water Recycling Program – Phase 2

EIR/EIS
Public Scoping Meeting Series
August, 2017

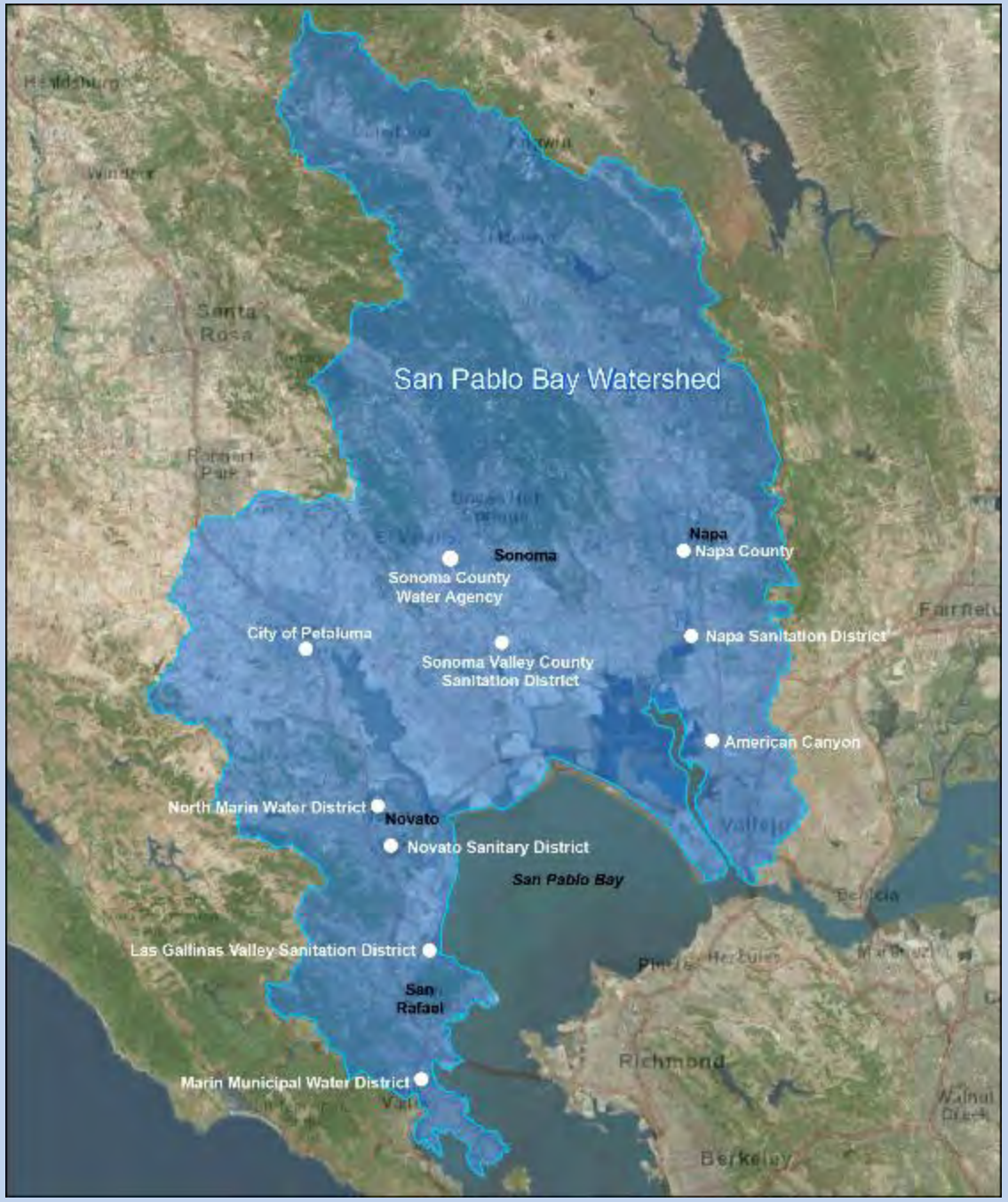
NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Scoping Meeting

- PURPOSE:
  - Provide Overview of Project Description and Opportunity for Public Comment on Analysis

- AGENDA:
  - Introductions
  - Background of NBWRA
  - Project Description Overview
  - Anticipated Analysis Overview
  - Public Comment

North San Pablo Bay Watershed



The Problem: Water Supply Challenges

- Area has long depended on surface water – rivers, lakes, streams – and groundwater
- Surface water supplies are limited and subject to drought year fluctuation
- Some groundwater basins are over-pumped, harming water levels and quality

The Problem: Environmental Challenges

- A source of clean reliable water supply is needed to continue restoration of tidal wetlands in San Pablo Bay
- Treated wastewater discharged to the Bay is subject to seasonal and operational limits

Why NBWRA Was Formed in 2002

Public agencies in the region have been seeking a solution to the water challenges:

- A water supply that can supplement surface water supplies to increase seasonal and dry year reliability
- Highest and best use for highly treated wastewater
- Multi-benefit approach to urban, agricultural and environmental needs
- All at reasonable cost

NBWRA Member and Supporting Agencies

Member Agencies: Phase 2

- Napa Sanitation District
- Sonoma Valley County San. District
- Sonoma County Water Agency
- Novato Sanitary District
- City of Petaluma
- City of American Canyon
- Marin Municipal Water District

Supporting Agencies

- Marin County
- Napa County
- North Marin Water Dist.
- Las Gallinas San Dist.

NBWRA's Phase 1 Complete!

- Participation with Bureau of Reclamation
  - Title XVI Program provided 50% Matching Funds for Feasibility Study and 25% Match for Construction
- Feasibility Study and EIR/EIS Prepared
- Phase I Program Completed
  - 6.4 mgd tertiary treatment capacity
  - 46 miles of pipelines and distribution
  - Delivery of 3,757 AFY for irrigation, Napa Salt Pond 7A restoration

NBWRA Phase 2 Program

- Board of Directors Formed
- Identification of New Member Agencies
  - Marin Municipal Water District
  - Cities of Petaluma and American Canyon
- Feasibility Study for Phase 2 Prepared
- Reviewed and Approved by Reclamation under Title XVI Program

How does NBWRA relate to Sonoma County?

- NBWRA Member Agencies in Marin, Sonoma and Napa Counties working together to:
  - Carry out engineering and environmental work that considers regional opportunities and local projects
  - Funding for Feasibility Study through Title XVI Program
- Focus of Scoping Meeting is North Bay Water Reuse Program – Phase 2
  - Petaluma and Sonoma Valley Projects are a subset of the Phase 2 Program

North Bay Water Reuse Program

Project Objectives

- Improve local, regional, and State water supply reliability;
- Offset demands on potable water supplies;
- Address impaired groundwater basins;
- Enhance local and regional ecosystems;
- Maintain and protect public health and safety;
- Promote sustainable practices; and
- Implement integrated water management in an economically viable manner.

NEPA/CEQA Review

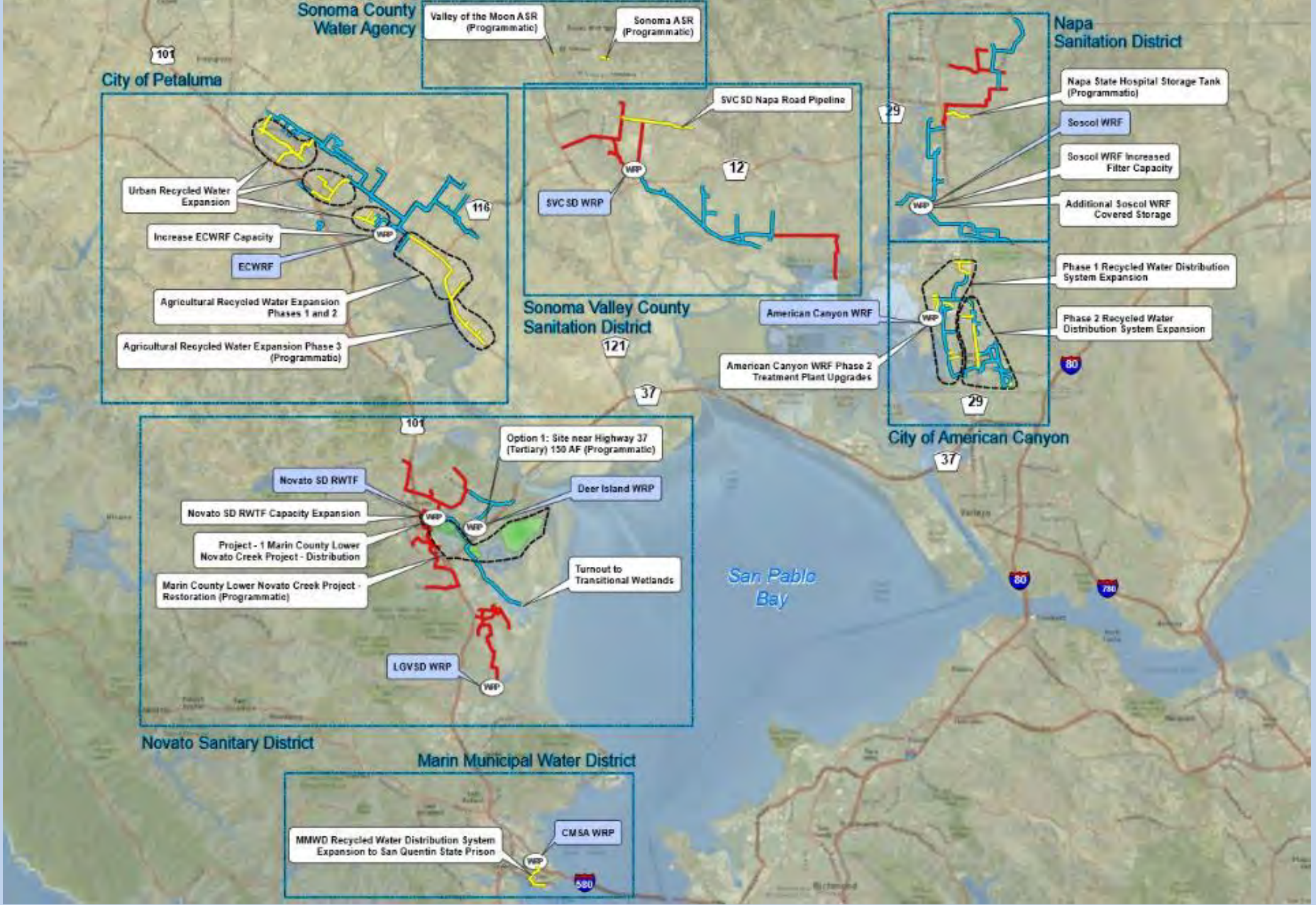
- NEPA: National Environmental Policy Act
  - Required for Federal Funding from Bureau of Reclamation
  - Bureau of Reclamation: NEPA Lead Agency
- CEQA: California Environmental Quality Act
  - Required for Member Agencies to approve projects
  - Sonoma County Water Agency will act as CEQA Lead Agency for NBWRA

Project vs. Program Level Analysis

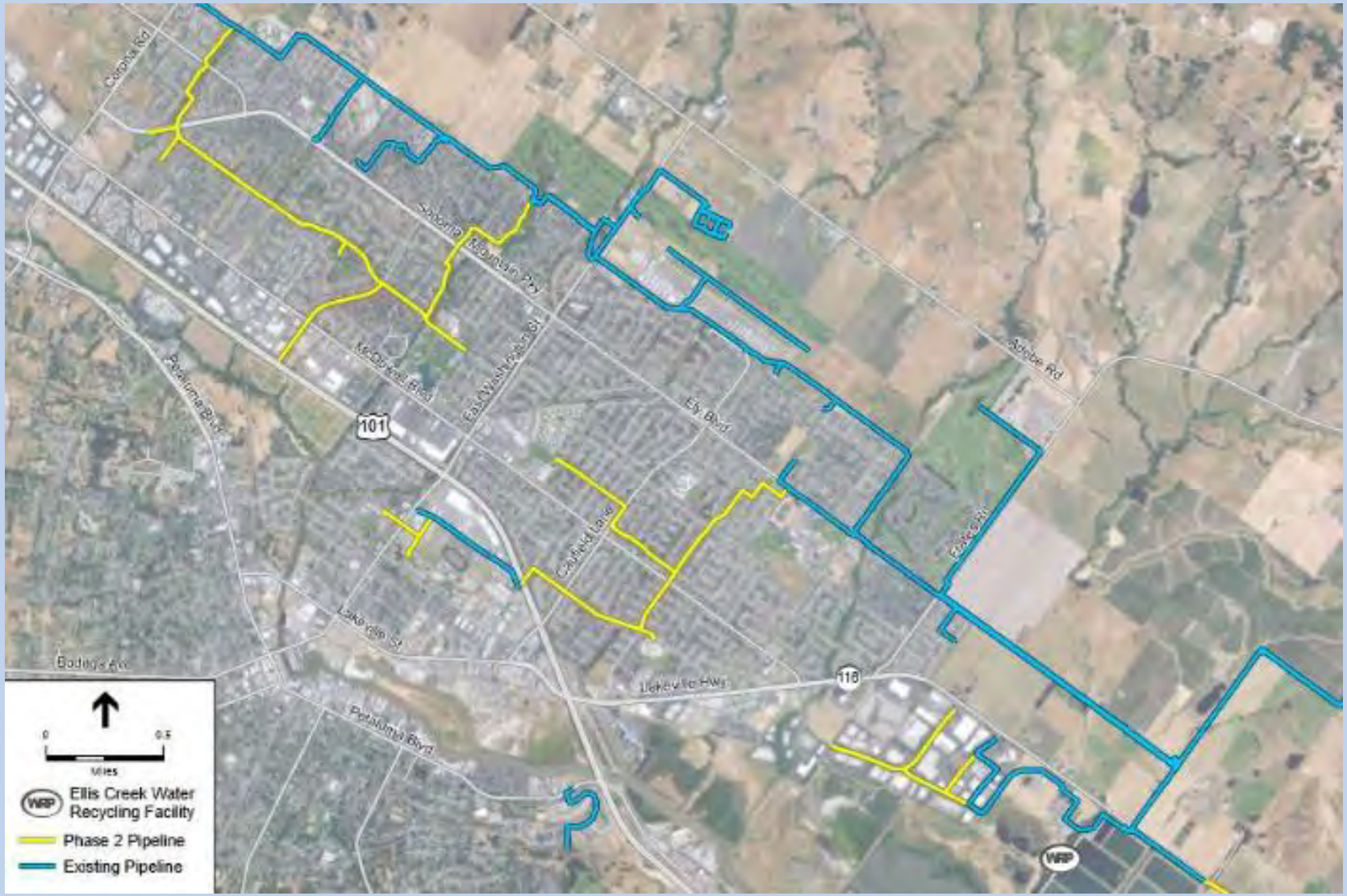
- Project Level Analysis:
  - Projects that have been identified by Member Agencies and developed in their Master Plans
  - Will be examined at project level of analysis, allowing for approval and eventual construction
- Program Level of analysis
  - Future CEQA review would be required for their implementation
  - Provides Mitigation Framework for future implementation

Summary of NBWRA Phase 2

Participants	Project Summary	Facilities	Notes
Project Level			
Novato San District	Increased tertiary treatment capacity, wetland enhancement irrigation	0.85 mgd 1.12 mi pipeline	• 4,904 afy recycled water • 20.6 miles new pipelines • 10.2 AF new storage • 4.8 mgd new WWTP capacity
Sonoma Valley County San District	Increased distribution in Sonoma Valley	2.2 mi pipeline	
MMWD	Recycled Distribution to San Quentin Prison	0.2 mgd 1.1 mi pipeline	
Napa San District	Increased Soscol WWTP tertiary capacity and covered storage	1.7 mgd	
Petaluma	Increased ECWRF Capacity, Urban Recycled Water System, Agricultural Recycled Water System	2.1 mgd 11.4 mi pipeline	
American Canyon	WRF Treatment Plant Upgrades, Recycled Water Distribution System Expansion	4.7 mi pipeline	
Program Level			
Novato San District	Seasonal Storage, Environmental Enhancement	150 AF Lower Novato Creek	
City of Petaluma	Agricultural Recycled Water Phase 3	2.14 mi. pipeline	
Napa San District	Operational Storage Tank	Napa State Hospital Storage Tank	
SCWA	Potable Water Aquifer Storage and Recovery (ASR)	Valley of the Moon ASR, Sonoma ASR	


Sonoma County Water Agency
Valley of the Moon ASR (Programmatic)
Sonoma ASR (Programmatic)
City of Petaluma
Urban Recycled Water Expansion
Increase ECWRF Capacity
ECWRF
Agricultural Recycled Water Expansion Phases 1 and 2
Agricultural Recycled Water Expansion Phase 3 (Programmatic)
SVCSD Napa Road Pipeline
SVCSD WRP
Sonoma Valley County Sanitation District
Napa Sanitation District
Napa State Hospital Storage Tank (Programmatic)
Soscol WRF
Soscol WRF Increased Filter Capacity
Additional Soscol WRF Covered Storage
American Canyon WRF
American Canyon WRF Phase 2 Treatment Plant Upgrades
Phase 1 Recycled Water Distribution System Expansion
Phase 2 Recycled Water Distribution System Expansion
City of American Canyon
Option 1: Site near Highway 37 (Tertiary) 150 AF (Programmatic)
Novato SD RWTF
Novato SD RWTF Capacity Expansion
Project - 1 Marin County Lower Novato Creek Project - Distribution
Marin County Lower Novato Creek Project - Restoration (Programmatic)
Deer Island WRP
Turnout to Transitional Wetlands
LGVSD WRP
Novato Sanitary District
San Pablo Bay
Marin Municipal Water District
MMWD Recycled Water Distribution System Expansion to San Quentin State Prison
CMSA WRP

Petaluma Urban Recycled System

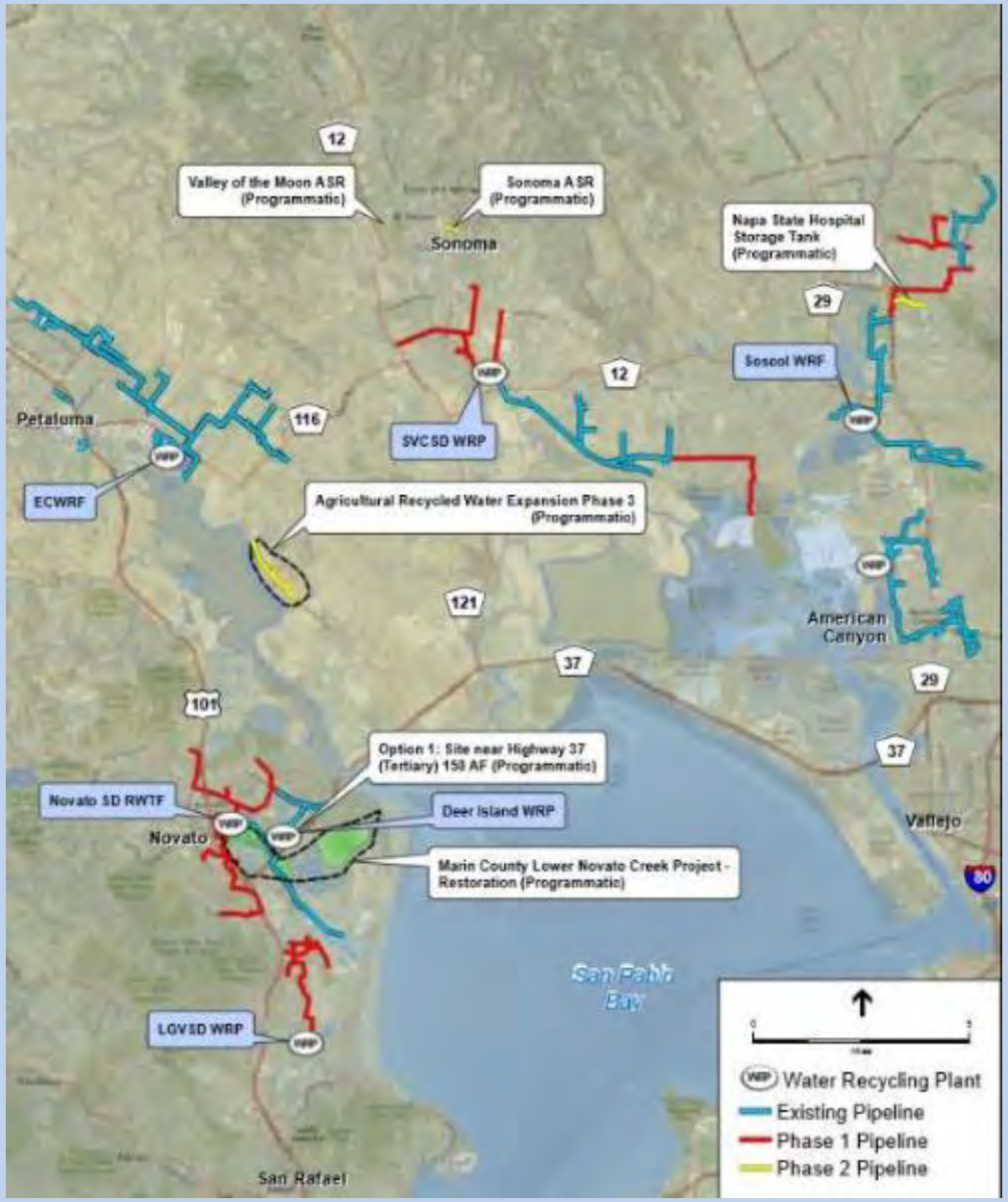


Petaluma Recycled Agricultural System

Program Level Projects:

- Marin Co. Lower Novato Creek
- Novato San District Storage
- Petaluma Ag – Phase 3
- Aquifer Storage/Recovery
  - Sonoma/Valley of the Moon
- Napa Storage Tank
- American Canyon

  Green Island Road Area Pipes



EIR/EIS Analysis Areas:

- Aesthetics
- Land Use/Planning
- Mineral Resources
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities/Service Systems
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural/Tribal Resources
- Geology/Soils
- Hazardous Materials
- Hydrology/Water Quality
- Socioeconomics
- Environmental Justice

- EIR/EIS Analysis: Establish Performance Standards and Mitigation Framework

Water Quality

EIR/EIS Will Review:

- Potential short-term impacts of construction
  - Potential impacts to surface and groundwater quality
- Regulatory Setting for Recycled Water Use
- Potential direct and indirect effects to surface and groundwater quality associated with use:
  - Salinity, nutrient loading
  - Direct and indirect effects to receiving waters at discharge points

Water Quality/Public Health

- Recycled Water Use and Water Quality
  - Tertiary Treatment
  - Regulated by Title 22 of California Code
    - Establishes treatment processes and appropriate uses
- Micro-constituents
  - Are not new, increasing, or emerging
  - What is Changing? Ability to detect trace organic compounds at extremely low levels
  - No epidemiological studies that show human health impacts due to recycled water use

Biological Resources

EIR/EIS Will Review:

- Species within project area and potential for:
  - Direct Impacts due to construction
  - Indirect impacts due to operations

- Identify Appropriate Measures
  - Pre-construction surveys, avoidance/minimization, restoration, agency coordination, compensatory mitigation as appropriate.

Cultural Resources/Tribal Resources

- Cultural Resources Report underway
  - AB 52 Consultation with Native American Tribes
  - Database, Native American consultation, field reconnaissance
  - Identifies known cultural resource occurrences
- Will be integrated into EIR/EIS analysis
- Mitigation Measures will be identified as appropriate
  - Pre-construction surveys, monitoring
  - Establishment of Cultural Resources Management Plan in the event of discovery

Construction Impacts

EIR/EIS will review:

- Short-Term Construction-related Impacts
  - Noise, Dust Generation, Visual Resources, Traffic, Water Quality
- EIR/EIS will identify Best Management Practices (BMPs) as mitigation measures
- Minimize short-term impacts

Operational Impacts

EIR/EIS will review:

- Long-Term Operational Impacts
  - Air Quality, Visual Resources, Chemical Use, Traffic Trips
  - Greenhouse gas emissions, Water Supply, Water Quality
- EIR/EIS will identify Best Management Practices (BMPs) to address individual issue areas and minimize long-term effects

Environmental Justice

EIR/EIS will review:

- Minority/low-income populations that may be affected by project
- Review whether such populations are disproportionately affected by project

Secondary Effects of Growth

EIR/EIS will review:

- Regional ABAG and Local General Plans
- Relationship between recycled water and:
  - General Plan Buildout of Urban Uses
  - Agricultural Land Uses
- Review regional plans and mitigation programs

Other CEQA/NEPA Impacts

- Cumulative Impacts:
  - Cumulative effects when considered with other projects
- Energy and Depletable Resources
- Irreversible Commitment of Resources
- Indian Trust Assets
- Compliance with Executive Orders

How do I comment on the NOP?

- NOP Comment Period: Closes August 21st, 2017
  - Attend Scoping Meetings
  - Comment Cards Available
  - Online Comment Form available at:
    - www.nbwra.org
  - Mail Written Comments Directly to:

    Anne Crealock
    Sonoma County Water Agency
    404 Aviation Boulevard
    Santa Rosa, CA 95403

Public/Agency Scoping Comments

NORTH BAY WATER REUSE PROGRAM

Water Supply Reliability through Regional Reuse

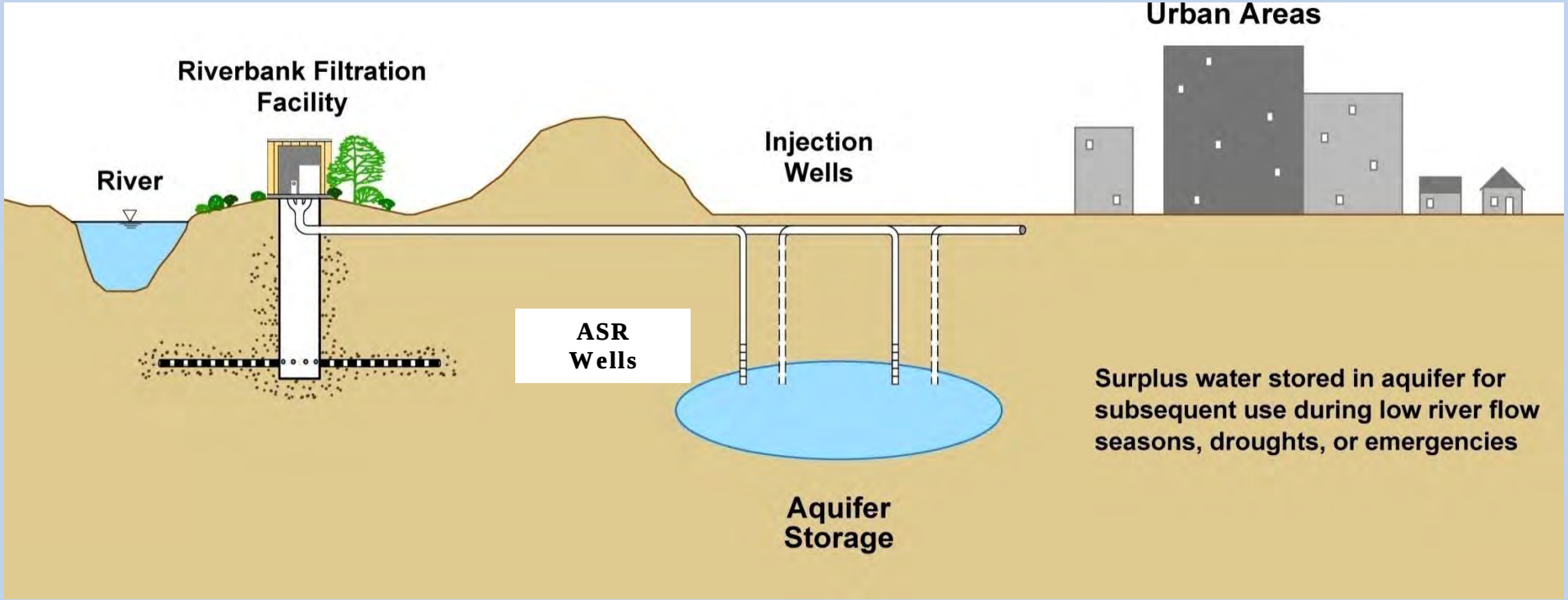
Other Phase 2 Projects

NORTH BAY WATER REUSE PROGRAM

Water Supply Reliability through Regional Reuse

Sonoma Valley CSD Napa Road Pipeline

Program Level Projects: Valley of the Moon and City of Sonoma ASR Wells

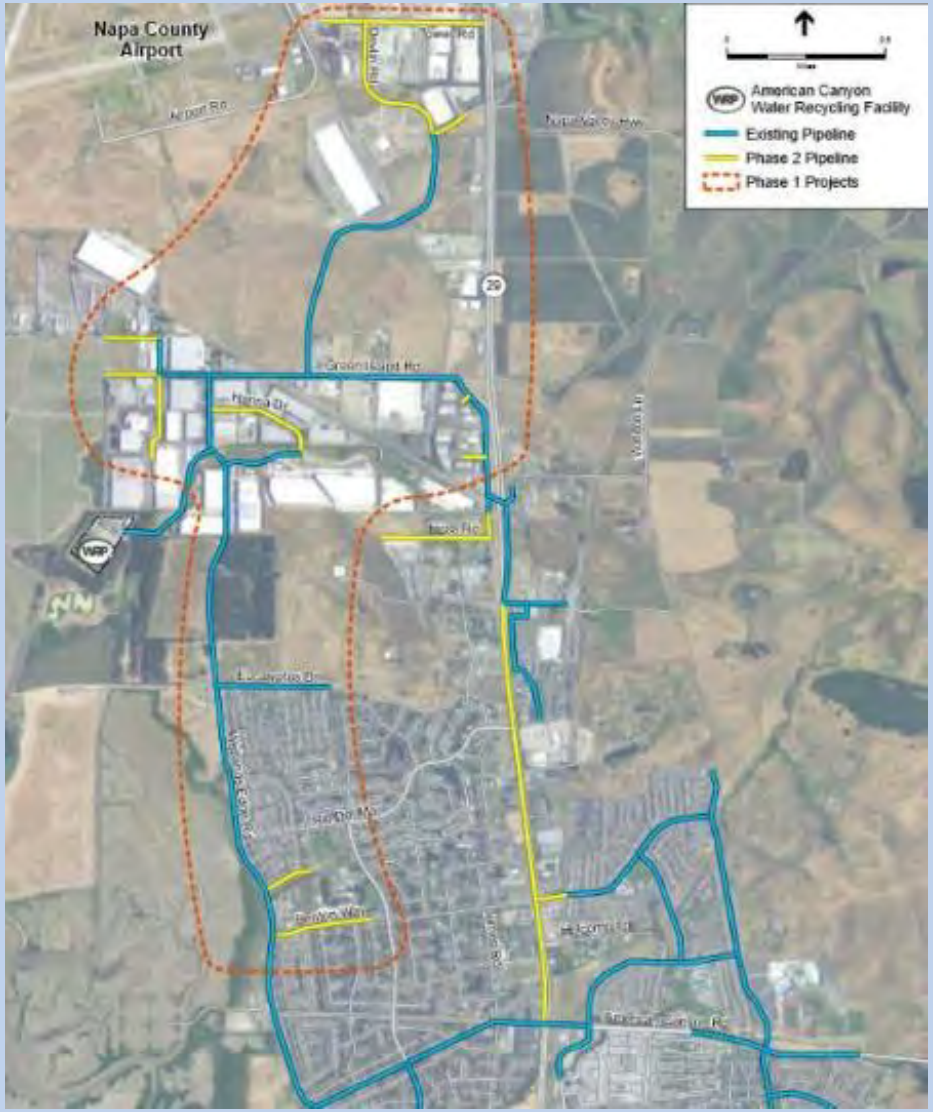


NORTH BAY WATER REUSE PROGRAM
Water Supply Reliability through Regional Reuse

Novato San WWTP Tertiary Upgrade and Wetland Enhancement

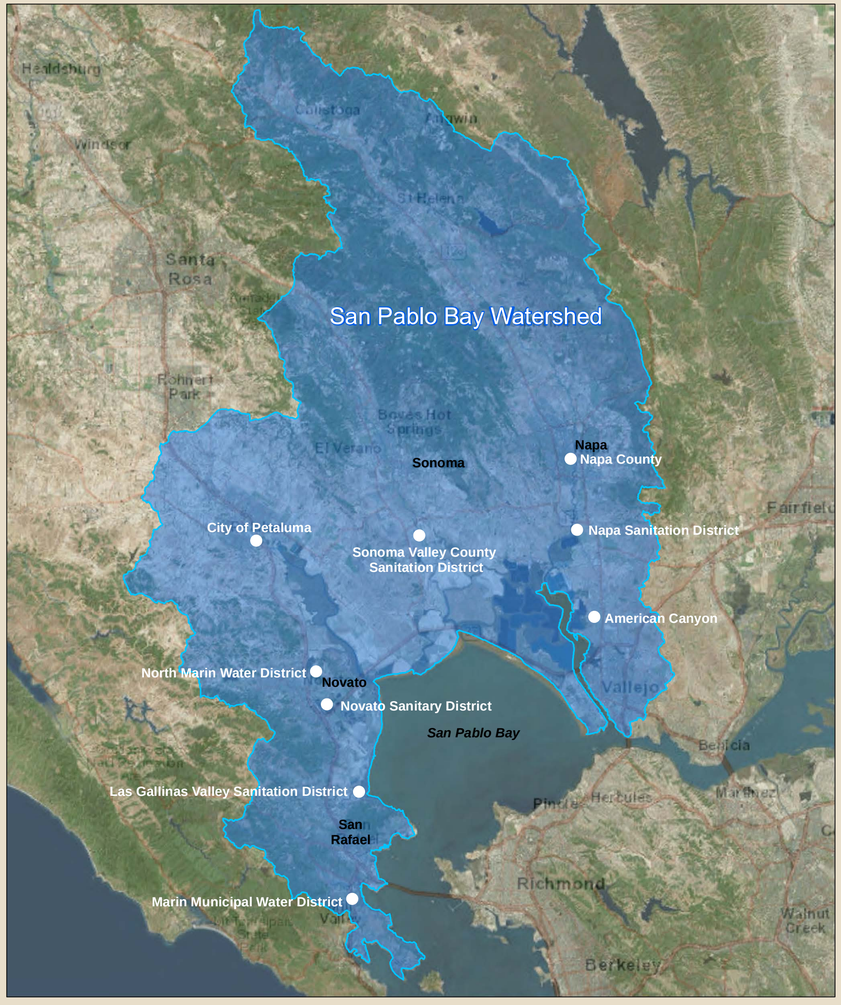
MMWD
San Quentin Recycled Water Pipeline

American Canyon Pipelines



American Canyon Pipelines

NBWRA: INCREASING WATER RECYCLING AROUND THE NORTH SAN PABLO BAY



NORTH BAY WATER REUSE PROGRAM

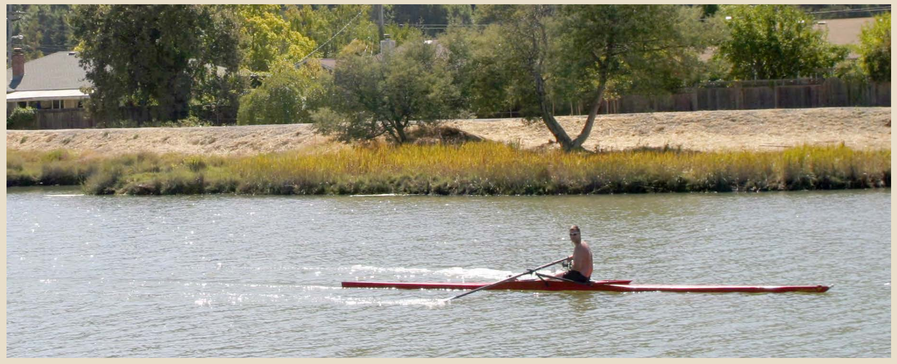
Expanding Water Supplies with Regional Reuse

Benefits of the Proposed Water Recycling Program

- Provides reliable source of water for parks, golf courses, public landscaping
- Increases water supply for restoration of wetland and riparian habitat, as well as fisheries
- Assures reliable water supply for agriculture
- Reduces demand on limited water supplies
- Reduces discharge of treated wastewater into the Bay and rivers
- Increases access to grant funds through regional cooperation

NBWRA Funding

Grants have been received as a 50% cost share towards engineering studies. NBWRA is working to obtain a 25% matching grant towards $68 million in project costs. The federal matching funds would be applied to any of the alternatives.

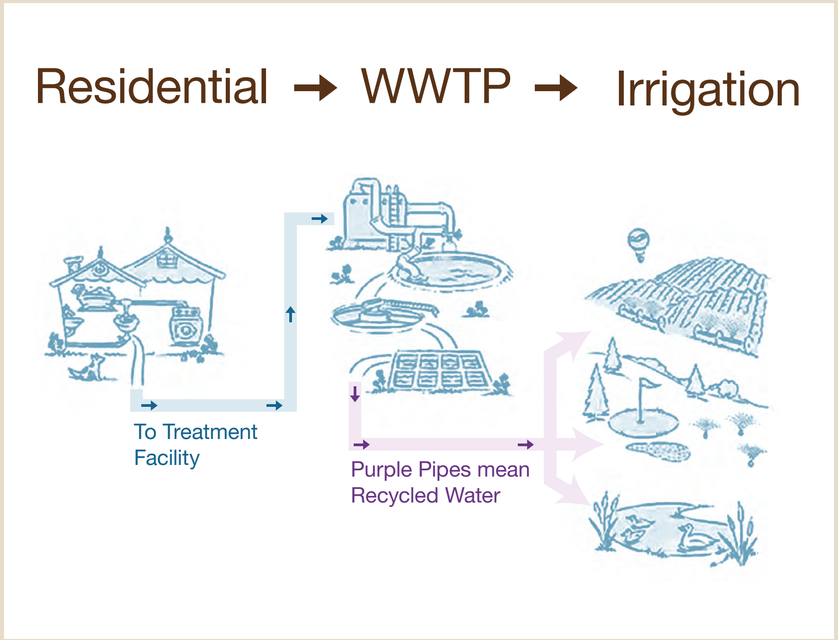


Recycled water is a smart and sustainable use of local resources.

In the same way that recycling paper, metals and plastics just makes sense, using high-quality recycled water is another beneficial form of conservation.

The North Bay Water Reuse Program is the right solution for our communities and the environment.

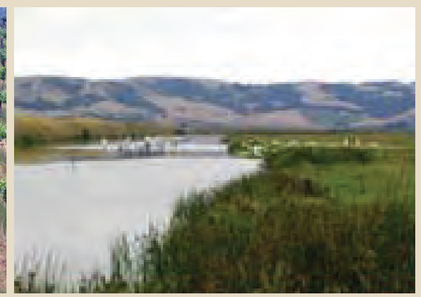
RECYCLED WATER TREATMENT AND USES



Approved Uses of Tertiary Recycled Water – Title 22 Recycling Criteria (Partial List)

Irrigation of:

- Parks and playgrounds
- School yards
- Residential landscaping
- Cemeteries
- Freeway landscaping
- Surface irrigation of orchards and vineyards
- Landscape impoundments
- Wetlands, wildlife habitat, stream augmentation
- Industrial cooling processes
- Landscape and golf course irrigation
- Food crop irrigation

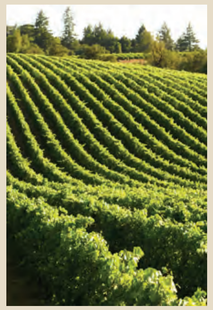


NORTH BAY WATER REUSE PROGRAM
Expanding Water Supplies with Regional Reuse

WATER REUSE IN THE STATE

Agriculture

- Currently, California farmers use about 250,000 acre-feet (AF) of recycled water annually.
- 187,195 AF of recycled water have been used on 61,553 acres of farm and ranch lands.
- 52 different crops being grown with the help of recycled water.



Recycled water has been used for a number of years to irrigate vineyards at California wineries, and this use is growing. Recently, Gallo Wineries and the City of Santa Rosa completed facilities for the irrigation of 350 acres of vineyards with recycled water from the Santa Rosa Subregional Water Reclamation System.

Environment and Recreation

- Recycled water has helped in the development of recreational lakes, marsh enhancement, and stream flow augmentation. It also can be impounded for urban landscape development. In 1987, about 10,000 AF of recycled water were used for such purposes. By 2011, the volume had increased to more than 55,000 AF used for recreational impoundment and wildlife habitat enhancement.

Groundwater Recharge

- Recycled water has been used to recharge aquifers since 1970s
- Groundwater recharge including protection against salt-water intrusion accounts for approximately 12 percent of all recycled water annually.

Industry

- The use of recycled water in industry has increased from about 6,000 AF per year in 1987 to more than 47,000 AF a year in 2011.

Source: SWRCB, 2011

Non-potable Urban Uses

- Recycled water for landscape irrigation has increased from 40,000 AF per year in 1987 to more than 112,000 AF in 2011.
- Examples of urban uses include the use of recycled water for fire protection, air conditioning, toilet and urinal flushing, artificial snow making, concrete mixing and dust control.

Recycled water from Tapia is carried to irrigate highway medians, golf courses, school grounds and other public and commercial landscapes through 52 miles of water lines, 2 storage tanks, 3 reservoirs and 3 pump stations

El Dorado Irrigation District. Dual-plumbed homes have two sets of pipes serving each lot. One set is for drinking water. The other—purple piping—is for recycled water, which is used only for landscape irrigation.

The Mid-Valley Pipeline will carry water from the Coachella Canal in Indio to the water district's wastewater reclamation plant in Palm Desert, where it will be blended with recycled water and sent to golf courses for irrigation.

The Town of Windsor estimates that it is saving 275 million gallons of drinking water a year, by irrigating 400 acres of golf courses, vineyards, parks, pasture and fodder croplands with recycled water.

NORTH BAY WATER REUSE PROGRAM
Expanding Water Supplies with Regional Reuse

WATER SUPPLY CHALLENGES/ RECYCLED WATER BENEFITS

Water Supply Challenges

- The area has long depended on surface water – rivers, lakes, streams – and groundwater
- Surface water supplies are increasingly limited by environmental requirements
- Some groundwater basins are over-pumped, harming water levels and quality

Environmental Challenges

- A clean, reliable water supply is needed to continue restoration of tidal wetlands in San Pablo Bay
- Treated wastewater discharged to the Bay is subject to seasonal and treatment limits.

Recycled Water

Recycled water is a valuable resource currently discharged to the Bay

- Recycled water is highly treated
- Quality is near that of potable water
- Reliable and available, even in a drought
- Useful for agriculture and landscaping
- Lower cost than developing new potable water resources

Recycled Water: Safe, Proven, Dependable

- California Department of Public Health sets strict standards for use of recycled water
- Used in some areas of California for over 30 years
- Numerous scientific and health tests conducted that show its safety
- Can be safely and economically used for agricultural, parks, golf courses, public space landscaping, wetland habitat restoration and other environmental water needs.

NORTH BAY WATER REUSE PROGRAM
Expanding Water Supplies with Regional Reuse

PIPELINE CONSTRUCTION TECHNIQUES

Trenching

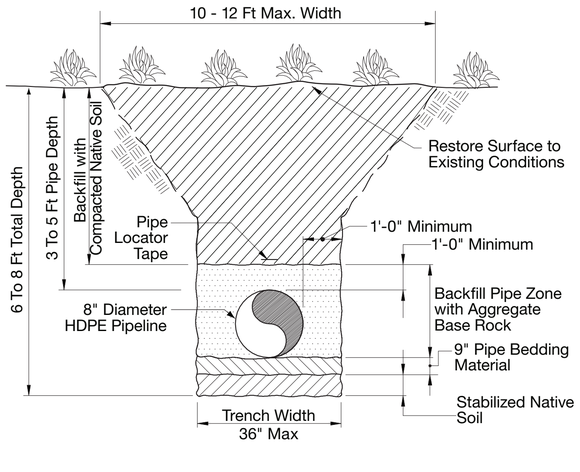
- Majority of pipeline in roadways
- Range from 4-inch to 36-inch-pipelines
- Conventional cut and cover construction
- Single lane closure

Jack and Bore Tunneling

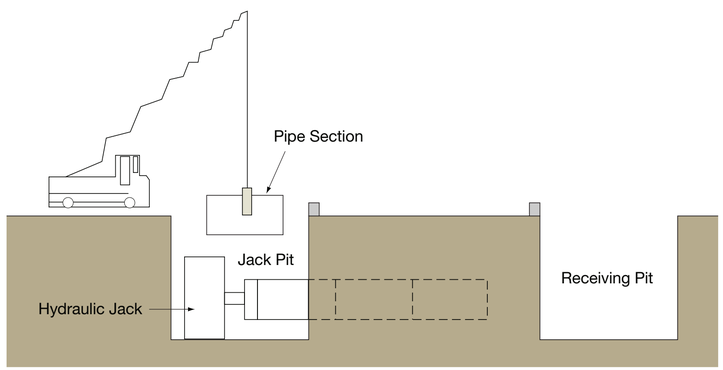
- Technique at sensitive areas or utility crossings
- Horizontal boring machine / auger
- Hydraulic jacks push pipe from jacking pit to receiving pit

Horizontal Directional Drilling

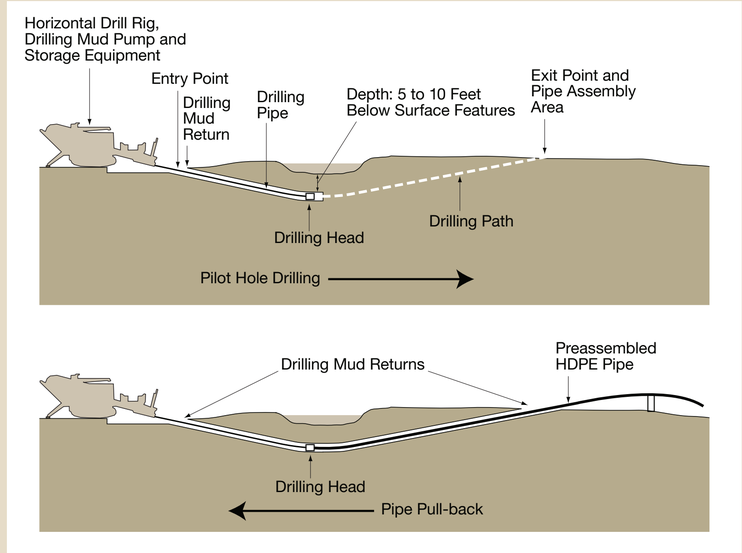
- Technique at sensitive areas or utility crossings
- Minimizes ground disturbance
- Horizontal drill rig directionally drills pilot hole
- Pilot hole enlarged to pipeline diameter
- Drilling mud used to control pilot hole and as drilling lubricant



Typical Open-cut Trench Section

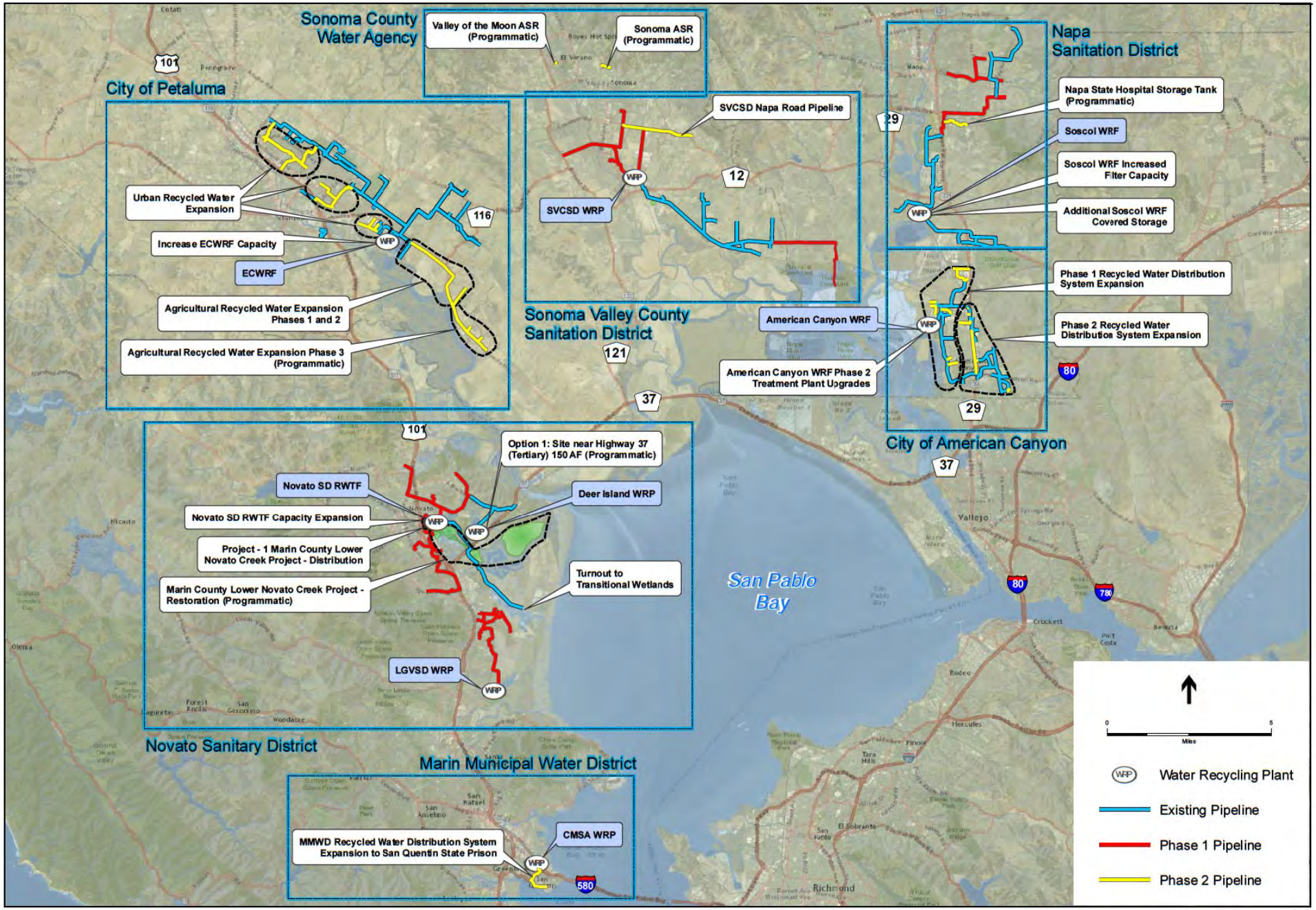


Typical Jack and Bore Pipeline Tunneling



Typical Horizontal Directional Drill Operation

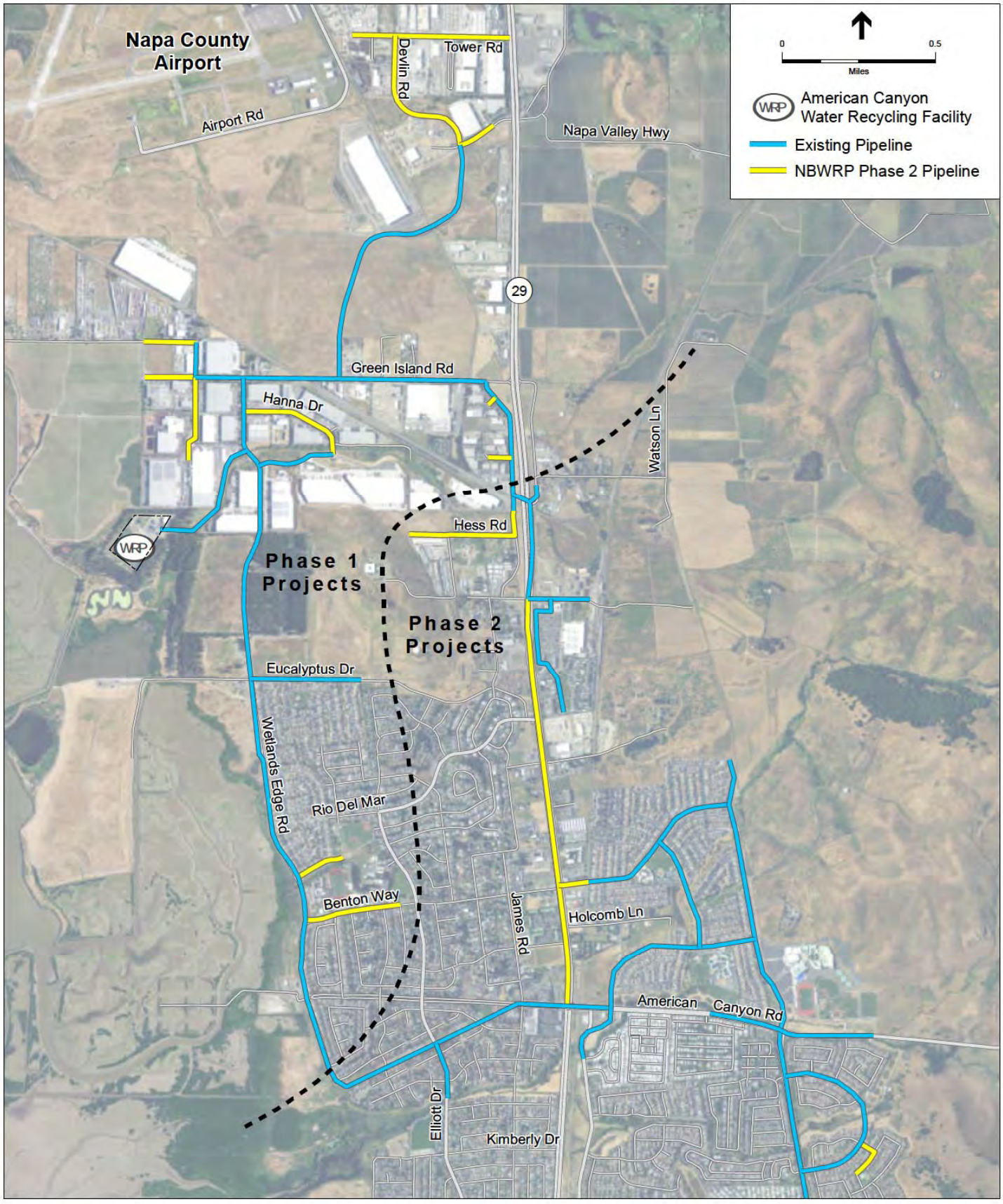
NORTH BAY WATER REUSE PROGRAM
Expanding Water Supplies with Regional Reuse



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

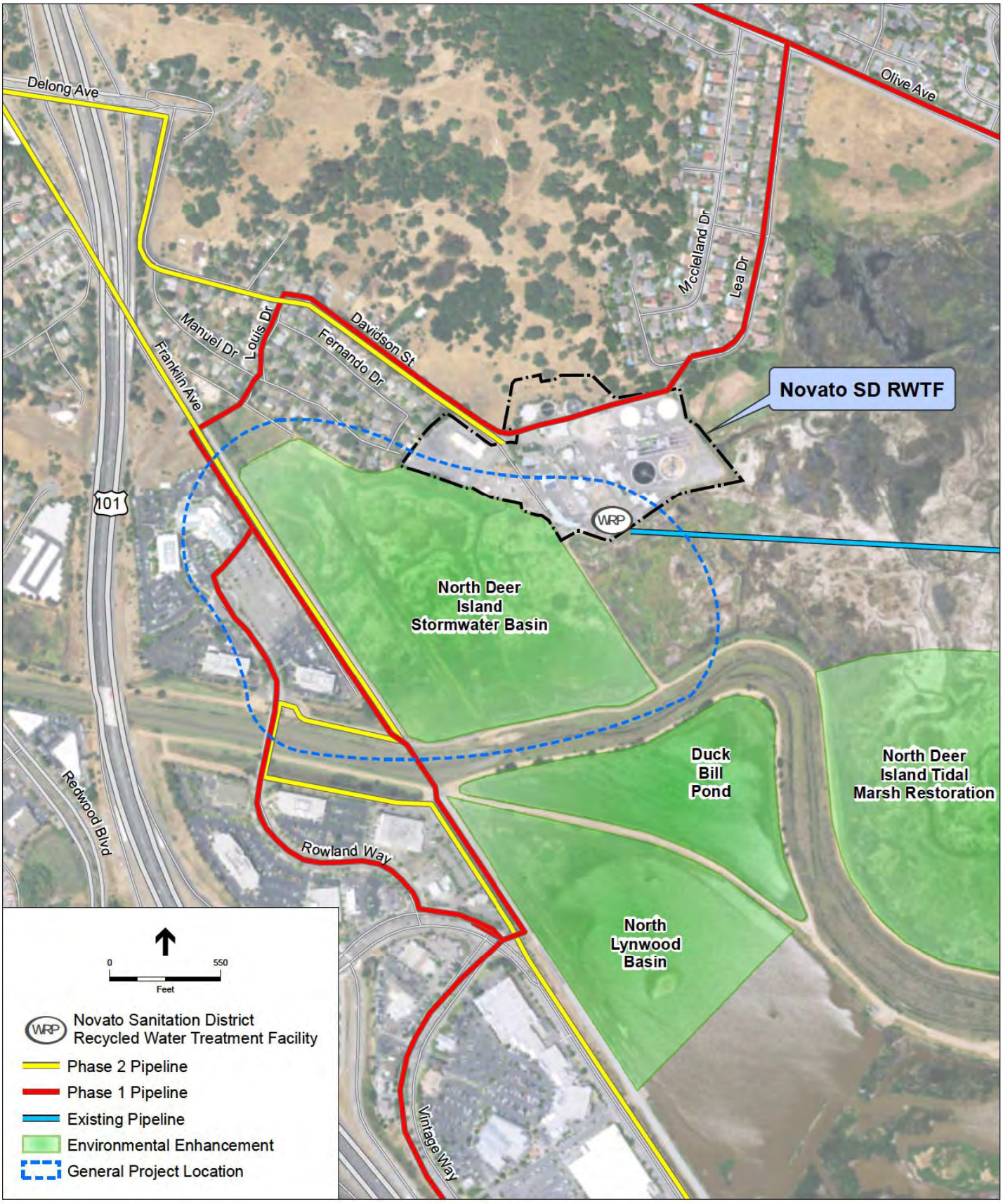
Figure 2
NBWRA Phase 2 Regional Project Map



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

City of American Canyon
Recycled Water Distribution System Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

Figure 3

Project 1 - Marin County Lower Novato Creek Project - Distribution

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

Figure 4
SVCSD Napa Road Pipeline

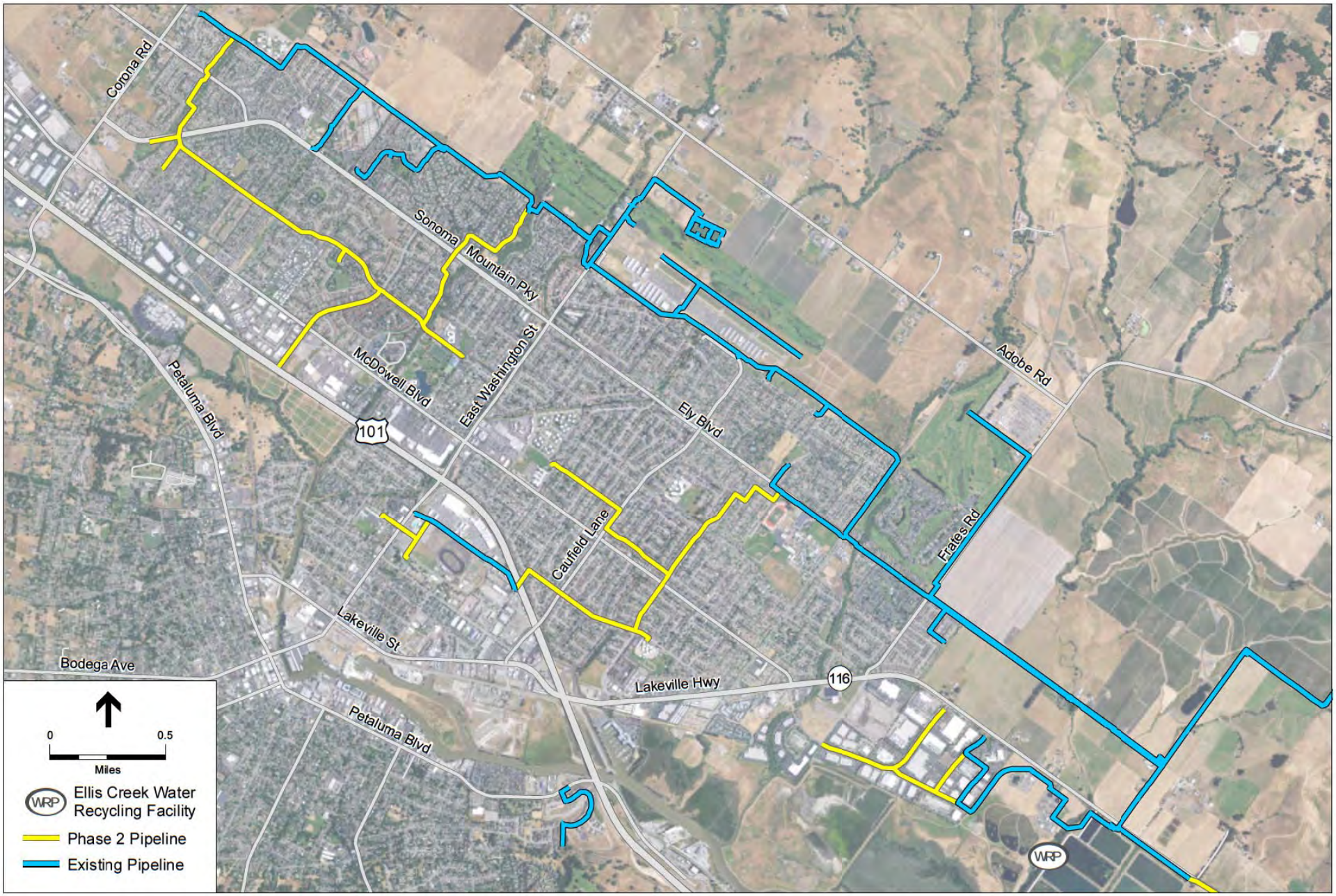
Note: CSMA= Central Marin Sanitation Agency

SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

Figure 5

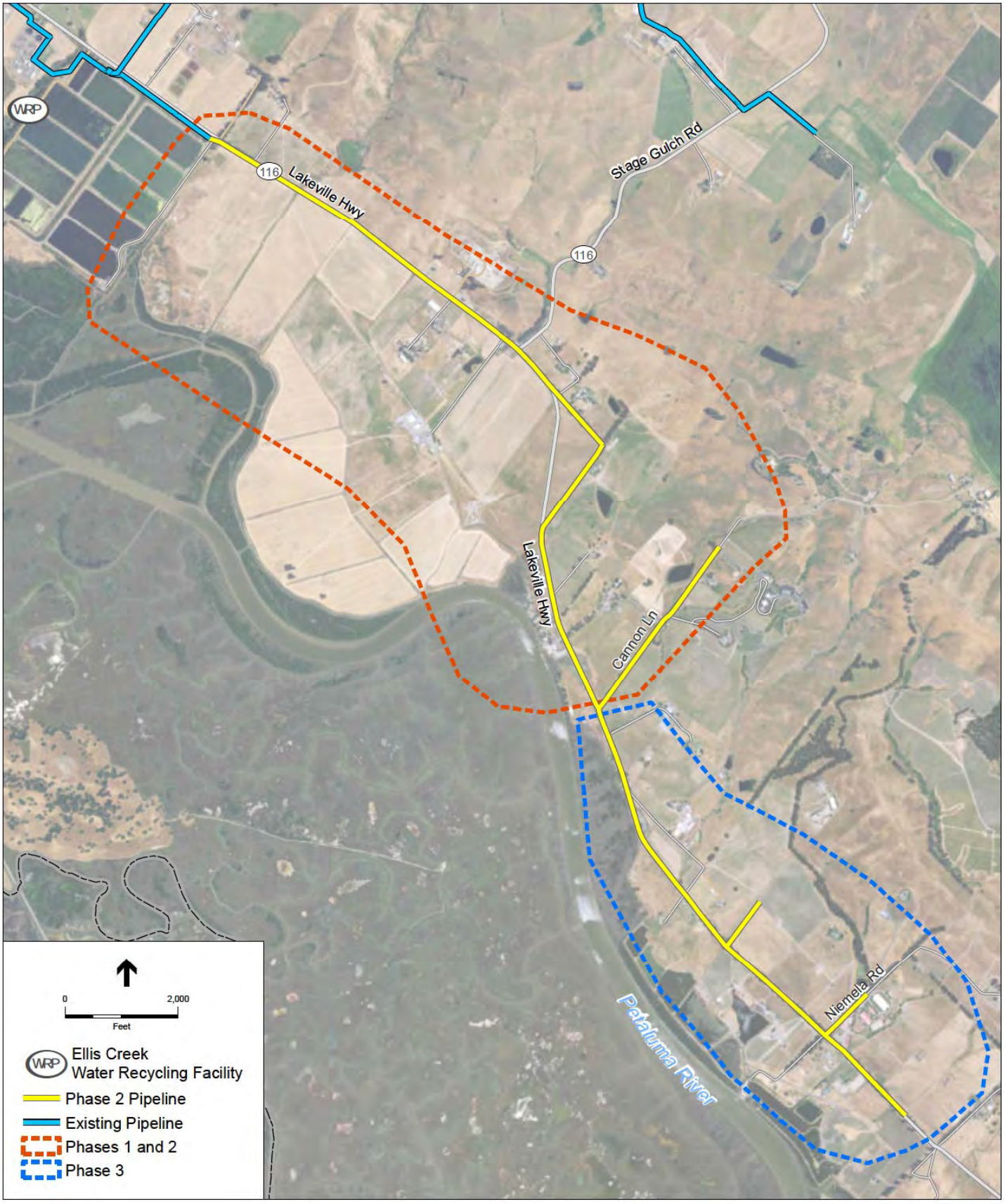
Marin Municipal Water District
Recycled Water Distribution
Expansion to San Quentin State Prison



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

Figure 6
City of Petaluma
Urban Recycled Water Expansion



SOURCE: North Bay Water Reuse Authority

North Bay Water Reuse Program Phase 2 EIS/EIR . 206088
Notice of Preparation

Figure 7
City of Petaluma
Agricultural Recycled Water Expansion
Phases 1, 2, and 3

APPENDIX E

Scoping Comment Letters

From:	Anne Bothwell
To:	Dave Davis
Subject:	RE: Notice of preparation
Date:	Monday, July 31, 2017 12:07:24 PM

Thank you. I received the report.
I do have some serious concerns.

When phase I of the project was implemented, the crew were using an empty lot opposite our home for staging purposes. We had just moved into our home and we did not know this project was about to occur. The noise was horrendous.
At one point I had to move out and go to stay at my mother's house. I had several conversations with a representative at Sonoma Water Agency about it. I also complained to the operator.

I am very concerned about the location of the contractor vehicles and the disruption and noise at the corner of 5th St and Napa where we live.

I had to have the exterior of the house pressue washed last year because of the dust, and our home was virtually unlivable for a month because of the noise.

I would like to hear more detail about where this project will be staged and managed, how long the project will last, and what will be done to mitigate noise and dust affecting our home.

Thank you.

Anne Bothwell

20525 5TH STREET E
Sonoma, CA 95476
Tel 707.939.8898

From: Dave Davis [mailto:DDavis@esassoc.com]
Sent: Thursday, July 27, 2017 1:22 PM
To: Anne Bothwell <abothwell@bothwellmarketing.com>
Cc: Phase2EIR@nbwra.org
Subject: RE: Notice of preparation

Good Afternoon Ms. Bothwell –

On behalf of the North Bay Recycled Water Authority and per your request, we are sending a printed copy

of the NOP today. You should receive it within the next few days.

Regards,
Dave

Dave Davis, AICP
ESA | Environmental Science Associates
707.796.7001 direct | 707.478.8059 mobile

From: Anne Bothwell [mailto:abothwell@bothwellmarketing.com]
Sent: Wednesday, July 26, 2017 11:26 AM
To: Phase2EIR@nbwra.org
Subject: Notice of preparation

Please send me a copy of the NOP for Phase 2.
Thank you

Anne Bothwell

20525 5TH STREET E
Sonoma, CA 95476
Tel 707.939.8898

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

August 17, 2017

04-SON-2017-00172
SCH# 2017072051

Ms. Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

North Bay Water Reuse Program Phase 2 – Notice of Preparation (NOP)

Dear Ms. Crealock:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans mission signals a modernization of our approach in evaluating and mitigating impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Travelled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the NOP.

Project Understanding

The North Bay Water Reuse Authority (NBWRA) proposes Phase 2 of the North Bay Reuse Program to continue increasing the beneficial use of recycled water and integrated water management. These projects will include construction and installation of facilities and operation of treatment capacity improvements, such as new distribution pipelines to deliver recycled water, pump stations to boost pressure for conveyance, and storage facilities (seasonal and operational) to provide recycled water for environmental, agricultural, and municipal reuse in the San Pablo Bay Region. The project will upgrade existing treatment capacities at the existing wastewater treatment plants (WWTPs) in the project area which encompasses approximately 318 square miles. Pipeline and pumping facilities would be installed within or along existing roadways. Treatment and storage facilities would be located at or near existing WWTPs. This recycled water would be used in a manner consistent with Title 22, pertaining to the use of tertiary-related recycled water.

The Phase 2 Program will be located in the North San Pablo Bay, which lies within the northern portion of the San Francisco Bay estuary in California. The project area extends approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa counties. The Phase 2 project area extends as far south as San Quentin in Marin County, as far north as El Verano in Sonoma County, and includes the cities of Napa an American Canyon in Napa County.

As the contract administrator for the NBWRA, the Sonoma County Water Agency (Water Agency) will act as Lead Agency under California Environmental Quality Act (CEQA) for preparing a joint Environmental Impact Report (EIR)/Environmental Impact Statement (EIS). The Department of Interior, Bureau of Reclamation, will be the federal Lead Agency under the National Environmental Policy Act.

Recognizing the continuing need for an integrated and regional approach to water management, wastewater and potable water agencies in the North San Pablo Bay region of California have joined together to propose an expansion of the existing recycled water use and integrated water management in the region. The NBWRA comprises of 11 wastewater and potable water utilities as member agencies – the Las Gallinas Valley Sanitary District, Novato Sanitary District, Sonoma Valley County Sanitation District, North Marin Water District, Napa County, Marin County (associate membership), Marin Municipal Water District, City of American Canyon, City of Petaluma, and the Sonoma County Water Agency. As the contract administrator for the NBWRA, the Sonoma County Water Agency will act as Lead Agency under CEQA for preparing a joint EIR/EIS. The NBWRA explores opportunities to coordinate "interagency efforts to expand the beneficial use of recycled water in the North Bay Region, thereby promoting the conservation of limited surface water and groundwater sources."

The project's network of pipelines will affect the following routes on the STN: U.S. 101 bifurcated at Franklin Avenue, Delong Avenue, and Lindberg Lane (in the City of Petaluma), State Route (SR) 116 from Stage Gulch Road to approximately 710 feet west of Traca Road, and SR 29 from American Canyon Road to Napa Junction Road.

Project Description
Please address the following:

- Timing and duration of project phasing, including specific project elements to be completed in each phase;
- The exact location and proximity of proposed pipelines in relation to the STN;
- Total number of construction trucks utilizing the STN; and
- Total number of employees during the construction phase and when fully operational.

Lead Agency
As the Lead Agency, the Sonoma County Water Agency is responsible for all project mitigation, including any needed improvements to the STN. The project's financing, scheduling, implementation responsibilities and monitoring should be fully discussed for all proposed mitigation measures.

Cultural Resources
The project area is highly sensitive to cultural resources. We recommend that the Sonoma County Water Agency conduct a cultural resource technical study that at a minimum includes a records search at the Northwest Information Center of the California Historical Resources Information

System (CHRIS), as well as a field survey of the project area by a qualified archaeologist and qualified architectural historian.

Additionally, per CEQA and Assembly Bill (AB) 52, we recommend that the Sonoma County Water Agency conduct Native American consultation with tribes, groups, and individuals who are interested in the project area and may have knowledge of Tribal Cultural Resources or other sacred sites.

If an encroachment permit is needed for work within Caltrans right-of-way (ROW), we may require that cultural resource technical studies be prepared in compliance with CEQA, Public Resources Code (PRC) 5024, and the Caltrans Standard Environmental Reference (SER) Chapter 2 (http://www.dot.ca.gov/ser/vol2/vol2.htm). Should ground-disturbing activities take place within Caltrans ROW and there is an inadvertent archaeological or burial discovery, in compliance with CEQA, PRC 5024.5, and the SER, all construction within 60 feet of the find shall cease and the Caltrans District 4 Office of Cultural Resource Studies shall be immediately contacted at (510) 622-1673.

Transportation Management Plan

Please identify whether any construction staging adjacent to US 101, SR 116, and SR 29 is anticipated. If it is determined that traffic restrictions and detours might be needed on or near US 101, SR 116, and SR 29, a Transportation Management Plan (TMP) may be required from the developer for approval by Caltrans prior to construction. Lane or shoulder closure charts for any work which interferes with operations of U.S. 101, SR 116, and SR 29 shall be submitted to Caltrans for review and approval. TMPs must be prepared in accordance with the California *Manual on Uniform Traffic Control Devices.* Further information is available for download at the web address below. Please ensure that such plans are also prepared in accordance with the TMP requirements of the Sonoma County. For further TMP assistance, please contact Juliana Gum of the Office of Operations Strategies at (510) 286-4579.
http://www.dot.ca.gov/hq/traffops/engineering/mutcd/pdf/camutcd2014/Part6.pdf.

Transportation Permit

Project work that requires movement of oversized or excessive load vehicles on the STN requires a transportation permit that is issued by Caltrans. To apply, a completed transportation permit application with the determined specific route(s) for the shipper to follow from origin to destination must be submitted to: Caltrans Transportation Permits Office, 1823 14th Street, Sacramento, CA 95811-7119. See the following website for more information: http://www.dot.ca.gov/hq/traffops/permits.

Encroachment Permit

An Encroachment Permit will be needed for all work affecting Caltrans ROW. The Sonoma County Water Agency can schedule an encroachment pre-application meeting with Arun Guduguntla at arun.guduguntla@dot.ca.gov. As part of the encroachment permit process, the

applicant must provide the appropriate CEQA approval, where applicable, for potential environmental impacts within the ROW. The applicant is responsible for quantifying the environmental impacts of the improvements within Caltrans ROW (project-level analysis) and completing appropriate avoidance, minimization and mitigation measures.

To apply for an encroachment permit, please complete an encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW, and submit to the following address: David Salladay, District Office Chief, Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process. See the website link below for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits.

Should you have any questions regarding this letter, please contact Stephen Conteh at (510) 286-5534 or stephen.conteh@dot.ca.gov.

Sincerely,

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

CALIFORNIA
Water Boards

EDMUND G. BROWN JR
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

AUG 18 2017

Anne Crealock
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Dear Ms.Crealock:

NOTICE OF PREPARATION (NOP) FOR THE SONOMA COUNTY WATER AGENCY (AGENCY); NORTH BAY WATER REUSE PROGRAM PHASE 2 (PROJECT); SONOMA COUNTY; STATE CLEARINGHOUSE NO. 2017072051

We understand that the North Bay Water Reuse Authority member agencies (Member Agencies) may be pursuing Clean Water State Revolving Fund (CWSRF) financing for their portion of this Project. As a funding agency and a state agency with jurisdiction by law to preserve, enhance, and restore the quality of California's water resources, the State Water Resources Control Board (State Water Board) is providing the following information on the preparation of the California Environmental Quality Act (CEQA) document for the Project.

The State Water Board, Division of Financial Assistance, is responsible for administering the CWSRF Program. The primary purpose for the CWSRF Program is to implement the Clean Water Act and various state laws by providing financial assistance for wastewater treatment facilities necessary to prevent water pollution, recycle water, correct nonpoint source and storm drainage pollution problems, provide for estuary enhancement, and thereby protect and promote health, safety and welfare of the inhabitants of the state. The CWSRF Program provides low-interest funding equal to one-half of the most recent State General Obligation Bond Rates with a 30-year term. Applications are accepted and processed continuously. Please refer to the State Water Board's CWSRF website at: www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.shtml.

The CWSRF Program is partially funded by the United States Environmental Protection Agency and requires additional "CEQA-Plus" environmental documentation and review. Three enclosures are included that further explain the CWSRF Program environmental review process and the additional federal requirements. For the complete environmental application package please visit: http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/srf_forms.shtml. The State Water Board is required to consult directly with agencies responsible for implementing federal environmental laws and regulations. Any environmental issues raised by federal agencies or their representatives will need to be resolved prior to State Water Board approval of a CWSRF financing commitment for the proposed Project. For further information on the CWSRF Program, please contact Mr. Ahmad Kashkoli, at (916) 341-5855.

Following are specific comments on the Agency's NOP:

1. Please consider including an explanation of the programmatic name change "North Bay **Water Recycling** Program" versus "North Bay **Water Reuse** Program." Although the acronym is the same, it would be prudent to notify the State Clearinghouse of the project name change.
2. Page 2 of the NOP mentions the "Phase I EIR." Please consider fully defining/spelling-out "Phase I" term. The term, "Phase I Program" is also used on page 8 of the NOP but should be clearly defined.
3. The above-mentioned paragraph, on Page 2, also mentions "the Program." Please consider defining whether this is the Phase I Program, the Phase 2 Program, or both.
4. Page 7 of the NOP indicates that Member Agencies will rely on this Project EIR/EIS. Please consider further prescribing how the Member Agencies would follow the CEQA Guidelines (Section 15164a) for their project-level analyses.
5. Please consider cumulative impacts, ensuring the benefits of the Project components do not rely on project activities not considered in the scope of the Phase 1/2 EIR/EIS.
6. How do the following benefits associated with the Phase I Program apply to the current Project?
    a) Reducing the amount of treated effluents discharged to the Napa River
    b) Consistency with Member Agency, local, and State recycled water policies
    c) Providing water supply for restoration of wetland marsh areas
    d) Reducing peak area demand for water

Following is further guidance regarding the CEQA-Plus requirements for the CWSRF Program:

It is important to note that prior to a CWSRF financing commitment, projects are subject to provisions of the Federal Endangered Species Act (ESA), and must obtain Section 7 clearance from the United States Department of the Interior, Fish and Wildlife Service (USFWS), and/or the United States Department of Commerce National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) for any potential effects to special-status species.

Please be advised that the State Water Board will consult with the USFWS, and/or the NMFS regarding all federal special-status species that the Project has the potential to impact if the Project is to be financed by the CWSRF Program. The Member Agency will need to identify whether the Project will involve any direct effects from construction activities, or indirect effects such as growth inducement, that may affect federally listed threatened, endangered, or candidate species that are known, or have a potential to occur in the Project site, in the surrounding areas, or in the service area, and to identify applicable conservation measures to reduce such effects.

In addition, CWSRF projects must comply with federal laws pertaining to cultural resources, specifically Section 106 of the National Historic Preservation Act (Section 106). The State Water Board has responsibility for ensuring compliance with Section 106 and the State Water Board must consult directly with the California State Historic Preservation Officer (SHPO). SHPO consultation is initiated when sufficient information is provided by the CWSRF applicant. The Member Agency must retain a consultant that meets the Secretary of the Interior's Professional Qualifications Standards (http://www.nps.gov/history/local-law/arch_stnds_9.htm) to prepare a Section 106 compliance report.

Note that the Member Agency will need to identify the Area of Potential Effects (APE), including construction and staging areas, and the depth of any excavation. The APE is three-dimensional and includes all areas that may be affected by the Project. The APE includes the surface area and extends below ground to the depth of any Project excavations. The records search request should extend to a ½-mile beyond project APE. The appropriate area varies for different projects but should be drawn large enough to provide information on what types of sites may exist in the vicinity.

Other federal environmental requirements pertinent to the Project under the CWSRF Program include the following (for a complete list of all environmental requirements please visit: http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/forms/application_environmental_package.pdf):

A. An alternative analysis discussing environmental impacts of the project in either the CEQA document (Negative Declaration, Mitigated Negative Declaration or Environmental Impact Report) or in a separate report.

B. A public hearing more meeting for adoption/certification of all projects except for those having little or no environmental impact.

C. Compliance with the Federal Clean Air Act: (a) Provide air quality studies that may have been done for the Project; and (b) if the Project is in a nonattainment area or attainment area subject to a maintenance plan; (i) provide a summary of the estimated emissions (in tons per year) that are expected from both the construction and operation of the Project for each federal criteria pollutant in a nonattainment or maintenance area, and indicate if the nonattainment designation is moderate, serious, or severe (if applicable); (ii) if emissions are above the federal de minimis levels, but the Project is sized to meet only the needs of current population projections that are used in the approved State Implementation Plan for air quality, quantitatively indicate how the proposed capacity increase was calculated using population projections.

D. Compliance with the Coastal Zone Management Act: Identify whether the Project is within a coastal zone and the status of any coordination with the California Coastal Commission.

E. Protection of Wetlands: Identify any portion of the proposed Project area that should be evaluated for wetlands or United States waters delineation by the United States Army Corps of Engineers (USACE), or requires a permit from the USACE, and identify the status of coordination with the USACE.

F. Compliance with the Farmland Protection Policy Act: Identify whether the Project will result in the conversion of farmland. State the status of farmland (Prime, Unique, or Local and Statewide Importance) in the Project area and determine if this area is under a Williamson Act Contract.

G. Compliance with the Migratory Bird Treaty Act: List any birds protected under this act that may be impacted by the Project and identify conservation measures to minimize impacts.

H. Compliance with the Flood Plain Management Act: Identify whether or not the Project is in a Flood Management Zone and include a copy of the Federal Emergency Management Agency flood zone maps for the area.

I. Compliance with the Wild and Scenic Rivers Act: Identify whether or not any Wild and Scenic Rivers would be potentially impacted by the Project and include conservation measures to minimize such impacts.

Following the preparation of the draft CEQA document for the Project, please provide us a copy of the document (and project-level Addendum, if applicable) to review if a Member Agency is considering to pursue CWSRF financing. In addition, we would appreciate notices of any hearings or meetings held regarding environmental review for the Project.

Thank you for the providing us a copy of your NOP, and considering of the CWSRF for the financing of the Agency's Project. If you have any questions or concerns, please feel free to contact me at (916) 341-6983, or by email at Cedric.Irving@waterboards.ca.gov, or contact Ahmad Kashkoli at (916) 341-5855, or by email at Ahmad.Kashkoli@waterboards.ca.gov.

Sincerely,

Cedric Irving
Environmental Scientist
Enclosures (3):

1. Clean Water State Revolving Fund Environmental Review Requirements
2. Quick Reference Guide to CEQA Requirements for State Revolving Fund Loans
3. Basic Criteria for Cultural Resources Reports

Cc: Agency: Phase2EIR@nbwra.org

State Clearinghouse
(Re: SCH# 2017072051)
P.O. Box 3044
Sacramento, CA 95812-3044

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., *Governor*
CHARLTON H. BONHAM, *Director*

August 21, 2017

Ms. Anne Crealock
Sonoma County Water Agency
404 Airport Boulevard
Santa Rosa, CA 95403

Dear Ms. Crealock:

Subject: North Bay Water Reuse Program – Phase 2, Notice of Preparation of a Draft Environmental Impact Report, SCH #2017072051, Sonoma County Water Agency

The California Department of Fish and Wildlife (CDFW) reviewed the Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) provided for the North Bay Water Reuse Program – Phase 2 (Project) located throughout several wastewater and potable water utilities, extending approximately 10 to 15 miles inland from the San Pablo Bay within Marin, Sonoma, and Napa counties. The NOP was received in our office on July 24, 2017.

CDFW is a Trustee Agency with responsibility under the California Environmental Quality Act (CEQA) §15386 for commenting on projects that could impact fish, plant and wildlife resources. CDFW is also considered a Responsible Agency if a project would require discretionary approval, such as the California Endangered Species Act (CESA) Permit, the Native Plant Protection Act, the Lake and Streambed Alteration Agreement (LSAA) and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife trust resources. Pursuant to our jurisdiction, CDFW has the following concerns, comments, and recommendations regarding the Project.

PROJECT DESCRIPTION AND LOCATION

The Project includes expanding the beneficial use of recycled water for the environment, agriculture, and urban irrigation. Project components would involve construction and installation of multiple facilities; such as new distribution pipelines to deliver recycled water, pump stations to boost pressure for conveyance, additional seasonal and operational storage facilities to store recycled water, and upgrades to current wastewater treatment plant capacities. The Project area encompasses more than 300 miles, including as far South as San Quentin in Marin County, as far North as El Verano in Sonoma County, and includes the cities of Napa and American Canyon.

The CEQA Guidelines (§§15124 and 15378) require that the draft EIR incorporate a full project description, including reasonably foreseeable future phases of the Project, and that contains sufficient information to evaluate and review the project's environmental impact. Please include a complete description of the following project components in the project description:

- Footprints of permanent Project features and temporarily impacted areas, such as staging areas and access routes.
- Encroachments into riparian habitats, wetlands or other sensitive areas.
- Area and plans for any proposed buildings/structures, ground-disturbing activities, fencing, paving, stationary machinery, landscaping, and stormwater systems.

- Operational features of the Project, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise and greenhouse gas generation, traffic generation, and other features.
- Construction schedule, activities, equipment and crew sizes.

CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site(s), include, but are not limited to:

- Swainson's hawk (*Buteo swainsoni*) threatened under CEQA;
- longfin smelt (*Spirinchus thaleichthys*) threatened under CEQA;
- Delta smelt (*Hypomesus transpacificus*) endangered under CEQA;
- California freshwater shrimp (*Syncaris pacifica*); endangered under CEQA;
- Foothill yellow-legged frog (*Rana boylii*) state candidate;
- salt marsh harvest mouse (*Reithrodontomys raviventris*) fully protected;
- California black rail (*Laterallus jamaicensis coturniculus*) fully protected;
- Ridgway's (clapper) rail (*Rallus longirostris obsoletus*) fully protected

Habitat descriptions and species profiles should include information from multiple sources: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from "positive occurrence" databases such as California Natural Diversity Database (CNDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.

CDFW recommends that prior to project implementation surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol.

Botanical surveys for special-status plant species, including those listed by the California Native Plant Society (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.

IMPACT ANALYSIS AND MITIGATION MEASURES

The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as:

- Potential for "take" of special-status species;
- Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alternation of soils and hydrology, and removal of habitat structural

features (e.g. snags, roosts, overhanging banks);
- Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence; and
- Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features.

The CEQA document also should identify reasonably foreseeable future projects in the Project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the Project's contribution to the impact (CEQA Guidelines, §15355). Although a project's impacts may be insignificant individually, its contributions to a cumulative impact may be considerable; a contribution to a significant cumulative impact – e.g., reduction of available habitat for a listed species – should be considered cumulatively considerable without mitigation to minimize or avoid the impact.

Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable project conditions to reduce potential impacts to biological resources to less-than-significant levels.

Swainson's Hawk
The draft EIR should include measures to avoid or minimize loss of Swainson's hawk foraging habitat that may result from implementation of the Project. Any permanent loss of hawk foraging habitat should be appropriately mitigated. CDFW recommends mitigation for loss of Swainson's hawk foraging habitat based on the following ratios:

- For projects within one-mile of an active nest tree, provide one-acre of land for each acre of development authorized (1:1 ratio).
- For projects within five miles of an active nest tree but greater than one-mile from the nest tree, provide 0.75 acres of land for each acre of development authorized (0.75:1 ratio).
- For projects within ten miles of an active nest tree but greater than five miles from an active nest tree, provide 0.5 acres of land for each acre of development authorized (0.5:1 ratio).

Mitigation lands associated with the Project should be of equal or greater value to the habitat that is lost and protected in perpetuity under a conservation easement. Funding for mitigation lands should be ensured for long-term management of Swainson's hawk habitat.

Fully Protected Species
Fully protected species such as salt marsh harvest mouse (*Reithrodontomys raviventris*), California black rail (*Laterallus jamaicensis coturniculus*), or Ridgway's rail (*Rallus longirostris obsoletus*) may not be taken or possessed at any time (Fish and Game Code § 3511).

Therefore, the draft EIR is advised to include measures to ensure complete take avoidance of these fully protected species.

REGULATORY REQUIREMENTS

California Endangered Species Act

Please be advised that a CESA permit must be obtained if the Project has the potential to result in "take" of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of a CESA Permit is subject to CEQA documentation; the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit.

CEQA requires a Mandatory Finding of Significance if a project is likely to substantially impact threatened or endangered species (CEQA §§ 21001(c), 21083, and CEQA Guidelines §§ 15380, 15064, 15065). Impacts must be avoided or mitigated to less-than-significant levels unless the CEQA Lead Agency makes and supports Findings of Overriding Consideration (FOC). The CEQA Lead Agency's FOC does not eliminate the Project proponent's obligation to comply with Fish and Game Code § 2080.

Lake and Streambed Alteration Agreement

CDFW will require an LSAA, pursuant to Fish and Game Code §§ 1600 et. seq. for Project-related activities within any 1600-jurisdictional waters within the proposed Project area. Notification is required for any activity that will substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake or stream. Work within ephemeral streams, washes, watercourses with a subsurface flow, and floodplains are subject to notification requirements. CDFW, as a Responsible Agency under CEQA, will consider the CEQA document for the Project. CDFW may not execute the final LSAA until it has complied with CEQA (Public Resources Code § 21000 et seq.) as the responsible agency.

FILING FEES

CDFW anticipates that the Project will have an impact on fish and/or wildlife, and assessment of filing fees is necessary (Fish and Game Code, § 711.4; Pub. Resources Code, § 21089). Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW.

If you have any questions, please contact Ms. Karen Weiss, Senior Environmental Scientist Supervisor, at (707) 944-5525 or karen.weiss@wildlife.ca.gov.

Sincerely,

Scott Wilson

Scott Wilson
Regional Manager
Bay Delta Region

STATE OF CALIFORNIA
NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

Edmund G. Brown Jr., Governor

To: Crealock

August 23, 2017

CF/71-700-2 North Bay Water Reuse Program - Phase 2 (ID 6810)

Anne Crealock
Sonoma County Water Agency
404 Aviation Blvd
Santa Rosa, CA 95403

RE: SCH# 2017072051, North Bay Water Reuse Program Phase 2, Marin, Napa, and Sonoma County

Dear Ms. Crealock:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cali Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or

tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.
b. The lead agency contact information.
c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have been already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions, please contact me at my email address: sharaya.souza@nahc.ca.gov.

Sincerely,

Sharaya Souza
Staff Services Analyst
cc: State Clearinghouse

Dave Davis

From: THPO@gratonrancheria.com
Sent: Friday, July 28, 2017 9:11 AM
To: Phase2EIR@nbwra.org
Subject: North Bay Water Reuse Program Phase 2

Dear Anne Crealock,

Thank you for notifying the Federated Indians of Graton Rancheria about North Bay Water Reuse Program Phase 2, a project within the Tribe's Ancestral Territory. We appreciate being notified and will review your project within 10 business days. If you have an immediate request please contact the Tribal Heritage Preservation Office for assistance by phone at (707) 566-2288 or by email at thpo@gratonrancheria.com.

Sincerely,
Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291

Antonette Tomic
THPO Administrative Assistant
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288, ext. 143
Fax: 707.566.2291
atomic@gratonrancheria.com


please consider our environment before printing this email.

YOCHA DEHE
CULTURAL RESOURCES

August 23, 2017

To: Crealock

CF/71-700-2 NBWRA (North Bay Water Resources Program, Phase 2) TW No (ID 6777)

Sonoma County Water Agency
Attn: Anne Crealock, Sr. Environmental Specialist
404 Aviation Boulevard
Santa Rosa, CA 95403

RE: North Bay Water Reuse Program - Phase 2

Dear Ms. Crealock:

Thank you for your project notification regarding cultural information on or near the proposed North Bay Water Reuse Program - Phase 2, American Canyon, Napa County. We appreciate your effort to contact us and wish to respond.

The Cultural Resources Department has reviewed the project and concluded that it is within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we have a cultural interest and authority in the proposed project area and wish to consult with the project lead agency.

Please provide our Cultural Resources Department with a project timeline, detailed project information and the latest cultural study for the proposed project. As the project progresses, if any new information or cultural items are found, we do have a process to protect such important and sacred artifacts. Upon such a finding, please contact the following individual:

James Sarmento, Cultural Resources Manager
Yocha Dehe Wintun Nation
Office: (530) 723-0452
Email: jsarmento@yochadehe-nsn.gov

Please refer to identification number YD – 05222017-01 in any correspondence concerning this project.

Thank you for providing us with project information and the opportunity to comment. Please contact Mr. Sarmento at your earliest convenience to coordinate a date and time for the consultation meeting.

Sincerely,

James Kinter
Tribal Secretary
Tribal Historic Preservation Officer

Appendix 3.2

Geology, Soils, Mineral Resources, and Paleontological Resources

3.2A. Setting and Regulatory Framework
3.2B. Impact Summary by Service Area

APPENDIX 3.2A
Setting and Regulatory Framework

3.2.1 Affected Environment

Mercalli Scale

The Modified Mercalli (MM) Intensity Scale is a seismic scale used to classify the intensity of an earthquake, and is not used in any regulatory planning.

TABLE A3.2-1: MODIFIED MERCALLI SCALE (MODIFIED)

Intensity Value	Intensity Description	Average Peak Acceleration[a]
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.014 g
III	Felt quite noticeably indoors; especially on upper floors of buildings, but many people do not recognize it as an earthquake.	< 0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound.	0.014–0.039 g
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned.	0.039–0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; minor fallen plaster or damaged chimneys. Damage slight.	0.092–0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken.	0.18–0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls.	0.34–0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse.	0.65–1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

NOTE:

[a] g is gravity = 980 centimeters per second squared. Acceleration is scaled against acceleration due to gravity or the acceleration with which a ball falls if released at rest in a vacuum (1.0 g). Acceleration of 1.0 g is equivalent to a car traveling 100 meters (328 feet) from rest in 4.5 seconds.

SOURCE: ABAG 2016; Wood and Ratliff 2011.

Regional Setting

Seismic Ground Shaking

Strong ground shaking from earthquakes generated by active faults in the Bay Area is a hazard to the project area. Ground shaking intensity is related to the size (i.e., magnitude) of an earthquake, the distance from the epicenter to the project's location, and the response of the geologic materials that underlie the site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to the site, the greater the intensity of ground shaking. Violent shaking is generally expected at and near the epicenter of a large earthquake, although studies of recent earthquakes, such as those conducted after the 1992 Landers (California) earthquake, indicate that directional ground motion along a fault can cause strong ground shaking farther away from the epicenter. Seismic hazards due to ground shaking can cause the greatest amounts of damage to structures and utilities and unsecured equipment.

The composition of underlying soils can be a primary determining factor of ground shaking because loose or soft alluvial sediments or fill, even those relatively distant from earthquake epicenters, can intensify ground shaking. Non-engineered artificial fill, if present, could intensify ground shaking effects in the event of an earthquake on one of the aforementioned faults. Areas directly underlain by bedrock would likely experience less-severe ground shaking due to the ability of the bedrock to attenuate seismic waves.

Strong ground shaking or ground motion is described as motion of sufficient strength to affect people and their environment. The common way to describe ground motion during an earthquake is with the motion parameters of acceleration and velocity in addition to the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA), which is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g) which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from a stopped position in 4.5 seconds. For comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake of 1989 was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. The highest value measured in the East Bay was 0.29 g, recorded at the Oakland Wharf near the Naval Supply Center. Soils at the wharf are artificial fill over bay mud. The lowest values recorded were 0.06 g in the bedrock on Yerba Buena Island. Recorded ground motion at the Stafford Dam south abutment in Novato resulting from the Loma Prieta event was 0.04 g.

Geologists and engineers attempt to predict earthquake ground acceleration at sites to improve the structural design of buildings and underground utilities to enable them to withstand earthquake motion. A probabilistic seismic hazard assessment describes seismic hazard from earthquakes that geologists and seismologists agree could occur. It is "probabilistic" in that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The results of probabilistic analyses are typically more realistic because it accounts for the full range of possible earthquakes, their location, frequency of occurrence, size, and the propagation of the earthquake motion from the rupture zone to the site of interest; the results take into account certainty in the vulnerability of structures. The fundamental difference between deterministic and probabilistic analyses is that deterministic analyses do not consider the probability associated with the earthquake hazard.

The California Geological Survey (CGS) has prepared Seismic Shaking Hazard Maps for areas with active faults to describe the statewide distribution of estimated ground motion throughout the state. These maps provide a conservative estimate, through probabilistic analysis, of the PGA. As shown in **Table A3.2-2** and based on estimates of this seismic hazards assessment, the PGAs in the region of NBWRP Phase 2 are estimated to range from 0.721 to 1.004 g (CGS, 2017). These are estimates; stronger shaking is possible. Seismic ground shaking is discussed in the impacts analysis further below.

TABLE A3.2-2: AVERAGE PEAK ACCELERATIONS

Location Relative to Project Area	Peak Ground Acceleration
Novato SD	1.004 g
SVCSD	0.721 g
SCWA	0.750 g
MMWD	0.756 g
Napa SD	0.738 g
Petaluma Ellis Creek WRF	0.969 g
American Canyon	0.752 g

SOURCE: CGS, 2017.

Topography

The topography of the Coast Range Geomorphic Province is characterized by northwest–southeast trending mountain ridges and intervening valleys that were formed by extensive faulting activity approximately 7 to 18 million years ago. More recent activity in the region is concentrated along the San Andreas Fault zone, which consists of a complex group of generally parallel faults. As a result of the tectonic activity, the topography of the North Bay varies greatly with relatively flat lowland areas near the bayshore to hilly slopes that reach up to over 1,000 feet above mean sea level (msl).

Novato SD. The Novato SD project components are located within the floodplains of Novato Creek and Petaluma River on flat to gently sloping bay margins and on the edge of gently sloping hills of the Coast Ranges with elevation ranging from 0 to 74 feet (Brown and Caldwell, 2017). Near the Novato WWTP, surface elevations begin to rise gradually towards a low-gradient hill feature, which rises to approximately 270 feet msl north of the WWTP.

SVCSD. The majority of the project area is located within southern Sonoma Valley, which is drained by Sonoma Creek. The SVCSD project component is located on flat to gently sloping alluvium with elevations ranging from 8 to 95 feet (Brown and Caldwell, 2017).

SCWA. The SCWA project components range in elevation from 100 to 220 feet (Brown and Caldwell, 2017).

MMWD. The MMWD project components are located at the northern edge of the San Francisco Bay on flat to gently sloping bay margins and gently sloping hills of Southern Heights Ridge with elevations ranging from approximately 8 to 155 feet (Brown and Caldwell, 2017).

Napa SD. The Napa SD project components are located on the east side of the Napa River and the eastern edge of Napa Valley on alluvium and gently rolling hills with elevations ranging from approximately 20 to 250 feet (Brown and Caldwell, 2017).

Petaluma. The Petaluma project components are located east of the Petaluma River and east of US Highway 101 on the flat alluvial valley and gently rolling hills of the Petaluma Valley with elevations ranging from 10 to 84 feet (Brown and Caldwell, 2017).

American Canyon. The American Canyon project components are located along the east side of the Napa River floodplain at elevation of approximately 9 to 128 feet (Brown and Caldwell, 2017).

Potential Geologic / Seismic Hazards

The project area could experience the effects of a major earthquake from one of the active or potentially active faults located within 100 miles of the project area. The four major hazards associated with earthquakes are fault surface rupture (ground displacement), ground motion (or ground shaking, discussed above), ground failure (e.g., liquefaction), and differential settlement. Considering the geologic context of the project area and nature of the project, the typical geologic hazards could include slope instability, soil erosion, settlement, and the potential to encounter expansive and/or corrosive soil materials. These hazards are discussed briefly below and provide the initial context for further evaluation in the impact analysis.

Seismic Hazards

Surface Fault Rupture. Surface fault rupture is typically observed and is expected on or within close proximity to the causative fault trace.[1] The Rodgers Creek and West Napa fault zones are the closest active faults to the project area identified and designated under the Alquist-Priolo Earthquake Fault Zoning Act (explained below in *Regulatory Framework*). Some project elements within the City of American Canyon are located within an Alquist-Priolo Earthquake Fault Zone (CGS, 1983). Surface fault rupture would not necessarily be limited to the boundaries of the Alquist-Priolo Fault Zones, however the risk of surface rupture outside these zones would be considered very low. Based on the relative hazard, this issue is discussed further under the impacts analysis below.

Liquefaction. Liquefaction is the sudden temporary loss of shear strength in saturated, loose to medium dense, granular sediments subjected to ground shaking. Liquefaction generally occurs when seismically-induced ground shaking causes pore water pressure to increase to a point equal to the overburden pressure. Liquefaction can cause foundation failure of buildings and other facilities due to the reduction of foundation bearing strength. The potential for liquefaction depends on the duration and intensity of earthquake shaking, particle size distribution of the soil, density of the soil, and elevation of the groundwater. Areas at risk due to the effects of liquefaction are typified by a high groundwater table and underlying loose to medium-dense, granular sediments, particularly younger alluvium and artificial fill. Liquefaction hazard maps produced by USGS for the Bay Area Region indicate that there is a moderate to very high hazard for liquefaction in several locations within the project area especially in the low lying areas that lie close to the Bay or other major drainages (USGS OFR 06-1037, 2006; ABAG, 2017). Specific liquefaction hazards zones within the general project area are illustrated in **Figure 3.2-2 (Appendix A)**. Based on the relative hazard, this issue is discussed further under the impacts analysis below.

Earthquake-Induced Settlement. Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Typically, areas underlain by artificial fills, unconsolidated alluvial sediments, slope wash, and areas with improperly engineered construction fills are susceptible to this type of settlement. In recognition of the variability of underlying material in the project area, earthquake-induced settlement is discussed further under the impacts analysis below.

Geologic Hazards

Slope Instability and Landslides. Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Rock slopes exposed to either air or water can undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and/or deep-seated rotational slides. As previously indicated, the project area contains areas that are generally level but also some

[1] Fault rupture is displacement at the earth's surface resulting from fault movement associated with an earthquake.

upland areas with steeper inclines. The issues related to potential landslides are discussed further under the impacts analysis below.

Soil Erosion. Soil erosion is the process whereby soil gets dislodged and transported downslope either by wind or water. Rates of erosion can vary depending on the surface soil material and structures, slope angle and length, and human activity. The erosion potential for soils in the project area will vary according to the type of soil and its characteristics as identified by the National Resource Conservation Service in their soil surveys. In general terms, soils containing high amounts of fine sand or silt can be easily eroded while clayey soils are generally less susceptible. Based on the disturbance area anticipated under NBWRP Phase 2, soil erosion is discussed further under the impacts analysis below.

Settlement. Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. The process whereby soil materials settle at varying rates depending on the load weight is referred to as differential settlement. Differential settlement can be a greater hazard than total settlement if there are variations in the thickness of previous and new fills or natural variations in the thickness and compressibility of soils across a building footprint. Settlement commonly occurs as a result of building construction or other large projects that involve soil stockpiling. NBWRP Phase 2 would entail the construction of new structures which could introduce new loads thereby resulting in the potential for settlement. This issue is addressed in the impacts analysis below.

Expansive Soils. Expansive soils are characterized by a shrink-swell characteristic.[2] Structural damage may result over a long period of time, usually resulting from inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils are largely comprised of clays, which expand in volume when water is absorbed and shrink when dried. Soil materials within the project area are generally comprised of fine sands, silts and in some locations finer clay materials. In recognition that a Geotechnical Investigation will be required for NBWRP Phase 2 in conjunction with the incorporation of standardized engineering practices for areas identified as containing expansive soil materials, this issue is discussed further in the impacts analysis below.

Corrosive Soils. Corrosive soils can damage underground utilities, including pipelines and cables, and can weaken roadway structures. Given that some of the project area is comprised of reclaimed marshland protected from tidal influx, the soil resource base is characterized by a higher than normal sodium content. This generally increases the susceptibility of steel and concrete structures to the effects of corrosion. However, current construction materials and practices provide engineering designs to prevent the potential for corrosion; therefore, this issue is not discussed further in this section.

Local Geology and Soils

Novato SD

The Novato SD project service area is located along the northwestern shore of San Pablo Bay. The Petaluma River flows into the Bay immediately north of the service area. The estuarine deposits are overlain by artificial fill beneath the Novato wastewater treatment plant (WWTP) site. The Novato SD project area's surficial geology is characterized by Bay mud and artificial fill over Bay mud (Brown and Caldwell, 2017).

The soil survey for Marin County identifies two soil map units across the Novato SD project area, which include the Reyes Association (0 to 2-percent slopes) and Xerothents-fill-urban land (0 to 9-percent slopes) (Brown and Caldwell, 2017). The more prominent unit within the project area is the Reyes Association. Developed areas

[2] "Shrink-swell" is the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as the result of inadequate foundation engineering.

are mapped as an urban complex which usually refers to the reworking of topsoils associated with development including roads and structures.

Reyes Association. This association of clays are somewhat poorly drained, have a low water capacity, high shrink-swell potential, associated with medium runoff, and have a low-medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 2 percent.

Xerothents-fill-urban land. This soil unit is comprised of fills and reworked soils associated with developed areas. Urban land soils have been altered to the extent that their original characteristics are no longer present. The soils are well drained, have varying water capacities, prone to very rapid runoff, and have a high hazard of water erosion. These soils are generally found on graded areas that are relatively flat or gently sloping ranging from 0 to 9 percent.

SVCSD

The surficial geologic units underlying the SVCSD project are Early to Late Pleistocene alluvial deposits (Brown and Caldwell, 2017). The SVCSD project component would be constructed within an existing road.

Soils in the area have been mapped as "soil associations," which are a broad grouping of soils with common characteristics such as similar management uses or slope steepness. Four soil associations occupy the terrain crossed by the SVCSD project area and are described below. The majority of the terrain is underlain by the Huichica Association and Haire Association. Surficial soils exhibit various characteristics dependent on location, slope, parent rock, climate, and drainage. Certain soils may have characteristics that if not appropriately engineered can be problematic to buildings and infrastructure. These characteristics can include low permeability or susceptibility to expansion or soil erosion.

Huichica Association. This association of loams are poorly drained, have a low available water capacity, low shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 9 percent.

Wright Association. This association of loams are poorly drained, have a low available water capacity, low-high shrink-swell potential, associated with high runoff, and have a medium-high hazard of water erosion. These soils are commonly found on slopes that range from 0 to 2 percent.

Haire Association. This association of loams are moderately well drained, have a low to moderate available water capacity, medium-high shrink-swell potential, associated with high to very high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 30 percent.

Yolo Association. This association of loams are well drained, have a very high available water capacity, low-medium shrink-swell potential, associated with low runoff, and have a medium-high hazard of water erosion. These soils are commonly found on slopes that range from 0 to 10 percent.

SCWA

The SCWA project service area is located in the northwest trending alluvial Sonoma Valley. The project area's surficial geology is composed of Sonoma Volcanics and Latest Pleistocene alluvial fan deposits (Brown and Caldwell, 2017). The SCWA project components would be constructed within existing roadways, sidewalks, or parking lots, or within previously disturbed native soils.

The soil survey identifies three soil map units across the SCWA project area, which include: the Goulding-Toomes Complex (9 to 50-percent slopes), the Red Hill Association (2 to 15-percent slopes), and the Clear Lake Association (0 to 5-percent slopes) (Brown and Caldwell, 2017). The more prominent units within the project area are the Goulding-Toomes Complex and the Red Hill Association.

Goulding-Toomes Complex. This soil complex of loams and bedrock are well drained, with very low water capacity, have a low-medium shrink-swell potential, show high runoff rates, and have a low-medium hazard of water erosion. These soils are generally found on hills and uplands ranging from 9 to 50 percent.

Red Hill Association. This association of loams and bedrock are moderately well drained, have a high available water capacity, medium-high shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on hills and uplands that range from 2 to 15 percent.

Clear Lake Association. This association of loams are poorly drained, have a high available water capacity, high shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 5 percent.

MMWD

The MMWD project service area includes the City of San Rafael and unincorporated areas of Marin County along San Rafael Bay. The MMWD project area's surficial geology is composed of artificial fill over San Francisco Bay Mud, undifferentiated latest Pleistocene to Holocene alluvium, and Franciscan Mélange (Brown and Caldwell, 2017). Alluvium[6] is a general term for loose clays, silt, sand, or gravels that have been deposited by a surface water body during recent geologic time. Most of the MMWD project components would be constructed within San Quentin Prison, the CMSA WRP, or along existing roadways.

The soil survey prepared by the NRCS identifies a variety of soil units within the City of San Rafael and the unincorporated village of San Quentin (Brown and Caldwell, 2017). The more prominent units within the MMWD project area include Xerorthents, Urban land-Xerorthents complex, Tocaloma-Saurin association, and Saurin-Bonnydoon complex. Developed areas are mapped as an urban complex, which usually refers to the reworking of topsoils associated with development including roads and structures.

Tocaloma-Saurin Association. This series of loams and bedrock are well drained, have a low available water capacity, low-medium shrink-swell potential, associated with medium to high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 15 to 30 percent.

Saurin-Bonnydoon Complex. This soil complex of loams and bedrock are generally somewhat excessively drained to well drained, with very low to low water capacity, have a medium-high shrink-swell potential, show high runoff rates, and have a low-medium hazard of water erosion. These soils are generally found on hills and uplands ranging from 2 to 30 percent.

Xerorthents, fill. This soil unit is comprised of fills and reworked soils associated with developed areas. Urban land soils have been altered to the extent that their original characteristics are no longer present. The soils are well drained, have varying water capacities, prone to very rapid runoff, and have a high hazard of water erosion. These soils are generally found on graded areas that are relatively flat or gently sloping ranging from 0 to 9 percent.

Napa SD

Napa Valley is another northwest trending valley similar to Sonoma Valley that is typical of the Coast Ranges geomorphic province. The surficial geology of the Napa SD project area is composed of Early to Late Pleistocene alluvial deposits, Sonoma Volcanics, and artificial fill (Brown and Caldwell, 2017). The Napa SD project components would be constructed in existing roadways or sidewalks, within the Soscol WRF, or within already urbanized or industrialized areas.

The soils within the Napa SD project area also include a wide range of soil types as mapped by the Soil Conservation Service (Brown and Caldwell, 2017). The Coombs Association and the Hambright Rock-Outcrop Complex are the most prominent soil units in the project area.

Reyes Association. This association of clays are somewhat poorly drained, have a low water capacity, high shrink-swell potential, associated with medium runoff, and have a low-medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 2 percent.

Coombs Association. This association of loams are somewhat well drained, have a very high water capacity, low-medium shrink-swell potential, associated with low runoff, and have a low-medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 5 percent.

Hambright Rock-Outcrop Complex. Typically found on more moderate slopes of upland areas, this weathered volcanic rock material is found on hills and some plateaus. The loamy upper layer is underlain by weathered bedrock that is well drained. Slopes range from 2 to 30 percent.

Petaluma

The Petaluma project service area is located along the eastern banks of the Petaluma River and east of US Highway 101. It is partially underlain by the Petaluma Formation. The Petaluma project service area's surficial geology is composed of Bay mud, Holocene alluvial fan deposits, fine-grained Holocene alluvial fan deposits, latest Pleistocene alluvial fan deposits, Petaluma Formation, and Franciscan schist, semischist/ metagraywacke (Brown and Caldwell, 2017). The Petaluma project components would be constructed within the Ellis Creek Water Recycling Facility (Ellis Creek WRF), along existing roadways or sidewalks, in fill or disturbed native materials, or in urbanized areas.

The soil survey for Sonoma County identifies six soil map units across the Petaluma project area, which include: the Clear Lake Association (0 to 5-percent slopes), Haire Association (0 to 3-percent slopes), Diablo Association (2 to 30-percent slopes), Reyes Association (0 to 2-percent slopes), Gullied Land and Tidal marsh (Brown and Caldwell, 2017). The more prominent units within the project area are the Clear Lake Association and the Haire Association.

Clear Lake Association. This association of clay and clay loams are poorly drained, have a high available water capacity, high shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 5 percent.

Haire Association. This association of loams are moderately well drained, have a moderate available water capacity, medium-high shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 30 percent.

Diablo Association. This association of clays are well drained, have a high available water capacity, high shrink-swell potential, associated with very high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 2 to 30 percent.

Reyes Association. This association of clays are somewhat poorly drained, have a low water capacity, high shrink-swell potential, associated with medium runoff, and have a low-medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 2 percent.

Gullied Land. This soil unit is classified as a miscellaneous area with little to no soil development. comprised of fills and reworked soils associated with developed areas.

Tidal Marsh. This soil unit is classified as a miscellaneous area with little to no soil development. comprised of fills and reworked soils associated with developed areas.

American Canyon

American Canyon is characterized by a northwest-trending alluvial plain. The American Canyon project area's surficial geology is composed of Latest Pleistocene to Holocene alluvial fan deposits, undifferentiated Franciscan Complex, Lower Cretaceous Upper Jurassic Great Valley Sequence, artificial fill, Early to Late Pleistocene alluvial deposits, and Domengine Sandstone. (Brown and Caldwell, 2017). The American Canyon project components would be constructed within existing roads or sidewalks, within urbanized areas, or within the American Canyon Water Reclamation Facility (American Canyon WRF).

The soil survey identifies four soil map units across the American Canyon project area, which include: the Haire Association (0 to 30-percent slopes), the Clear Lake Association (0 to 5-percent slopes), the Fagan Association (5 to 30-percent slopes), and the Reyes Association (0 to 2-percent slopes) (Brown and Caldwell, 2017). The more prominent units within the project area are the Haire Association and the Fagan Association.

Haire Association. This association of loams are moderately well drained, have a low to moderate available water capacity, medium-high shrink-swell potential, associated with high to very high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 30 percent.

Clear Lake Association. This association of loams are poorly drained, have a high available water capacity, high shrink-swell potential, associated with high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 5 percent.

Fagan Association. This association of loams and bedrock are well drained, have a moderate available water capacity, medium-high shrink-swell potential, associated with very high runoff, and have a medium hazard of water erosion. These soils are commonly found on slopes that range from 5 to 30 percent.

Reyes Association. This association of clays are somewhat poorly drained, have a low water capacity, high shrink-swell potential, associated with medium runoff, and have a low-medium hazard of water erosion. These soils are commonly found on slopes that range from 0 to 2 percent.

3.2.2 Regulatory Framework

The discussion of federal, state, regional, local, and other laws, regulations, standards, policies, and guidance which address Geology, Soils, Mineral Resources, and Paleontological Resource issues and used to determine the significance criteria presented in Section 3.2 is provided below.

Federal

There are no federal statutes or regulations that govern geologic, soil, seismic, or mineral resources or considerations in the project area.

State

Alquist-Priolo Earthquake Fault Zoning Act

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. The Alquist-Priolo Act requires the delineation of fault rupture zones along all active faults in California. Cities and counties must regulate certain development projects within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an area covered by the Alquist-Priolo Act.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2016 edition of the CBC is based on the 2015 International Building Code (IBC) published by the International Code Council, which replaced the Uniform Building Code (UBC). The code is updated triennially, and the 2016 edition of the CBC was published by the California Building Standards Commission on July 1, 2016, and took effect starting January 1, 2017. The 2016 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standard ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures, provides requirements for general structural design and includes means for determining earthquake loads[3] as well as other loads (such as wind loads) for inclusion into building codes. Seismic design provisions of the building code generally prescribe minimum lateral forces applied statically to the structure, combined with the gravity forces of the dead and live loads of the structure, which the structure then must be designed to withstand. The prescribed lateral forces are generally smaller than the actual peak forces that would be associated with a major earthquake. Consequently, structures should be able to (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage but with some nonstructural damage; and (3) resist major earthquakes without collapse, but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a structure designed in accordance with the seismic requirements of the CBC should not collapse in a major earthquake.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a seismic design category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site; SDC ranges from A (very small seismic vulnerability) to E/F (very high seismic vulnerability and near a major fault). Seismic design specifications are determined according to the SDC in accordance with CBC Chapter 16. CBC Chapter 18 covers the requirements of geotechnical investigations (Section 1803), excavation, grading, and fills (Section 1804), load-bearing of soils (Section 1806), as well as foundations (Section 1808), shallow foundations (Section 1809), and deep foundations (Section 1810). For Seismic Design Categories D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses measures to be considered in structural design, which may include ground stabilization, selecting appropriate foundation type and depths, selecting appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

Requirements for geotechnical investigations are included in Appendix J, CBC Section J104, Engineered Grading Requirements. As outlined in Section J104, applications for a grading permit are required to be accompanied by plans, specifications, and supporting data consisting of a soils engineering report and

[3] A load is the overall force to which a structure is subjected in supporting a weight or mass, or in resisting externally applied forces. Excess load or overloading may cause structural failure.

engineering geology report. Additional requirements for subdivisions requiring tentative and final maps and for other specified types of structures are in California Health and Safety Code Sections 17953 to 17955 and in 2013 CBC Section 1802. Testing of samples from subsurface investigations is required, such as from borings or test pits. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness.

The design of the proposed action is required to comply with CBC requirements, which would make the proposed action consistent with the CBC.

National Pollutant Discharge Elimination System (NPDES) Construction General Permit

Construction associated with the proposed action would disturb more than 1 acre of land surface affecting the quality of stormwater discharges into waters of the U.S. The proposed action would, therefore, be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb 1 acre or more of land surface, or that are part of a common plan of development or sale that disturbs more than 1 acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. Depending on the risk level, the construction projects could be subject to the following requirements:

1. Effluent standards;
2. Good site management "housekeeping;"
3. Non-stormwater management;
4. Erosion and sediment controls;
5. Run-on and runoff controls;
6. Inspection, maintenance, and repair; or
7. Monitoring and reporting requirements.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater from moving off site into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management and good housekeeping, and are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303 (d) list[4] for sediment.

[4] The 303 (d) list maintained by the State Water Resources Control Board lists water bodies impaired for sediment.

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303 (d) list for sediment. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay Regional Water Quality Control Board (RWQCB), which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a State Qualified SWPPP Developer and implementation of the SWPPP must be overseen by a State Qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify PRDs, is responsible for obtaining coverage under the permit.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation must be conducted and appropriate mitigation measures incorporated into the project's design. The CGS has not at this time completed seismic hazard zone reports within any of the topographic quadrangles that include project components.

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act (SMARA) of 1975 (found in Chapter 9, Division 2, Section 2710 et seq. of the Public Resources Code) requires the State Mining and Geology Board to adopt state policies for the reclamation of mined lands and the conservation of mineral resources. These policies are found in Title 24 of the California Code of Regulations, Division 2, Chapter 8, Subchapter 1.

Paleontology Regulations and Standard Guidelines

California Public Resources Code

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands. The sections of the California Administrative Code pertaining to the California

Department of Parks and Recreation afford protection to geological features and "paleontological materials", but grant the director of the State park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the State park system and for State park purposes (California Administrative Code Sections 4307–4309; as cited in USFWS/CDFG, 2006).

Society of Vertebrate Paleontology

In addition to the laws, regulations, and policies described in the regulatory framework, the standard practice in analyzing paleontological resources includes using guidance from the Society of Vertebrate Paleontology. Although not a law or regulation in the legal sense, these guidelines have become the standard in the industry.

The Conformable Impact Mitigation Guidelines Committee of the Society of Vertebrate Paleontology (SVP) published Standard Guidelines in response to a recognized need to establish procedures for the investigation, collection, preservation, and cataloguing of fossil bearing sites. The Standard Guidelines are widely accepted among paleontologists, followed by most investigators, and identify the two key phases of paleontological resource protection: (1) assessment and (2) mitigation. Assessment involves identifying the potential for a project site or area to contain significant nonrenewable paleontological resources that could be damaged or destroyed by project excavation or construction. Mitigation involves formulating and applying measures to reduce such adverse effects, including pre project survey and salvage, monitoring and screen washing during excavation to salvage fossils, conservation and inventory, and final reports and specimen curation. The SVP defines the level of potential as one of four sensitivity categories for sedimentary rocks: high, undetermined, low, and no potential as listed below.

1. **High Potential** – Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), and some low grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine grained fluvial sandstones, argillaceous and carbonate rich paleosols, cross bedded point bar sandstones, fine grained marine sandstones, etc.).

   Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene,[5] including deposits associated with animal nests or middens and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

2. **Undetermined Potential** – Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

3. **Low Potential** – Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or, based

[5] The Holocene is the latest interval of geologic time, covering approximately the last 11,700 years of the Earth's history.

on general scientific consensus, only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g., basalt flows or Recent (i.e., Holocene) colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

4. **No Potential** – This designation is assigned to geologic formations that are entirely plutonic (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

Local

General Plans

This section lists the goals and policies in the general plans for the cities and counties in the project area that could apply to geology, soils, mineral resources, and paleontological resources and the proposed action. Goals and policies relating to erosion control are discussed in Appendix 3.3B, Surface Hydrology.

City of San Rafael

The City of San Rafael General Plan 2020 (amended through 2013) establishes the following goals, policies and implementation actions regarding geology and soils that are applicable to the proposed action:

Goal 30: A Safe Community: It is the goal of San Rafael, as the first priority for city government, to provide excellent fire, public safety, and paramedic services and to be prepared in the case of disaster or emergency.

Policy S-2: Location of Public Improvements. Avoid locating public improvements and utilities in areas with identified flood, geologic and/or soil hazards to avoid any extraordinary maintenance and operating expenses. When the location of public improvements and utilities in such areas cannot be avoided, effective mitigation measures will be implemented.

Policy S-3: Use of Hazard Maps in Development Review. Review Slope Stability, Seismic Hazard, and Flood Hazard Maps at the time a development is proposed. Undertake appropriate studies to assure identification and implementation of mitigation measures for identified hazards.

Policy S-4: Geotechnical Review. Continue to require geotechnical investigations for development proposals as set forth in the City's Geotechnical Review Matrix (Appendix F). Such studies should determine the actual extent of geotechnical hazards, optimum design for structures, the advisability of special structural requirements, and the feasibility and desirability of a proposed facility in a specified location.

Policy S-4a: Geotechnical Review of Proposed Development. Require soils and geologic peer review of development proposals in accordance with the Geotechnical Review Matrix to assess such hazards as potential seismic hazards, liquefaction, landsliding, mudsliding, erosion, sedimentation and settlement in order to determine if these hazards can be adequately mitigated. Levels of exposure to seismic risk for land uses and structures are also outlined in the Geotechnical Review Matrix, which shall be considered in conjunction with development review.

Policy S-4b: Geotechnical Review Matrix. Periodically review and update the Geotechnical Review Matrix, which describes procedures for site-specific investigations for projects being reviewed according to proposed occupancy, type and hazard zone(s) within which the site is located.

Policy S-5: Minimize Potential Effects of Geologic Hazards. Development proposed within areas of potential geological hazards shall not be endangered by, nor contribute to, the hazardous conditions on

the site or on adjoining properties. Development in areas subject to soils and geologic hazards shall incorporate adequate mitigation measures. The City will only approve new development in areas of identified hazard if such hazard can be appropriately mitigated.

Policy S-7: Minimize Potential Effects of Landslides. Development proposed in areas with existing landslides or with the potential for landslides (as identified by a registered engineering geologist or geotechnical engineer) shall not be endangered by, nor contribute to, the hazardous conditions on the site or on adjoining properties. Development in areas subject to landslide hazards shall incorporate adequate mitigation measures that have a design factor of safety of at least 1.5 for static conditions and 1.0 for pseudo-static (earthquake) conditions. The landslide mitigation should consider multiple options in order to reduce the secondary impacts (loss of vegetation, site grading, traffic, visual) associated with landslide mitigation. The City will only approve new development in areas of identified landslide hazard if such hazard can be appropriately mitigated.

City of Novato

The City of Novato General Plan (City of Novato, 2016), lists the following goals and policies with regard to geology and soils that are applicable to the proposed action:

Goal SH 1: Maintain high levels of public safety and emergency preparation.

SH 1: Seismic and Geologic Hazards. Reduce the risk of loss of life, personal injury and property damage resulting from seismic and geologic hazards including ground shaking, land sliding, liquefaction and slope failure.

SH 1a: Geotechnical Evaluation. Require preparation of a report by an engineering geologist or geotechnical engineer for new construction and grading as required by City code on sites in seismically geologically hazardous areas and for all critical (high occupancy, health or emergency response) structures. These reports should include, but not be limited to: evaluation and recommendations to mitigate the effects of ground shaking, landslides, surficial debris flows, expansive soils, subsidence and settlement, fault displacement, and Bay mud areas. Implement the recommendations of geotechnical reports through the planning, grading and building permit processes.

SH 1b: Slope and Soil Instability. Enforce existing regulations and procedures to identify and avoid or mitigate potential hazards relating to geologic and soil conditions. Require repair, stabilization, or avoidance of landslides, or areas of soil creep or possible debris flow, as a condition of project approval. Require financial protection for public agencies and individuals as a condition of development approval where geological conditions indicate a potential for high maintenance costs.

Marin County

The Marin Countywide Plan (2014) sets forth the following goals, objectives, and policies regarding geology, soils, and mineral resources that are applicable to the proposed action:

Goal EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.1: Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

Policy EH-2.2: Comply with the Alquist-Priolo Act. Continue to implement and enforce the Alquist-Priolo Earthquake Fault Zoning Act.

Policy EH-2.3 Ensure Seismic Safety of New Structures. Design and construct all new buildings to be earthquake resistant. The minimum level of design necessary would be in accordance with seismic provision and criteria contained in the most recent version of the State and County Codes. Construction would require effective oversight and enforcement to ensure adherence to the earthquake design criteria.

City of Petaluma

The City of Petaluma General Plan 2025 (amended through 2012) sets forth the following policies and programs with respect to geology and soils:

10-P-1: Minimize risks of property damage and personal injury posed by natural hazards.

A. Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location.

D. Adopt and amend as needed updated versions of the California Building Code (CBC) so that optimal earthquake-protection standards are used in construction and renovation projects.

10-P-2: Protect the community from risks associated with seismically induced surface ruptures, ground-shaking, ground failure, slope instability leading to mudslides and landslides, subsidence, liquefaction, and other seismic, geologic, and fire hazards.

A. Adopt and maintain a Hazard Mitigation Plan (HMP) in compliance with applicable state and federal regulations.

City of Sonoma

The City of Sonoma 2006-2020 General Plan Update (2006) sets forth the following goals, policies, and implementation measures with respect to geology and soils:

Goal ER-2: Identify, preserve, and enhance important habitat areas and significant environmental resources.

***Policy 2.5*:** Require erosion control and soil conservation practices that support watershed protection.

Implementation Measure 1.3.1: Review all proposed actions for adequacy of fire protection, including: response time; emergency access, water supply, and fire flow; vegetation clearance and visible addressing; spacing between buildings; construction materials; and refuse removal.

Goal PS-1: Minimize risks to life and property associated with seismic and other geologic hazards, fire, hazardous materials, and flooding.

***Policy 1.1*:** Require development to be designed and constructed in a manner that reduces the potential for damage and injury from natural and human causes to the extent possible.

Implementation Measure 1.1.1: Require development to incorporate measures that mitigate risks associated with seismic, geologic, fire, or flood hazards to acceptable levels.

Sonoma County

The Sonoma County Draft General Plan Update 2020 (Sonoma County, 2014) establishes the following goals, objectives, and policies with respect to geology, soils, and paleontological resources that are applicable to the proposed action:

Goal OSRC-11: Promote and encourage soil conservation and management practices that maintain the productivity of soil resources.

***Objective OSRC-11.2*:** Establish ways to prevent soil erosion and restore areas damaged by erosion.

Policy OSRC-11b: Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.

Policy OSRC-11d: Require a soil conservation program to reduce soil erosion impacts for discretionary projects that could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.

Policy OSRC-11e: Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.

Policy OSRC-11g: Continue to enforce the Uniform Building Code to reduce erosion and slope instability problems.

Goal OSRC-19: Protect and preserve significant archaeological and historical sites that represent the ethnic, cultural, and economic groups that have lived and worked in Sonoma County, including Native American populations. Preserve unique or historically significant heritage or landmark trees.

***Objective OSRC-19-6*:** Develop and employ procedures to protect the confidentiality and prevent inappropriate public exposure of sensitive archaeological resources and Native American cultural resources, sacred sites, places, features, or objects.

Policy OSRC-19j: Develop an archaeological and paleontological resource protection program that provides:

(1) Guidelines for land uses and development on parcels identified as containing such resources,

(2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance, and

(3) Educational materials for the building industry and the general public on the identification and protection of such resources.

Goal PS-1: Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides, and other geologic hazards.

***Objective PS-1.1*:** Continue to develop and utilize available data on geologic hazards and associated risks.

***Objective PS-1.2*:** Regulate new development to reduce the risks of damage and injury from known geologic hazards to acceptable levels.

***Objective PS-1.3*:** Use the Sonoma County Hazard Mitigation Plan to help reduce future damage from geologic hazards.

Policy PS-1f: Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards areas shown on Public Safety Element hazard maps and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.

Policy PS-1k: Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.

City of Napa

The City of Napa General Plan (2015) establishes the following goals and policies with respect to geology and soils that are applicable to the proposed action:

Goal HS-1: To minimize the risk to life and property from seismic activity.

***Policy HS-1.2*:** The City shall discourage the siting of facilities necessary for emergency services, major utility lines and facilities, manufacturing plants using or storing hazardous materials, high occupancy structures (such as multi-family residences and large public assembly facilities), or facilities housing dependent populations (such as schools and convalescent centers) within areas subject to very strong, violent, or very violent ground shaking, as indicated in the ABAG Groundshaking Intensity Maps (Figure 8-1A and B), unless no alternative is available and adequate mitigation measures can be incorporated into the project.

***Policy HS-1.4*:** The City shall require special construction features in the design of structures where site investigations confirm potential seismic hazards.

Goal HS-2: To minimize the hazards to people and property caused by soil erosion and landslides.

***Policy HS-2.1*:** The City shall seek to minimize grading and impermeable surfaces in high-erosion areas. If grading or impermeable surfaces are necessary, they shall be properly engineered and drained to reduce runoff and erosion.

***Policy HS-2.3*:** The City shall continue to regulate development on hillsides to reduce the hazards posed by soil erosion and landslides.

***Policy HS 2.4*:** The City shall require that an erosion control plan be prepared and approved for development on slopes of 15 percent or greater. The plan should include limitations on vegetation removal, revegetation, and installation of other erosion and sedimentation control measures.

City of American Canyon

The American Canyon General Plan (amended through 2010) sets forth the following goals, objectives, and policies with respect to geology and soils:

Goal 9: Reduce the potential level of death, injury, property damage, economic and social dislocation (i.e., business closure and homelessness due to structural damage) and disruption of vital services that could result from earthquake damage.

Goal 9C: Ensure that seismic, geologic, and soils hazards that might affect areas designated for human use or habitation are properly mitigated or avoided entirely prior to development.

Goal 9D: Ensure that the City's public infrastructure is designed in a manner that reduces the risk of system failure in the event of an earthquake.

***Objective 9.1*:** Protect life, ensure public safety, substantially reduce the damage to and ensure the orderly evacuation of building occupants following a seismic event.

Policy 9.1.2: Implement mandatory development restrictions and investigation requirements (by the state, under the Alquist-Priolo Act, or by the City) on that portion of the West Napa fault zone located within American Canyon and its Planning Area.

***Objective 9.2*:** Protect health and life safety, and reduce the level of potential property damage from the adverse effects of strong seismic ground shaking by implementing effective, state-of-the-art standards for seismic design of structures in the City.

Policy 9.2.2: Require that development be designed in accordance with seismic requirements of the Uniform Building Code.

***Objective 9.3*:** Protect life and essential lifelines (e.g., gas, electricity, water), reduce the risk of property damage due to liquefaction, and promote the collection of more complete information on liquefaction susceptibility throughout the Planning Area.

Policy 9.3.1: Avoid development in areas with known liquefaction risk. If these areas cannot be avoided, require a qualified geologist, hydrologist, or civil engineer to determine the liquefaction potential at proposed development sites.

Policy 9.3.2: Require the submittal of liquefaction mitigation plans for proposed developments located in areas determined to have a high level of liquefaction risk.

Policy 9.3.3: Require that natural gas, electric, water, sewer and communication systems located in areas of liquefaction risk be designed to mitigate potential hazards.

Policy 9.3.5: Encourage the development of a means by which the liquefaction potential of developed site may be identified and reduced.

***Objective 9.4*:** Protect life, ensure safety, and substantially reduce the potential level of property damage from landslides, mudflows, slope failures and soil hazards. Promote the collection and utilization of more complete information on slope instability potential throughout the City and Planning Area.

Policy 9.4.1: Require the determination of the landslide, slope instability, and erosion potential of all proposed development sites with a grade of 10 percent or greater and incorporate pertinent measures in the project design to mitigate this potential. Exception to these mitigation requirements shall be considered for agricultural areas.

Policy 9.4.2: Require the determination of liquefaction (lateral spreading) potential for all development sites in coarse and medium-grained alluvium areas (Qhbm, Qham, and Qhac) of slopes with grades of less than 15 percent and incorporate pertinent measures in the project design to mitigate this potential. Exceptions to these mitigation requirements shall be considered for agricultural areas.

Policy 9.4.4: Require an assessment of potential damage to essential lifelines (e.g., gas, water, electric, communication, sewer) due to landslides and implement appropriate mitigation measures.

Policy 9.4.5: Review proposals for new development and expansion of existing development in areas that are susceptible to collapsible or expansive soils and require adequate mitigation of these hazards.

Policy 9.4.6: Require that proposed developments in landslide hazard areas submit information regarding pertinent conditions prepared by a qualified geologist or civil engineer.

Policy 9.4.7: Require that proposed developments in landslide hazard areas submit plans to adequately stabilize slopes and unstable soils onsite and prevent impacts on adjacent properties.

Policy 9.4.8: Encourage the use of landscape materials in areas of landslide hazard and unstable soils that promote stability.

Napa County

The Napa County General Plan Update (2013) includes the following goals and action items regarding geology and mineral resources applicable to the proposed action:

Goal CON-7: Identify and conserve areas containing significant mineral deposits for future use and promote the reasonable, safe, and orderly operation of mining and extraction and management activities, where environmental, aesthetic, and adjacent land use compatibility impacts can be adequately addressed.

Goal SAF-1: Safety considerations will be part of the County's education, outreach, planning, and operations in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire, flood, geologic, and other hazards.

Policy SAF-3: The County shall evaluate potential safety hazards when considering General Plan Amendments, rezonings, or other project approvals (including but not limited to new residential developments, roads or highways, and all structures proposed to be open to the public and serving 50 persons or more) in areas characterized by:

1) Slopes over 15 percent,
2) Identified landslides,
3) Floodplains,
4) Medium or high fire hazard severity,
5) Former marshlands, or
6) Fault zones.

APPENDIX 3.2B
Impact Summary by Service Area

This table provides a summary of potential impacts related to geology, soils, and seismicity.

POTENTIAL IMPACTS AND SIGNIFICANCE – GEOLOGY AND SOILS

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.2.1: Seismicity							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NINI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.2.2: Erosion							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.2.3: Unstable Soils							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.2.4: Expansive Soils							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.2.5: Mineral Resources							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.2.6: Paleontological Resources							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI

NOTES:
NI = No Impact
LS = Less than Significant Impact

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.3
Surface Hydrology

3.3A Setting and Regulatory Framework
3.3B Impact Summary by Service Area

APPENDIX 3.3A
Setting and Regulatory Framework

3.3.1 Affected Environment

Local Setting

Novato SD

Novato Creek Watershed

The Novato SD service area lies within the Novato Creek and Petaluma watersheds. Novato Creek extends approximately 17 miles in the approximately 44-square-mile Novato Creek watershed (City of Novato, 2014). The watershed extends from the western border in the coastal mountains just west of Stafford Lake east to San Pablo Bay. The upper watershed primarily includes agricultural areas and open space. The valley floor includes residential development with parks (City of Novato, 2014). Tributaries to Novato Creek include Arroyo San Jose and Arroyo Avichi (National Hydrography Dataset, 2017). Based on the data for Novato Creek (USGS, 2017), flows in the creek are heavily influenced by precipitation, with higher flows during the wet season and very low flows during the dry season. Lower Novato Creek is tidally influenced from San Pablo Bay to the reach upstream of the Redwood Boulevard bridge (SFEI, 2014).

Novato Creek and its tributaries are major sources of flooding in Novato. The Novato Creek watershed has experienced significant flooding in 1955, 1982, 1983, 1986, 2005-2006, and 2017. In the vicinity of the Novato SD Recycled Water Facility (RWF), Novato Creek is lined with levees and dredging does not occur; during flood events, the Marin County Flood Control District has breached the north channel levee east of the railroad bridge to allow floodwaters to fill the North Deer Island Basin, adjacent to the Novato SD wastewater treatment facility (Kamman Hydrology & Engineering and WRECO, 2014).

Wastewater treatment and recycled water production occur at the Novato SD wastewater treatment facility and the RWF in compliance with RWQCB Order No. R2-2015-0034 (NPDES No. CA0037958). Pursuant to this order, between June 1 through August 31 discharge of treated water from the Novato SD WWTP to San Pablo Bay is generally prohibited and Novato SD diverts effluent into two storage ponds, from where the effluent is used to irrigate pasturelands. Plant effluent can also be further treated (to tertiary standards) and used for golf course irrigation and other uses. Recycled water is also utilized at a wildlife habitat pond. When effluent volume exceeds reclamation water demand, however, the capability exists to discharge from the storage ponds any surplus water not used for reclamation to San Pablo Bay through the Novato SD outfall pipeline. During 2013, the Novato SD wastewater treatment facility provided secondary treatment for an average of 4.2 mgd. Up to 170 million gallons of secondary treated water can be stored in the existing storage ponds; an additional 0.85 mgd is treated to tertiary standards for reuse. Stormwater at the Novato SD wastewater treatment facility that is in contact with equipment or sewage is collected and directed to the headworks for treatment.

SVCSD

Sonoma Creek Watershed

The Sonoma Creek watershed drains an area of approximately 170 square miles between ridges of the Sonoma and Mayacamas Mountains. Sonoma Creek begins on Sugarloaf Ridge and flows 31 miles to North San Pablo Bay. The watershed is bounded by the Petaluma River watershed on the west, the Napa River watershed on the east, and the Russian River watershed on the north (McKee, et al., 2000). Land use within the watershed is predominantly rural with open space, grazing and agriculture, especially viticulture (wineries). Sonoma Creek is the principal drainage for the Sonoma Valley sub-basin. The southern Napa and Sonoma Valley basins receive an average of 20 to 24 inches of precipitation a year and the highest runoff occurs shortly after rainfall (USGS, 2008). Levels of precipitation and soil permeability affect the volume of creek and river flow into the Bay (Jones and Stokes, 2003). Some of the creeks and tributaries to Sonoma Creek include Dowdall Creek, Malone Creek, Carriger Creek, Felder Creek, Champlin Creek, Fowler Creek, Rodgers, Schell Creek, west and east Arroyo Seco, and unnamed tributaries.

Flooding in the city of Sonoma largely stems from two major streams, Nathanson Creek and Fryer Creek, which flow southward and lie on the east and west of the city respectively. Fryer Creek, the smaller of the two creeks, has a narrow and shallow 100–year flood plain. The most extreme flooding from Fryer Creek produces only nuisance street inundation, and historic flooding problems have been corrected through storm drain improvements. The 100–year flood plain for Nathanson Creek is also fairly narrow within the city, although flooding along the creek can threaten a few houses with minor interior inundation (City of Sonoma, 2004).

The SVCSD service area lies in the Sonoma Creek watershed. Wastewater treatment and recycled water production occur at the SVCSD WWTP in compliance with Order No. R2-2014-0020 (NPDES Permit No. CA0037800). Pursuant to this order, discharge to Schell Slough is seasonally limited between June 1 and August 31. SCVSD is permitted to discharge to multiple locations; the discharge locations used depend on the demand for recycled water. When there is little demand for recycled water and inflow to the SVCSD WWTP exceeds the capacity of the recycled water system, SVCSD discharges treated wastewater into Schell Slough. Schell Slough is a tidally-influenced dead-end slough which is flushed by limited tidal action and which ultimately flows into San Pablo Bay. Schell Creek discharges to Schell Slough upstream of the wastewater discharge point. Consistent with the Basin Plan (described in **Section 3.3.2.2**), discharge to Schell Slough is prohibited except under certain conditions that typically occur during wet weather, when upstream freshwater provides some flushing of Schell Slough.[1]

When the inflow to the SVCSD WWTP does not exceed the capacity of the recycled water system, effluent from the SVCSD WWTP is treated further (to tertiary standards) for reuse and ultimately discharged to two wetland areas (called Wetland Management Units 1 and 3), Fly Bay, or the Napa-Sonoma Marsh Wildlife Area for the purpose of maintaining freshwater marshlands and ponds. Average dry weather effluent flow in excess of 3 mgd is prohibited. The SVCSD WWTP provides tertiary treatment for an average dry weather flow of 3.0 mgd during dry weather and 16 mgd during peak wet weather. Four on-site basins are used for flow equalization and have a total storage capacity of 35 million gallons. Stormwater at the SVCSD WWTP that is in contact with equipment or sewage is collected and directed to the headworks for treatment.

MMWD

San Francisco Bay

The facilities proposed by MMWD would be located near the terminus of a peninsula (i.e., San Quentin Point) on which all drainage is either captured by stormwater drainage infrastructure or drains directly to the Bay.

[1] Discharge of treated wastewater from Discharge Point No. 001 is prohibited except when inflow to the SVCSD Plant exceeds the effective utilization capacity of the recycled water storage system (when influent flow exceeds 6 mgd and the recycled water storage ponds exceed 50 percent of their capacity).

The CMSA WWTP, which would provide recycled water for the MMWD project, is located within the City of San Rafael and treats domestic, commercial, and industrial wastewater from a service area of approximately 129,000 persons pursuant to RWQCB Order No. R2-2015-0051 (NPDES No. CA0038628). From 2007 to 2010, the average dry weather flow rate was 6.2 mgd and the average wet weather flow rate was 12.3 mgd. Secondary-treated water from the CMSA WWTP is released year-round to central San Francisco Bay through a submerged diffuser approximately 8,000 feet offshore. Reclaimed water is provided to Remillard Park Pond during the dry season when requested by the City of Larkspur.

All stormwater flows in contact with equipment or wastewater at the CMSA WWTP and the pump stations serving the plant are collected and directed to the headworks for treatment. Northeastern areas of the CMSA WWTP and shoreline areas of San Quentin Prison are subject to flooding during the one-percent chance annual exceedance event (FEMA). The shoreline area west of San Quentin Prison is subject to inundation should Phoenix Lake Dam fail (Marin County, 2015).

Napa SD

Napa River Watershed

The Napa River watershed covers an approximately 426 square-mile-area surrounding the 55-mile-long Napa River (Napa County Resource Conservation District [RCD], 2008). The watershed extends from Mount St. Helena in the north to San Pablo Bay in the south. The watershed is bordered on the west by the Mayacama Mountains and by a northwest-trending ridge on the east. The watershed includes undeveloped areas, such as forests in the hills, riparian vegetation near rivers and creeks, and grasslands in the valley. Much of the valley floor is developed including urban development in cities such as Calistoga, St. Helena, Rutherford, Oakville, Yountville, Napa, and American Canyon. Vineyards comprise 96-98 percent of the approximately 37,000 acres of agricultural land in the valley (Napa County, 2005). Major tributaries to Napa River include Huichica Creek, Carneros Creek, Browne Valley Creek, Redwood Creek, Dry Creek, Conn Creek, Rector Creek, Soda Creek, Sarco Creek, Tulucay Creek, Murphy Creek, Spencer Creek, Suscol Creek, Fagan Creek, and American Canyon Creek (Oakland Museum of California, 2008).

The Napa River has experienced serious flood events 21 times since 1862. In response to the damage from the flood in 1986, the Napa County Flood Control and Water Conservation District (FCWCD) and the U.S. Army Corps of Engineers are implementing the Napa River Flood Protection Project. The purpose of the project is to create a "Living River" by incorporating multiple goals that include reducing flood damage, restoring wetlands and reconnecting the river to the floodplain, providing river-related economic development opportunities, and expanding recreational opportunities. Multiple elements are complete, with remaining elements to be completed pending federal funding availability (Napa County FCWCD, 2014).

The Napa SD service area lies in the Napa River watershed. Wastewater treatment and recycled water production occur at the Napa SD Soscol Water Recycling Facility (Soscol WRF) in compliance with Order No. R2-2016-0008 (NPDES Permit No. CA0037575). Wastewater discharge from the Napa SD Soscol WRF to the tidally-influenced Napa River is permitted from October 1 to June 30. Between July 1 and September 30, discharge to the Napa River is generally prohibited and effluent is used to produce recycled water (reclamation). Reclaimed water is used to irrigate landscaping, industrial parks, golf courses, pastures, feed and fodder crops, a cemetery, Napa Valley College ball fields, a recreational park, and vineyards. Flows not used for reclamation remain in onsite oxidation ponds and an adjacent constructed treatment marsh and do not undergo clarification until the wet season begins and discharge to the Napa River is allowed. The permitted capacity is 15.4 million gallons per day (mgd) and a peak wet weather discharge capacity of 23.0 mgd. From April 1, 2011, through January 31, 2015, the daily average and maximum flow rates from the treatment plant to the Napa River were 11.3 and 20.6 mgd, respectively.

All stormwater flows that come into contact with equipment or sewage at the treatment plant and the pump stations serving the plant are collected and directed to the oxidation ponds for treatment.

City of Petaluma

Petaluma River Watershed

The Petaluma River watershed covers approximately 146 square miles (City of Petaluma, 2008). The watershed extends from upstream mountain peaks, including Sonoma Mountain, Mecham Hill, Weigand's Hill, and Mt. Burdell, south to San Pablo Bay. The valley area includes the urban and suburban development in the City of Petaluma, pasture and grazing, and vineyards. The lower 12 miles of the Petaluma River flow through Petaluma Marsh, the largest remaining intact salt marsh in the San Pablo Bay watershed (SCRD, 2017). Major tributaries include Adobe Creek, San Antonio Creek, Lichau Creek, and Lynch Creek (SCRD, 2017).

Flooding in the Petaluma River watershed generally occurs during winter and lasts about three to four days (City of Petaluma, 2008). The Petaluma River has experienced recent flood events in 1982, 1986, 1997, 1998, and 2005, of which the flood in 1982 was the most damaging and the most damage experienced in the upstream segments of the river. Portions of the Petaluma River and its tributaries are managed by the U.S. Army Corps of Engineers and the Sonoma County Water Agency. Management activities these agencies employ within the channels include dredging and vegetation removal (SCWA 2009; City of Petaluma, 2008).

The City of Petaluma operates the Ellis Creek Water Recycling Facility (Ellis Creek WRF) within the Petaluma River watershed, in compliance with Regional Water Quality Control Board Order No. R2-2016-0014 (NPDES No. CA0037810). Between 2011 and 2016 the average dry weather flow at the Ellis Creek WRF was 4.6 million gallons per day (mgd). The Ellis Creek WRF is prohibited from releasing treated water to the tidally-influenced Petaluma River from May 1 through October 20, unless treated water flow will exceed the capacity of the recycled water distribution and storage system to meet recycled water demand. This condition is atypical, and only occurs when irrigation fields are saturated. Normally during dry weather, all Ellis Creek WRF treated water flows to nearby pastures, golf courses, and vineyards. The average daily flow rate from the Ellis Creek WRF discharge point in the Petaluma River was 7.2 mgd between 2011 and 2016. Between 2012 and 2016, approximately 35 percent of the incoming wastewater was recycled by the Ellis Creek WRF. The existing treatment system at the Ellis Creek WRF can produce up to 4.68 mgd of recycled water.

American Canyon Water Reclamation Facility

North Slough, Napa River

The City of American Canyon operates the American Canyon Water Reclamation Facility (American Canyon WRF), which treats up to 2.5 mgd of wastewater collected from domestic and industrial users in American Canyon and releases treated water to North Slough, a tributary to the tidal portion of the Napa River, during the wet weather season, and to constructed freshwater wetlands year-round. The area of the North Slough watershed upstream of the American Canyon WRF discharge point is approximately 2.7 square miles (USGS, 2012). The 2-year peak flow event on North Slough is estimated to be approximately 100 cubic feet per second (USGS, 2012). Waste discharge requirements for the facility are set forth by the RWQCB in Order No. R2-2017-0008 (NPDES No. CA0038768). Between 2011 and 2015, the average effluent flows released to North Slough were 0.7 mgd; average flows released to the constructed wetlands were 0.8 mgd. The constructed freshwater wetlands would not exist without the year-round discharge.

During the dry season of each year, from May 1 through October 31, release of treated water to the North Slough is prohibited unless Facility inflow will exceed the influent storage capacity and Facility effluent flow will exceed the capacity of the recycled water and storage system.

The American Canyon WRF recycling facilities include a one-million-gallon storage tank and 1.5-million gallon storage tank and 10 miles of recycled water pipe. Recycled water is produced year-round at the

American Canyon WRF and is used onsite, at the local high school, and for local vineyards for irrigation and non-potable indoor uses.

All onsite stormwater at the American Canyon WRF is collected and routed to the headworks for treatment.

3.3.2 Regulatory Framework

Federal

This subsection describes the federal, state, and local environmental laws and policies relevant to hydrological resources.

Clean Water Act

The purpose of the federal Clean Water Act (CWA, 33 United States Code, Section 1251 et seq.) is restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters through prevention and elimination of pollution. The CWA applies to discharges of pollutants into waters of the United States. The State Water Resources Control Board (SWRCB) is the California agency primarily responsible for implementing state and federal regulations relating to hydrology and water quality issues. Most regulatory requirements are implemented by the SWRCB through its nine RWQCBs. The CWA operates on the principle that any discharge of pollutants into the nation's waters is prohibited unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

Section 402(p) of the CWA regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) Program, a nationwide surface water discharge permit program for municipal and industrial point sources. In California, NPDES permitting authority is delegated to and administered by the nine RWQCBs. Under Section 402, the San Francisco Bay RWQCB has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. In addition to their responsibility to issue and enforce compliance with NPDES permits, the RWQCBs are responsible for preparation and revision of the relevant regional Water Quality Control Plan, also known as the Basin Plan (discussed further under State regulations).

Additional discussion of the Clean Water Act as applies to water quality is included in Section 3.5, Water Quality.

Executive Orders 11988 and the Federal Emergency Management Agency

Under Executive Order 11988, FEMA is responsible for managing floodplain areas. FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities (e.g., the City of Petaluma) that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify land areas subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The FEMA design standard establishes the minimum level of flood protection for new development at the 1-percent chance annual exceedance event (i.e., the 100-year flood event).

For areas that are particularly important with respect to flood conveyance, FEMA in some cases divides the 100-year flood hazard area into a Regulatory Floodway (floodway) and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment from anything that might impede flows so that the 100-year flood can be carried without substantial increases in flood heights. The flood fringe is the area beyond the floodway but still within the 100-year flood hazard area (e.g., flood depths within the floodway fringe are expected to be relatively shallow).

Encroachment on floodplains by structures and fill can reduce flood-carrying capacity, increase flood heights and velocities, and increase flood hazards in areas beyond the encroachment itself. According to 44 CFR 60.3(d)(3), floodway encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway are prohibited, unless it has been demonstrated through hydrologic and hydraulic analyses that they would not result in an increase in existing flood levels. All projects in the floodway must undergo an encroachment review to determine their effect on flood flows and ensure that they do not limit the capacity of the floodway to ameliorate flooding. However, projects in the flood fringe are not required to undergo encroachment reviews as they would not increase flood heights above the allowable level. Pursuant to 44 CFR 60.3(c)(10), if base flood elevations but no floodway have been mapped in an area, prior to development in these areas it must be demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point in the community.

One aspect of floodplain management involves balancing the economic benefit of floodplain development against the resulting increase in flood hazard. Minimum federal standards limit such increases within the 100-year floodplain to 1 foot, cumulatively, during the 100-year flood event, provided that hazardous velocities are not produced. Within regulatory floodways, federal standards prohibit any increase in the 100-year flood elevation as a result of encroachment, unless a conditional floodway revision is applied for and ultimately approved by FEMA. Buildings, structures, and other development activities (such as fill) placed within a regulatory floodway are more likely to obstruct flood flows, causing the water to slow down and back up, resulting in higher flood elevations.

All projects in the regulatory floodway must undergo an encroachment review to determine their effect on flood flows and ensure that they do not cause unanticipated flooding.[2] Development projects in the flood fringe, by definition, do not increase flood heights above the allowable level; thus, encroachment reviews are not needed. Title 44 of the Code of Federal Regulations (CFR) 60.3(d)(3) states that communities must prohibit encroachments—including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway—unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the base flood discharge. Further, for any proposed alteration or relocation of a watercourse within a special flood hazard area, Title 44 of the CFR 60.3(b)(6) states that the community shall notify the National Flood Insurance Program State Coordinating Office and submit copies of such notifications to FEMA.

State

California Fish and Game Code Sections 1600-1616

California Fish and Game Code Sections 1600-1616 (Lake or Streambed Alternation Agreement Program) require notification of the California Department of Fish and Wildlife (CDFW) for any project that may substantially modify a river, stream, or lake. Specifically, project proponents must notify CDFW if a project could:

1. "Substantially divert or obstruct the natural flow of any river, stream or lake;
2. Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
3. Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." (CDFG, 2008)

[2] Federal Emergency Management Agency, n.d. National Flood Insurance Program Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials. Available online at https://www.fema.gov/media-library/assets/documents/6417.

If CDFW determines that the project or an alternative has the potential to adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement would be required for the Phase II Project to establish conditions to protect these resources. See Section 3.5, *Biological Resources*, for additional information.

Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board (SWRCB) and the nine RWQCBs. Under the Porter-Cologne Act, the SWRCB and RWQCBs also have the responsibility of granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. The Porter-Cologne Act allows the California SWRCB to adopt statewide Water Quality Control Plans and Basin Water Quality Control Plans, which serve as the legal, technical, and programmatic basis of water quality regulation statewide or for a particular region. The water quality control plans limit impacts on water quality from a variety of sources. The Basin Plan for the San Francisco Bay and the relevant permits are described below in this section.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters, that include San Pablo Bay, are under the jurisdiction of the San Francisco Bay RWQCB, which established regulatory standards and objectives for water quality in the Bay in the Water Quality Control Plan for the San Francisco Bay Basin, commonly referred to as the Basin Plan (RWQCB, 2011). The Basin Plan identifies existing and potential beneficial uses for surface and ground waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal CWA. Because beneficial uses, together with their corresponding water quality objectives, can be defined pursuant to federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control. Adoption or revision of surface water standards is subject to the approval of the USEPA.

NPDES General Permit for Discharges of Stormwater Associated with Construction Activities

Construction associated with the proposed project would disturb more than one acre of land surface affecting the quality of stormwater discharges into waters of the U.S. The proposed project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines. This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards (identified in the Basin Plan).

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. Depending on the risk level, the construction projects could be subject to the following requirements:

1. Effluent standards
2. Erosion and sediment controls
3. Good site management ("housekeeping")
4. Inspection, maintenance, and repair
5. Non-stormwater management
6. Monitoring and reporting requirements
7. Run-on and runoff controls

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater as well as non-storm water and from moving offsite into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management and good housekeeping. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Receiving water risk is based on whether the project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water bodies as impaired for sediment, has a USEPA-approved TMDL implementation plan for sediment, or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In addition to stormwater discharges, the Construction General Permit also covers other non-storm water discharges including irrigation of vegetative erosion control measures, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by the Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;
2. The discharge does not violate any other provision of the General Permit;
3. The discharge is not prohibited by the applicable Basin Plan;
4. The discharger has included and implemented specific BMPs required by the General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
6. The discharge is monitored and meets the applicable NALs; and
7. The discharger reports the sampling information in the Annual Report.

In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay Regional Water Quality Control Board (RWQCB), which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for

notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a state Qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state Qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify PRDs, is responsible for obtaining coverage under the permit.

NPDES General Permit and Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (Order No. 2013-0001-DWQ)

In 2003, the SWRCB required small municipal storm drainage systems, including those in Marin, Napa, and Sonoma Counties, to be regulated under a statewide NPDES Small Municipal Separate Storm Sewer Systems (MS4s) General Permit. Areas that drain to separate stormwater collection systems were subject to this permit. NBWRP Phase 2 projects would be constructed within areas that drain either to small MS4 permittee infrastructure (storm water runoff facilities) or to facilities subject to separate NPDES permits (discussed in relevant subsections of Section 3.3.1.2, Local Setting).

On February 5, 2013, the SWRCB adopted the General Permit for Waste Discharge Requirements (WDRs) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, Order No. 2013-001-DWQ (2013 MS4 permit). The 2013 MS4 permit modified the 2003 MS4 permit by establishing the storm water management program requirements in the Order and defining the minimum acceptable elements of the municipal storm water management program (general permit 2013). The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/ participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and redevelopment, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as Marin County, Napa County, Sonoma County, and the cities of Petaluma, Napa, American Canyon, Sonoma, and Novato, the guidance document must identify and describe BMPs included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the BMPs. Post-construction stormwater management low impact development standards must be applied to both private and public projects, to the extent allowable by applicable law. All permittees must have the legal authority to effectively prohibit non-storm water discharges through the stormwater facilities, require construction sites and industrial and commercial facilities to implement storm water best management practices, and review designs and proposals for new development and redevelopment. Regulated projects (identified in Section E.12 of the 2013 general permit) include linear underground or overhead projects with at least one discrete location that has 5,000 square feet or more of newly constructed contiguous impervious surface. Permittees must then use their legal authority to adopt and enforce ordinances or policies that require regulated project to implement measures for site design, source control, runoff reduction, storm water treatment and baseline hydromodification management as defined in this Order. Permittees must require all Regulated Projects to implement low impact development (LID) standards designed to reduce runoff, treat stormwater, and provide baseline hydromodification management to the extent feasible, to meet the Numeric Sizing Criteria for Storm Water Retention and Treatment included in the permit. The relevant ordinances or policies implementing these permit requirements are included in Section 3.3.2.3, Local.

A Permittee may propose alternative post-construction measures in lieu of some or all of Section E.12. requirements for multiple benefit projects. Multiple-benefit projects include projects that may address any of the following, in addition to water quality: water supply, flood control, habitat enhancement, open space preservation, recreation, climate change. Multiple-benefit projects may be applied at various scales including project site, municipal or sub-watershed level. Multiple-benefit projects may include, but are not limited to, projects developed under Watershed Improvement Plans (Water Code Section 16100 et seq.), IRWMP implementation and green infrastructure projects. Multiple benefit projects must be equally or more protective

of water quality than Section E.12. requirements. The Regional Water Board or the Executive Officer, may approve alternative post-construction measures for multiple-benefit projects, as described above, after an opportunity for public comment, if the Regional Water Board or Executive Officer finds that the alternative measures are consistent with the MEP standard

California Water Code

Sections 1210-1212 of the California Water Code apply to appropriation of treated wastewater. Pursuant to California Water Code Section 1211, the owner of any wastewater treatment plant shall obtain approval from the SWRCB, Division of Water Rights, prior to making any change in in the point of discharge, place of use, or purpose of use of treated wastewater that decreases the flow in any portion of a watercourse. Where the treated waste water has been introduced to the watercourse with the prior stated intention of maintaining or enhancing fishery, wildlife, recreational, or other instream beneficial uses, however, holders of existing water rights may not use or claim such water.

Changes in discharge resulting in decreasing the flow in any portion of a watercourse are reviewed by the SWRCB pursuant to Section 1700 of the California Water Code. A petition for change must include all information reasonably available to the petitioner, or that can be obtained from the California Department of Fish and Wildlife, concerning the extent, if any, to which fish and wildlife would be affected by the change, and a statement of any measures proposed to be taken for the protection of fish and wildlife in connection with the change. A petition must also include sufficient information to demonstrate a reasonable likelihood that the proposed change will not injure any other legal user of water.

A minor petition can also be filed, which describes any petition which does not involve direct diversions in excess of three cubic-feet per second or storage in excess of 200 acre-feet per year.

Local

Marin County

Marin County Municipal Code

In accordance with federal and state regulations, Marin County has adopted stormwater control and flooding standards applicable to areas within unincorporated Marin County.

Chapter 23.18, Stormwater Runoff Pollution Prevention, includes provisions designed to protect and enhance the water quality of Marin County's watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Clean Water Act, the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.), and the Phase II Small Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (phase II stormwater permit) and subsequent revisions and amendments thereto.

The discharge of material other than stormwater to a county storm drain or to an area of special biological significance (ASBS)[3] is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge. (Section 28.18.061) However, some discharges that could be generated during construction, such as uncontaminated pumped groundwater, diverted stream flows, and flows from riparian habitats and wetlands are exempt from this discharge prohibition provided any pollutants in the

[3] Area of special biological significance (ASBS) means those areas designated by the California State Water Resources Control Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All areas of special biological significance are also classified as a subset of state water quality protection areas. ASBS are also referred to as state water quality protection areas—areas of special biological significance. The nearest ASBS to the San Pablo Bay watershed are located outside the Golden Gate (SWRCB, 2017).

discharges are identified and appropriate control measures to minimize the impacts of such discharges are developed and implemented.

In particular, Section 28.18.093 of the county municipal code requires implementation of construction-phase best management practices designed to protect water quality and reduce sediment loading as follows:

> Any person performing construction activities in the county shall implement appropriate BMPs to prevent the discharge of construction wastes, including soil or sediment, or contaminants from construction materials, tools and equipment from entering a county storm drain, watercourse, bay or ocean. In addition:
>
> 1. Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading (soil disturbing) activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, covering of materials stored on-site, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The agency will provide references to current guidance manuals and BMP information on request.
> 2. When any work is being done contrary to the provisions of this article, the agency may order the work stopped by notice in writing served on any persons engaged in doing or causing the work to be done. Such work shall stop until the agency authorizes the work to proceed. This remedy is in addition to and does not supersede or limit any and all other remedies, both civil and criminal provided in the county of Marin Municipal Code.
> 3. Erosion and sediment control plan requirements.
>
>   a. An erosion and sediment control plan (ESCP) shall be required for:
>
>   i. Any project subject to a grading permit under Chapter 23.08, Excavating, Grading and Filling.
>
>   ii. Any project subject to a building permit or other permit issued by the county that the agency determines has the potential for significant erosion and/or significant nonstormwater discharges of sediment and/or construction site waste.
>
>   iii. The ESCP shall comply with County Code Section 24.04.625 and shall include information required in the most recent version of the MCSTOPPP ESCP applicant package.

Section 28.18.094 of the county municipal code requires implementation of permanent best management practices for new and redevelopment designed to protect water quality and reduce sediment loading as follows:

> The agency may require, as a condition of project approval, permanent controls designed to remove sediment and other pollutants and to mimic the pre-project site hydrology by controlling the flow rates and/or the volume of stormwater runoff from the project's added and/or replaced impervious surfaces. These controls may include limits on impervious area. The selection and design of such controls shall be in general accordance with criteria established or recommended by federal, state and local agencies, and where required by the agency, the BASMAA Post Construction Manual. Where physical and safety conditions allow, the preferred control measure is to retain drainageways above ground and in as natural a state as possible or other biological methods such as bioretention areas. For each new development and redevelopment project subject to phase II stormwater permit provision E.12, or where required by the nature and extent of a proposed project and where deemed appropriate by the agency, every applicant shall develop, submit and implement a stormwater control plan (SCP) according to the requirements in Section 24.04.627.

Section 24.04.627 of the Marin Municipal Code implements requirements of the NPDES Small MS4 General Permit by requiring all projects regulated by Section E.12 of the NPDES Small MS4 General Permit to implement a stormwater control plan. Requirements of the stormwater control plan include but are not limited to

1. that the stormwater control plan follows the appropriate template in the BASMAA Post Construction Manual
2. the specific practices proposed in the stormwater control plan shall be in general accordance with the BASMAA Post Construction Manual, and the phase II stormwater permit.
3. an operation and maintenance plan.

Napa County

Napa County Municipal Code

Chapter 16.28 of the Napa County Municipal Code contains the Napa County Stormwater Management and Discharge Control Ordinance, the purposes of which are to protect the health, safety and general welfare of Napa County residents; to protect water resources and to improve water quality; to protect and enhance watercourses, fish, and wildlife habitat; to cause the use of management practices that will reduce the adverse effects of polluted runoff discharges; to secure benefits from the use of stormwater as a resource; and to ensure the county is compliant with applicable state and federal law. The Ordinance enables Napa County to establish controls on the volume and rate of stormwater runoff from any developments or construction projects as may be appropriate to minimize peak flows or total runoff volume, and to mimic the pre-development site hydrology. These controls may include limits on impervious area dimensions, quantities or locations, and/or provisions for detention and retention of runoff on-site.

The County may require, as a condition of project approval, permanent structural controls designed for the removal of sediment and other pollutants and for control on the volume and rate of stormwater runoff from the project's added or replaced impervious surfaces. The selection and design of such controls shall be in accordance with criteria established or recommended by federal, state, local agencies, and where required, the BASMAA Post Construction Manual or any other standards as adopted by resolution of the board of supervisors. Where physical and safety conditions allow, the preferred control measure is to retain drainageways above ground and in as natural a state as possible, or other biological methods such as bioretention areas.

Chapter 16.28 also requires any person performing construction activities to implement appropriate BMPs to prevent the discharge of construction wastes or contaminants from construction materials, tools and equipment from entering a storm drain or watercourse. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices, such as the California Stormwater Quality Association's Construction BMP Handbook or other standards and practices as established by resolution of the board of supervisors. Erosion and Sediment Control Plans are required for any project subject to a grading permit, or subject to another county permit such as projects within fifty feet of a storm drain, projects disturbing ten thousand square feet of soil or more, or any other project required by the County.

Napa County General Plan

The Napa County General Plan includes the following goals and policies relevant to surface hydrology:

Goal SAF-4: To protect residents and businesses from hazards caused by flooding.

> ***Policy SAF-23*:** New construction in flood plains shall be evaluated and placed above the established flood elevation or flood-proofed to minimize the risks of flooding and provide protection to the same level as required under County's Floodplain Management Ordinance.

***Policy SAF-25*:** The review of new proposed projects in a floodway as mapped on the County's Flood Insurance Rate Maps (FIRM)3 (Figure SAF-3) shall include an evaluation of the potential flood impacts that may result from the project. This review shall be conducted in accordance with the County's FEMA approved Flood Plain Management Ordinance, incorporated herein by reference, and at minimum include an evaluation of the project's potential to affect flood levels on the Napa River; the County shall seek to mitigate any such effects to ensure that freeboard on the Napa River in the area of the Napa River Flood Protection Project is maintained.

Sonoma County

Sonoma County Municipal Code

Chapters 11 and 11A of the Sonoma County Municipal Code include provisions relevant to surface hydrology. Section 11.16.030 describes requirements for management of storm water and design and construction of drainage facilities. Grading, drainage improvement, and vineyard and orchard site development shall include the drainage facilities or other methods necessary to manage storm water in compliance with the permit authority's best management practices guide. Grading and drainage improvement shall maintain natural and existing drainage patterns. Post-development runoff for construction grading and construction drainage improvement shall not exceed pre-development runoff using the calculation methodologies in the Storm Water Low Impact Development Technical Design Manual, or superseding document, or equivalent calculation methodologies.

Chapter 11A, Stormwater Quality, states that any construction contractor performing work in the applicable area shall implement appropriate best management practices to prevent the discharge of construction wastes or debris or contaminants from the construction materials, tools, and equipment from entering the stormwater system. In addition, where best management practice guidelines or requirements have been adopted or published by the Environmental Protection Agency, any state of California agency, any San Francisco Bay area agency, or the county, for any activity, operation or facility that may cause or contribute to prohibited discharges, every person undertaking such activity or operation or owning or operating such commercial facility shall comply with such guideline or requirement.

Chapter 7B, Flood Damage Prevention, applies to all areas of special flood hazard identified in the FEMA Flood Insurance Rate Maps. The following general standards are required in all areas of special flood hazard:

Construction Materials and Methods

1. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
2. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

Utilities

1. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of *flood* waters into the systems

Sonoma County General Plan

The Sonoma County General Plan includes the following goals and objectives related to surface hydrology:

Goal PS-2: Reduce existing flood hazards and prevent unnecessary exposure of people and property to risks of damage or injury from flood hazards.

***Objective PS-2.2*:** Regulate new development to reduce the risks of damage and injury from known flooding hazards to acceptable levels.

City of Novato

Novato Municipal Code

The Novato Urban Runoff Pollution Prevention Ordinance is codified in Section 7-4 of the Novato Municipal Code. The intent of this section is to protect and enhance the water quality of the state's, and the nation's watercourses, water bodies, and wetlands in a manner pursuant to and consistent with the Clean Water Act. (33 U.S.C. Section 1251 et seq.), the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.), and the Phase II Small Municipal Separate *Storm* Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (Phase II Stormwater Permit) and subsequent revisions and amendments thereto. Any discharge that would result in or contribute to a violation of the Phase II Stormwater Permit and any amendment, revision or reissuance thereof, either separately considered or when combined with other discharges, is prohibited. Any person engaged in activities which will or may result in pollutants entering the city *storm* drains shall undertake all practicable measures to cease such activities, and/or eliminate or reduce such pollutants. Such activities shall include, but not be limited to, ownership and use of parking lots, gasoline stations, industrial facilities, commercial facilities, and ground disturbing activities.

Construction

Any person performing construction activities in the city shall implement appropriate BMPs to prevent the discharge of construction wastes or contaminants from construction materials, tools and equipment from entering the *storm* drain system or watercourse.

Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the *storm* drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, tarping of materials stored on site, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The city will provide references to current guidance manuals and BMP information on request. The use of erosion and sediment control BMP products that contain plastic monofilament netting shall not be allowed.

All construction plans and applications for construction activity submitted to the city shall consider the potential for erosion and sedimentation at the construction site, and shall include appropriate erosion and sedimentation controls.

Post-Construction

The city may also require, as a condition of project approval, permanent structural controls designed for the removal of sediment and other pollutants and for control on the volume and rate of stormwater runoff from the project's added or replaced impervious surfaces. The selection and design of such controls shall be in accordance with criteria established or recommended by state, federal, and local agencies, and where required, the BASMAA Post-Construction Manual. Where physical and safety conditions allow, the preferred control measure is to retain drainageways above ground and in as natural a state as possible or other biological methods such as bioretention areas.

For each new development and redevelopment project subject to the post-construction measures requirements, or where required by the nature and extent of a proposed project and where deemed appropriate by the city, every applicant shall submit a stormwater control plan (SCP) that meets the criteria in the most recent version of the BASMAA Post-Construction Manual, and shall implement conditions of approval that reduce

stormwater pollutant discharges through the construction, operation and maintenance of source control measures, low impact development design, site design measures, stormwater treatment measures and hydromodification management measures. Increases in runoff shall be managed in accordance with the post-construction measures requirements. Where projects are required to have a SCP, project applicants shall follow the appropriate SCP template, based on the project type, as set forth in the BASMAA Post-Construction Manual. All stormwater management facilities shall be designed in a manner to minimize the need for maintenance and reduce the chances of failure. Design guidelines are outlined in the BASMAA Post-Construction Manual. All stormwater management facilities shall be maintained according to the BASMAA Post-Construction Manual and the approved stormwater facilities operation and maintenance plan.

Novato General Plan

The 1996 Novato General Plan includes the following policies related to surface water hydrology:

SF Objective 3: Reduce flood hazards

SF Policy 4: Enhanced Floodwater Storage. Support measures to manage, protect and increase the floodwater storage capacity where appropriate.

SF Policy 8: Reducing Flood Hazards. Reduce flood risk by maintaining effective flood drainage systems and regulating construction.

SF Program 8.1: Condition new development to maintain post development peak runoff rate and average volume similar to the predevelopment condition, to the maximum extent practicable.

SF Program 8.2: Require runoff rate/volume analysis of projects where deemed necessary by City staff.

SF Program 8.3: Require all development in the 100 year flood zone to comply with the Floodplain Zoning requirements in the Novato Municipal Code.

SF Program 8.5: Require analysis of the cumulative effects of development upon runoff, discharge into natural watercourses, and increased volumes and velocities in watercourses and their impacts on downstream properties. Include clear and comprehensive mitigation measures as part of project approvals with financial and other measures to ensure their implementation.

SF Program 9.3: Require, where necessary, construction and maintenance of siltation/detention ponds to be incorporated into the design of development projects.

S F Policy 10: Hazards of Dam and Levee Failure. Ensure that the design and location of dam s and levees are in accordance with all applicable design standards of the California Division of Safety of Dams.

SF Policy 11: Rising Sea Level. Consider the potential for sea level rise when processing development applications that might be affected by such a rise.

SF Program 11.1: Work with the County Flood Control and Water Conservation District to prepare a plan for responding to a potential rise in sea level. Consider developing flood control projects and modifying the City's land use regulations for areas subject to increased flooding from sea level rise.

EN Policy 1: Ecology of Creeks and Streams. Preserve and enhance the ecology of creeks and streams.

EN Program 1.1: Establish Stream Protection Zone for watercourses shown on EN Map 1 and their significant tributaries. The width of the Stream Protection zone shall include the watercourse itself between the tops of the banks (existing height) and a strip of land extending 50 feet laterally outward from the top of each bank. Include provisions to extend the Stream Protection Zone where critical habitat areas and riparian vegetation exist and can be restored, wherever feasible, or to reduce the zone if physical conditions so warrant. E stablish standards to protect riparian habitat, water quality, provide long-term flood management and establish continuous wildlife corridors. Require a perm it for any excavation,

filling, or grading; rem oval or planting of vegetation; construction, alteration, or removal of any structure; or alteration of any embankment that is proposed in the Stream Protection Zone. Perm its shall include mitigations to protect wildlife and to protect enhance, and restore native vegetation. The permit shall take into account aesthetic, scenic, environmental, and recreational impacts or benefits

EN Policy 4: Erosion Control. Minimize soil disturbance and surface run off in the Stream Protection Zones. Pursuant to the City's grading ordinance, work in and adjacent to the zones shall be conducted during the dry season only, at times when the Community Development Department determines that surface runoff will be minimal or containable.

EN Policy 8: Environmentally Sound Flood Control Measures. Encourage flood control measures that retain the natural features and conditions of watercourses to the maximum feasible extent.

City of Petaluma

Petaluma Municipal Code

Stormwater management and pollution control provisions are included in the City of Petaluma's municipal code, discussed in Section 3.5, Water Quality. In particular, Section 15.80.150 relates to surface water hydrology:

To minimize the discharge of pollutants to the MS4, industrial and commercial facilities must install, implement, and maintain BMPs consistent with the California Stormwater Quality Association Best Management Practice Handbooks or equivalent.

The city may adopt additional requirements identifying appropriate BMPs including, but not limited to, source control and post construction treatment control measures to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The selection and the design of the BMPs, including post-construction treatment control measures, shall be per the city's stormwater policy and design standards and per the applicable NPDES permit issued to the city and other available guidance documents.

Final occupancy shall not be authorized until such time the BMPs and post-construction treatment measures are properly installed and provisions for long-term maintenance of these BMPs and treatment measures are accepted by the city.

In addition, Section 17.31.040 prohibits any person from discharging stormwater or non-stormwater to surface waters associated with any construction activity that is subject to the state's NPDES general construction permit without first having complied with the provisions contained in the state's NPDES general construction permit. Also prohibited is grading in such a manner so as to:

1. Cause erosion or sedimentation on other property or on public streets,
2. Obstruct or otherwise interfere with drainage, or deposit sediment in natural or artificial drainage facilities, or
3. Construct or alter drainage facilities or alter drainage courses without first obtaining a permit pursuant to chapter 17.31.060.

Petaluma General Plan

The Petaluma General Plan includes the following goals and policies relevant to surface hydrology:

Goal 8-G-8: Surface Water Management. Provide surface drainage and flood protection facilities to meet the community's needs of reducing flood hazards and potential property damage.

Policy 8-P-32: Areas within the Petaluma watershed, outside of the City of Petaluma, which are subject to periodic surface water inundation and containment, should not be modified in any manner to reduce the historic storage characteristics and capacity.

Policy 8-P-36: Require development on sites greater than 1/4 acre in size to demonstrate no net increase in peak day stormwater runoff, to the extent deemed practical and feasible.

Goal 8-G-11: Sustainable Site Planning. Improve natural hydrologic functions and water quality through sustainable site planning.

Policy 8-P-39: Consider, to the extent practicable, requiring sustainable site design practices as outlined in the 'Sustainable Site Planning' text box contained [in the General Plan].

City of American Canyon

American Canyon Municipal Code

Chapter 14.28, Stormwater and Pollution Discharge Control Program, of the American Canyon Municipal Code includes best management practices (BMPs) for ground-disturbing activities that must be implemented by any person performing construction activities in the city to prevent the discharge of sediment, construction wastes or contaminants from construction materials, and tools and equipment from entering a city storm drain or watercourse. The construction-phase BMPs include erosion and sediment controls, which may include but are not limited to scheduling and timing of grading activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. All construction plans and applications for construction activity shall consider the potential for erosion and sedimentation at the construction site, and shall include appropriate erosion and sedimentation controls, identified in an Erosion and Sediment Control Plan (ESCP). For projects subject to the State's General Construction Activity Stormwater Permit (CGP), project applicants may submit a Stormwater Pollution Prevention Plan (SWPPP) developed pursuant to the CGP in lieu of submitting an ESCP.

Chapter 14.28 also includes best management practices for new development and redevelopment (Section 14.28.082), including the following:

> Prior to and/or during construction, the authorized enforcement official may establish volume and rate of stormwater controls from new developments and redevelopment as may be appropriate to minimize peak flows or total runoff volume, and to mimic the pre-development site hydrology. These controls may include limits on impervious area or provisions for detention and retention of runoff on-site.
>
> The authorized enforcement official may require, as a condition of approval, permanent structural controls designed for the removal of sediment and other pollutants and for volume and rate of stormwater controls from the project's added or replaced impervious surfaces. The selection and design of such controls shall be in accordance with criteria established or recommended by federal, state, local agencies, and where required, the BASMAA Post Construction Manual and any issued Technical Bulletins.
>
> For each new development and redevelopment project subject to post construction measures requirements, or where required by the nature and extent of a proposed project and where deemed appropriate by the city, applicants shall submit a Stormwater Control Plan (SCP) that meets the criteria in the most recent version of the BASMAA Post Construction Manual.

Applicants shall implement the controls identified in the SCP and required by conditions of approval that reduce stormwater pollutant discharges through the construction, operation and maintenance of source control measures, low impact development design, site design measures, stormwater treatment measures and hydromodification management measures. Increases in runoff shall be managed in accordance with the post construction requirements.

All stormwater management facilities shall be maintained according to the approved Stormwater Facilities Operation and Maintenance Plan.

American Canyon General Plan

The American Canyon General Plan includes the following goals and objectives relevant to surface hydrology:

Goal 10: Protect the lives and property of American Canyon's residents and visitors from flood hazards.

***Objective 10.1*:** Design both new development and redevelopment projects in a manner that minimizes hazards associated with flooding.

Goal 8A: Maintain the quality of surface and subsurface water resources within the City of American Canyon and its Planning Area.

***Objective 8.7*:** Ensure that the natural character of streams and creeks is maintained.

***Objective 8.8*:** Prevent degradation of surface water quality due to erosion.

***Objective 8.9*:** Prevent development from degrading the ground water and surface water resources in American Canyon's Planning Area.

City of Napa

Napa Municipal Code

Chapter 8.36, Storm Water Quality Control, of the Napa Municipal Code includes provisions applicable to construction activities. The person who possesses the title of the real property or the leasehold interest of the premises on which a construction activity will occur within the city shall prepare and submit an erosion and sediment control plan prior to and as a condition of issuing a grading or building permit. The erosion and sediment control plan shall contain, at a minimum, appropriate site-specific construction site BMPs, the rational used for selecting or rejecting BMPs, a quantification of expected soil loss from the BMPs, a list of applicable permits, and evidence that permits have been obtained. No construction activity shall commence before the Director issues written approval of the erosion and sediment control plan. A SWPPP developed pursuant to the Construction General Permit may substitute for the erosion and sediment control plan for projects where a SWPPP is developed. In such cases, the SWPPP must comply with this chapter and must be submitted to the city for review and approval.

Chapter 17.38, FP-Floodplain Management Overlay District, includes floodplain management regulations. All new construction and substantial improvement of structures shall be constructed and designed:

1. With materials and utility equipment resistant to flood damage;
2. Using methods and practices that minimize flood damage;
3. With electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located as to prevent water from entering or accumulating within the components during conditions of flooding;

4. With adequate drainage paths around structures on slopes to guide floodwaters around and away from structures; and

5. In compliance with FEMA Technical Bulletins 2-93, 3-93 and 7-93.

In addition, all new and replacement water supply, gas, electrical and sanitary sewage systems shall be designed:

1. To minimize or eliminate infiltration of floodwaters into the system and discharge from the system into floodwaters; and

2. To avoid impairment or contamination during flooding in the case of on-site waste disposal systems.

Napa General Plan

The Napa Plan includes the following goals and policies related to surface hydrology.

Goal HS-3: To reduce the risk to life and property from flooding.

Policy HS-3.2: The City shall continue to apply flood plain management regulations for development in the floodplain and floodway.

***Policy HS-3.6*:** The City shall support programs and methods to reduce the flooding of General the Napa River and its tributaries.

APPENDIX 3.3B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to surface hydrology.

POTENTIAL IMPACTS AND SIGNIFICANCE – SURFACE HYDROLOGY

	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.3.1: Changes in Drainage Patterns							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.3.2: Changes in Drainage Patterns – Flow Reductions							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.3.3: Flooding							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LS	LS
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.3.4: Flooding - Sea Level Rise							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.3.5: Inundation– Other Hazards							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action

Appendix 3.4
Groundwater

3.4A Setting and Regulatory Framework
3.4B Impact Summary by Service Area

APPENDIX 3.4A
Setting and Regulatory Framework

3.4.1 Affected Environment

Local Groundwater Conditions

Novato SD

MMWD and NMWD provide water service within this area of Marin County. DWR's *Bulletin 118* identifies one groundwater basin in the Novato SD service area that is discussed below.

Novato Valley Groundwater Basin

The Novato Valley is a depression in Marin County in the Coast Ranges west of San Pablo Bay and north of San Rafael (see **Figure 3.4-1** in **Appendix A**). San Antonio Creek forms the northern boundary of the groundwater basin and the Mendocino Range forms the western and southern boundary. The Novato Valley groundwater basin encompasses approximately 32 square miles.

Geology and Hydrogeology. Water bearing formations in the Novato Valley groundwater basin are mainly in alluvial deposits of Pleistocene to Holocene age that overlie non-water bearing rocks of the Franciscan assemblage (Cardwell, 1958 *in* DWR, 2004). Alluvial deposits consist of unconsolidated clay, silt, and sand with discontinuous lenses of gravel. Pleistocene alluvium is exposed in a small area in the northern side of the valley (Cardwell, 1958 *in* DWR, 2004). Alluvial deposits range in thickness from 60 feet near the City of Novato to 200 feet near San Pablo Bay (DWR, 1975 *in* DWR, 2004). Semi-confined conditions generally occur in the water bearing formations (Cardwell, 1958 *in* DWR, 2004).

Groundwater recharge occurs mainly from infiltration of streambeds and through direct percolation of precipitation that falls on the valley floor. Annual precipitation in the basin ranges from less than 20 inches near San Pablo Bay to more than 40 inches in upland areas of the Mendocino range (DWR, 2004).

Wells in sand and gravel layers 25 to 50 feet deep within the basin have an average yield of 50 gallons per minute (DWR, 1975 *in* DWR, 2004).

Groundwater Production. No groundwater production information is available for this basin.

Groundwater Levels. No information is available for groundwater levels in this basin; however, groundwater depth information from DWR is available for the Sears Point area and is discussed below.

Table A3.4-1 presents available groundwater data for the Sears Point area. Average water depth is 2.5 to 58.6 feet bgs, with a minimum depth of 1.5 feet and a maximum depth of 117.7 feet bgs.

Groundwater Quality. Groundwater in the basin is high in calcium bicarbonate. Groundwater in the tidal areas of the basin has higher levels of sodium chloride and total minerals than groundwater farther away from San Pablo Bay (Cardwell, 1958; DWR, 1975 in DWR, 2004). Brackish water intrusions into the groundwater from tidal fluctuations are a main concern in the area around San Pablo Bay and can degrade groundwater quality (Cardwell, 1958 *in* DWR, 2004).

TABLE A3.4-1: GROUNDWATER DEPTHS IN THE SEARS POINT AREA

Well Location/ID	Period of Record		Below Ground Surface (feet)		
	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
03N06W11L001M	10/12/1989	11/1/1995	4.0	3.5	4.5
04N06W21A001M	12/1/1989	3/18/2002	58.6	54	70.2
04N06W27B001M	10/13/1980	3/18/2002	28.1	7	117.7
04N06W36N001M	12/1/1989	11/30/1999	19.1	16.6	21.9

SOURCE: DWR, 2008

SVCSD

Groundwater makes up approximately 60 percent of all water used within the Sonoma Valley. The majority of groundwater used in the Sonoma Valley is for agricultural irrigation (44 percent), followed by municipal and commercial uses (33 percent), rural domestic uses (19 percent), and golf course and parks (4 percent) (SCWA, 2014). Groundwater provided less than 1 percent of the City of Sonoma's water supply and 27 percent of VOMWD supply in 2000 (Booker, 2006; SCWA, 2001a *in* CDM, 2008).

Sonoma Valley Groundwater Subbasin

Located in the southeastern portion of Sonoma County, the Sonoma Valley is a northwest trending depression between the Sonoma and Mayacmas Mountains. The Sonoma Creek watershed encompasses approximately 166 square miles and discharges to San Pablo Bay via Sonoma Creek. Water demand in the area is met with a combination of imported surface water from the Russian River, groundwater, and recycled water. Over the past 30 years, an increase in irrigated agriculture and rapid population growth have led to an increase in groundwater pumping and localized declining groundwater levels in some areas (SCWA, 2007; Farrar et al., 2006). Current groundwater issues for the Sonoma Valley groundwater subbasin include declining groundwater levels in confined aquifers of southern Sonoma Valley, potential intrusion of brackish groundwater, and upwelling of geothermal waters.

Geology and Hydrogeology. All geologic formations in the Sonoma Valley contain groundwater, but differ in their water bearing properties. The four primary geologic units include Quaternary Alluvial Units, the Glen Ellen Formation, the Huichica Formation, and the Sonoma Volcanics. **Table A3.4-2** presents the characteristics of these water bearing formations. Bay Mud deposits cover the southern area of the valley to San Pablo Bay. Due to low permeability and high salinity, Bay Mud is not considered an aquifer for water supply (SCWA, 2007).

Groundwater recharge in Sonoma Valley occurs mainly through precipitation, by way of seepage from surface water bodies, and direct infiltration of precipitation. Minor recharges can occur from infiltration from septic tanks, leaking water supply infrastructure, and irrigation (Farrar et al., 2006). Precipitation in the valley occurs as rain, with almost 90 percent occurring during November through April. Annual precipitation for the City of Sonoma had an average of 29.8 inches for water year 1953 through 2002, but can vary significantly from the 50-year average (National Oceanic and Atmospheric Administration 2003 *in* Farrar et al., 2006). Groundwater movement is generally from the mountain ridges down toward the valley axis and from the northwest end of the valley southeast toward San Pablo Bay (Farrar et al., 2006).

Groundwater pumping is assumed to be the main source of groundwater discharge, although groundwater also discharges from springs and to streams. Groundwater also discharges to the marshlands near San Pablo Bay by evaporation and transpiration from plants, and some water discharges to several sloughs that drain the marsh (Farrar et al., 2006).

TABLE A3.4-2: WATER BEARING FORMATIONS OF THE SONOMA VALLEY GROUNDWATER SUBBASIN

Formation	General Characteristics	Yield (gallons per minute)
Quaternary Alluvial Units	a. Consist of cobbles, sand, silt, and clay interlaced with coarse-grained stream channel deposits near Sonoma Creek. b. Unconfined.	100
Glen Ellen Formation	a. Clay-rich stratified deposits of poorly sorted sand, silt, and gravel, interbedded with minor beds of conglomerate and volcanic tuffs. b. Interspersed with the Huichica Formation and lies on top of the Sonoma Volcanics and Franciscan Complex in certain regions. c. Confined to semi-confined.	20
Huichica Formation	a. Thick silt and clay with interbedded lenses of sands, gravels, and tuff beds. b. Overlies the Sonoma Volcanics. c. Confined to semi-confined.	2 to 20, higher yields in the lower part of the unit.
Sonoma Volcanics	a. Volcanic rocks interbedded with sedimentary deposits derived from volcanic rocks and lake beds. b. Overlies sedimentary rock. c. Confined to semi-confined.	10 to 50, up to 100.

SOURCE: SCWA, 2007; Farrar et al., 2006.

Groundwater Production. More than half of all water demand in the valley in 2012 was met with groundwater (SCWA, 2014). Groundwater production in Sonoma Valley was estimated at 10,500 acre-feet (AF) in 2012 (SCWA, 2014).

Groundwater Levels. Groundwater levels in Sonoma Valley have fluctuated over the last 100 years as major changes in recharge or discharge have occurred. In the 1880s to 1930s, a large area of salt marshes was drained and groundwater levels dropped in the southern portion of Sonoma Valley. When groundwater pumping increased substantially in the 1960s, groundwater levels declined and some wells were even reported to go dry (Farrar et al., 2006; SCWA, 2007). After deliveries of imported surface water from the Russian River began in 1965, groundwater levels appeared to recover and stabilize through the 1980s (DWR, 1982 in SCWA, 2007).

Since the 1980s, an increase in irrigated agriculture and rapid population growth have led to an increase in groundwater pumping and localized declining groundwater levels in some areas (SCWA, 2007). Currently there are two areas, one southeast of Sonoma and one southwest of El Verano, that show pumping depressions (Farrar, 2007). An increase in groundwater production and low precipitation in the last several years is the likely cause of this decline in groundwater levels in the valley (Farrar et al., 2006). There is currently no evidence to indicate any land subsidence in the Sonoma Valley (SCWA, 2007).

As shown in **Table A3.4-3** below, available data from DWR (2018) suggests average groundwater depths in the Sonoma Valley range between 3 feet and 131 feet bgs. The minimum groundwater depths recorded range from 0.0 to 103.1 feet bgs, and the maximum groundwater depths range from 11.6 to 179.0 feet bgs.

According to recent reporting, many shallow-zone wells have shown relatively stable long-term groundwater levels while a number of shallow-zone wells have exhibited declines during the last decade (SVGMP, 2016). More prevalent declining groundwater level trends were observed in deeper-zone wells. The most pronounced short-term declines were observed in wells located within the western and eastern highlands and within the El Verano/Fowler Creek and City subareas (SVGMP, 2016). Most of the groundwater level declines are considered to have resulted due to increased withdrawals in localized areas from increased groundwater demands by both agricultural and rural domestic pumping.

TABLE A3.4-3: GROUNDWATER DEPTHS IN SONOMA VALLEY SUBBASIN

Well Location/ID	Period of Record[a]		Below Ground Surface (feet)		
	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
Central Sonoma Valley					
06N06W09Q001M	10/9/1980	1/25/2018	14.2	6.2	47.6
06N06W10M002M	10/31/1974	3/14/2017	30.3	3.9	63.2
06N06W22R002M	10/9/1980	10/7/1990	3.4	0.0	11.6
06N06W23M002M	10/6/1980	3/13/2002	10.2	2.4	59.3
Sonoma Valley					
05N05W08P002M	4/3/1974	3/14/2017	89.8	8.7	179.0
05N05W17B002M	10/13/1980	3/14/2017	64.1	34.2	92.1
05N05W17C001M	1/18/1950	7/8/1994	15.2	5.8	30.4
05N05W18R001M	2/15/1966	1/25/2018	10.1	2.2	34.8
05N05W30J003M	10/22/1965	8/30/2000	12.5	0.0	70.0
05N06W02N002M	1/13/2012	1/25/2018	131.2	103.1	141.5
05N06W13C001M	10/8/1980	10/18/2016	37.7	24.8	64.8
Southern Sonoma Valley					
04N05W06E001M	11/29/1973	4/25/2000	22.1	18.1	30.1
04N05W06M001M	10/13/1980	3/14/2017	17.6	12.3	27.9

NOTES:
[a] Data for several wells includes gaps between years of measurements.

SOURCE: DWR, 2018

Groundwater Quality. Various sources contribute to salt and nutrient loading in this subbasin, including irrigation water, agricultural inputs, residential inputs, and animal waste (RMC, 2013). Generally, relatively low total dissolved solids concentrations (less than 500 mg/L) are observed throughout most of the subbasin, with the exception of an area of historical brackish groundwater at the southeastern portion of the subbasin (RMC, 2013). Areas of saline groundwater have been identified between San Pablo Bay shore and Schellville. This saline groundwater is likely associated with seawater intrusion, connate groundwater associated with evaporate or marine sedimentary deposits, and/or thermal waters (SCWA 2007). Low nitrate concentrations are generally observed throughout the subbasin (RMC, 2013).

MMWD

MMWD and NMWD provide water service within this area of Marin County. As described above, groundwater use in the MMWD and NMWD service area is limited because they do not have substantial underlying groundwater aquifers. The California Department of Water Resources' (DWR) Bulletin 118 identifies one groundwater basin in the service area that is discussed below.

San Rafael Groundwater Basin

The San Rafael Groundwater Basin is a 1.4-square mile coastal basin that underlies the City of San Rafael, in Marin County (**Figure 3.4-1, Appendix A**). The San Rafael Bay forms the eastern boundary of the basin (DWR, 2004a).

Geology and Hydrogeology. Primary water bearing units in the basin are unconsolidated Quaternary Alluvium. Annual precipitation in the basin averages 33 inches (DWR, 2004a).

Groundwater Production. Groundwater production information is unavailable for this basin (DWR, 2004a).

Groundwater Levels. Groundwater level information is unavailable for this basin (DWR, 2004a).

Groundwater Quality. Although no recent groundwater quality data is available, data collected in 1954 from a well east of the basin showed chloride concentrations exceeding 100 parts per million. It is unknown whether this data is typical of the area or if it indicates potential sea-water intrusion (DWR, 2004a). Data collected in 1972 suggested the possibility of sea-water intrusion from San Francisco Bay (DWR 1975 *in* DWR 2004a). In addition, urban areas where industrial and light industrial uses are located include areas where unauthorized releases of hazardous materials have adversely affected groundwater quality.

Napa SD

The City of Napa does not use groundwater for drinking water supplies. Unincorporated areas of Napa County that are not served by the City, including the MST area, rely on groundwater for domestic use as well as agriculture and open-space irrigation. Two groundwater basins have been identified in the Napa SD service area that could be affected by the NBWRP, the MST and Carneros groundwater basins. **Figure 3.4-2** (in **Appendix A)** shows the location of the Carneros and MST groundwater basins.

MST Groundwater Basin

The Lower MST Basin area is located on the eastern edge of the Napa Valley floor in southern Napa County, between the City of Napa and the Howell Mountains. The MST Basin covers an area of about 15 square miles and has an estimated usable storage of 200,000 AF (Napa Valley Flood Control District, 1991 in County of Napa, 2007). Groundwater level declines observed in the MST subarea have been notes as early as the 1960s and 1970s but have stabilized since 2009 (Luhdorff & Scalmanini, 2016). The MST Basin is the only basin designated as deficient by Napa County (County of Napa, 2007). The County of Napa has enacted an ordinance to protect groundwater in the MST deficient area.

Approximately 4,800 people in the MST area rely solely on groundwater from private wells. The majority of all groundwater pumped in the area (about 45 percent) is used for agriculture, with the remainder pumped for improved open-space irrigation (about 29 percent) and domestic use (about 27 percent) (Farrar and Metzger, 2003). Population growth and an increasing number of irrigated vineyards have resulted in declining groundwater levels.

Geology and Hydrogeology. The MST Basin lies in a northwest-trending valley in the Howell Mountains of the North Coast Range. The area is underlain by alluvial deposits and volcanic rocks that exceed 1,000 feet in thickness in some areas. Principal water bearing units in the area include alluvial deposits west of the Soda Creek Fault and the tuffaceous member of the Sonoma Volcanics east of the fault (Farrar and Metzger, 2003). Groundwater occurs primarily under confined conditions within the tuffaceous units of the Sonoma Volcanics (County of Napa, 2007).

City of Petaluma Ellis Creek Water Reclamation Facility

The Petaluma Valley Groundwater Sustainability Agency (GSA) is the public agency formed in 2017 to sustainably manage groundwater in the Petaluma Valley groundwater basin. DWR's *Bulletin 118* identifies one groundwater basin in the City of Petaluma service area that is discussed below. A technical study of groundwater resources within the Petaluma Valley Groundwater Basin is currently being conducted by the USGS, which is expected to be published in 2018.

Petaluma Valley Groundwater Basin

The Petaluma Valley Groundwater Basin occupies a structural depression in California's Coast Ranges immediately north of San Pablo Bay. The basin extends from San Pablo Bay northward to a series of low hills near the town of Penngrove. It is bounded on the west by the Mendocino Range and on the east by the Sonoma Mountains. Northwest trending folds and a few faults are the most important geologic structures of the Petaluma Valley. The Petaluma River is the principal stream draining the Petaluma Valley and is tidally influenced from its mouth at San Pablo Bay upstream to the town of Petaluma. Flow in the river reach above the tidewater is seasonal. Precipitation averages 24 to 28 inches in the valley and up to 40 inches in the highland areas northeast of the valley.

Geology and Hydrogeology. The Petaluma Valley Groundwater Basin is comprised of late Tertiary (2.58 – 65 million years ago) to Quaternary (2.58 million years ago to the present) age sedimentary deposits of marine and continental origin and volcanic rocks (Cardwell 1958 in DWR, 2014). The major water-bearing units in the basin are the Younger Alluvium, Older Alluvium, and the Wilson Grove (formerly Merced) Formation, while the Petaluma Formation typically has low yields and the Sonoma Volcanics has highly variable yields (DWR 1982 in DWR, 2014).

Groundwater is recharged mostly by the deep percolation of rainfall. Suitable recharge areas (those with slopes less than 15 percent and with sufficiently permeable materials) are concentrated northwest of the City of Petaluma and are also scattered on the western flank of the Sonoma Mountains to the east. The rate of recharge is generally slow, depending on the annual precipitation (DWR 1982 in DWR, 2014).

Groundwater Production. Groundwater extraction satisfied the City of Petaluma's water needs during the late 1950s and early 1960s. However, problems with salt water intrusion attributed to this municipal use resulted in groundwater pumpage being reduced in 1962 when water deliveries from the Russian River began. In the early 1980s, 15 percent (900 acre-feet/year) of the City of Petaluma's municipal water was supplied by groundwater. The City currently relies on the Sonoma County Water Agency to supply all of its water needs and City wells are used as an emergency backup. Groundwater remains the primary source of domestic and irrigation water in the unincorporated areas of Petaluma Valley.

Groundwater Levels. Ground water levels near the City of Petaluma dropped from the mid-1950's until the early 1960's. Seawater intrusion occurred in the alluvial fan deposits along the Petaluma River as a result of groundwater pumping. Groundwater levels began to recover after water was imported from the Russian River in 1962 and in some cases they have returned to historic high levels. Groundwater levels have remained steady with the exception of the 1976-77 drought, during which time water levels dropped an average of 10 feet below the normal annual low. Groundwater levels in monitored wells normally fluctuate 10 feet between spring and fall. In most cases, levels had returned to normal by spring 1978 (DWR 1982 *in* DWR, 2014).

American Canyon Water Reclamation Facility

The City of American Canyon is located over the Napa-Sonoma Lowlands Subbasin. The City does not currently use groundwater as a source of water, and the City did not pump groundwater at any time during the years 2011-2015 (Kennedy Jenks, 2016). Previous studies of groundwater productivity in and near the City have indicated that usable groundwater resources in the City may be limited; wells at depths up to 200 feet produce approximately 45 gallons per minute, with some having reliability issues in the dry months of the year; deeper wells (approximately 400 feet) have been found to have brackish water quality and not sustainable (City of American Canyon, 2011 in Kennedy Jenks, 2016). In the future, the City may explore groundwater as a municipal water source as opportunities present themselves; however, the City currently does not have any specific plans to use groundwater, and groundwater is not considered to be part of the supply portfolio for the Urban Watershed Management Planning period.

Groundwater recharge in the MST Basin occurs from precipitation and infiltration on the valley floor and from infiltration in the Howell Mountains. Seepage from the three creeks also contributes to recharge. Agricultural

irrigation has a minor contribution to recharge as the predominant crops are vineyards that use water-efficient irrigation techniques. Annual precipitation in the basin occurs almost exclusively from November through April. Annual precipitation averaged about 24.5 inches per year from 1918 through 2000 (National Oceanic and Atmospheric Association 2002 *in* Farrar and Metzger, 2003). Annual precipitation can deviate up to 200 percent from the 85-year average. Precipitation increases from south to north as the elevation increases. Average annual precipitation is highest in the Howell Mountain, almost 65 percent higher than the area with the lowest average annual precipitation (Farrar and Metzger, 2003).

Surface water resources in the area include the Milliken, Sarco, and Tulucay Creeks, which originate in the Howell Mountains and drain into the Napa River. The three creeks have a combined drainage area of approximately 41 square miles.

Groundwater generally moves laterally from the Howell Mountains into the MST area and towards the Napa River. Surface water runoff to the Napa River and high evapotranspiration rates make it difficult to accurately estimate potential groundwater recharge (Farrar and Metzger, 2003). A previous study estimated average annual recharge to be 5,400 AF per year (AFY) in 1975, with 3,050 AFY from streamflow infiltration, 2,100 AFY from subsurface inflow from the Howell Mountains, and 250 AFY from infiltration of precipitation (Farrar and Metzger, 2003). USGS estimates annual recharge to be approximately 6,000 AFY, but this number is uncertain due to the difficulty in estimating precipitation, runoff, and evapotranspiration for the region (Farrar and Metzger, 2003).

Groundwater discharges mainly occur from groundwater pumping and underflow in a westward direction, with a smaller quantity of discharges to streams (Farrar and Metzger, 2003). The USGS estimates underflow to be about 600 AFY in the area, about 2,050 AF less than estimated in 1975 (Farrar and Metzger, 2003).

Groundwater Production. Based on driller logs and the number of parcels in the area, USGS estimates there are approximately 1,595 domestic wells and 185 irrigation wells in the MST area (Farrar and Metzger, 2003). About one-third of all domestic wells were constructed from 1975 to 2002. Groundwater production from 2000-2002 ranged from 3,600 to 7,100 AFY and averaged 5,350 AFY. This production is an increase of 2,350 AFY compared to 1975 estimates which average 3,000 AFY (Farrar and Metzger, 2003). Annual groundwater pumping has been estimated at 5,350 AF from 2000-2002, an 80 percent increase since 1975 (Farrar and Metzger, 2003).

Groundwater Levels. As described above, prior to pumping, groundwater in the area flowed west toward the Napa River from recharge areas in the mountains to the north, east, and south. Increased groundwater pumping since 1975 has changed the groundwater gradients in the area, resulting in a decrease in underflow towards the Napa River. Three large groundwater depressions are present in the MST Basin; one in the eastern portion, one in the central portion, and one in the northwestern portion of the basin. The groundwater depressions are shown in **Figure 3.4-3 (Appendix A)**. Groundwater around the depressions that would normally have flowed in a southwest direction towards the Napa River now flows towards these depressions. From 1975 to 2001, some water levels increased in the area, but groundwater levels around the central and eastern depressions decreased from 50 to 124 feet bgs (Farrar and Metzger, 2003). The two largest groundwater depressions are located in regions with the largest number of active or potentially active wells (Farrar and Metzger, 2003). In the third depression in the northwest region, the greatest rate of groundwater decline occurred after 1970, when the largest numbers of new wells were drilled. The decrease in groundwater levels at the three depression areas has occurred even during periods of average annual precipitation. The general decline in groundwater levels suggest that groundwater pumping currently exceeds recharge (Farrar and Metzger, 2003).

However, according to recent reporting, overall, the groundwater level declines have stabilized since about 2008 with differing responses within the MST subarea (Luhdorff & Scalmanini, 2016). According to available data from DWR, average groundwater depths in the MST basin range from 14.1 to 227.5 feet bgs (see **Table A3.4-4**). The minimum groundwater depth recorded ranges from 0.3 feet to 180.0 feet bgs, while the maximum depth ranges from 59.4 to 285.9 feet bgs.

TABLE A3.4-4: GROUNDWATER DEPTHS IN THE MST BASIN

Well Location/ID	Period of Record		Depth Below Ground Surface (feet)		
	Start	End	Average Water Depth	Minimum Depth	Maximum Depth
05N03W05M001M	6/15/1949	04/20/2011	**129**	**47.5**	**223**
05N03W06B002M	11/9/1992	04/20/2011	231	180	287
05N03W07C003M	10/17/1978	4/23/2008	49	11.4	130
05N03W07P001M	10/17/1978	11/6/1992	77.6	1.7	213
05N04W12F001M	1/30/1950	3/20/1978	61.2	30.5	98.5
05N04W12H001M	4/4/1963	1/30/1978	48.3	10	88.6
05N04W13H001M	4/4/1963	04/19/2011	16.7	3.1	149.6
05N04W13H002M	7/17/1962	3/21/1972	14.1	11.8	20.8
05N04W14J003M	7/15/1920	04/19/2011	76	47.5	199.2
06N03W31B001M	12/15/1949	4/6/1992	137.4	69	230
06N03W31F001M	12/15/1919	10/15/1973	26.2	0.3	64.8
06N03W31H001M	12/15/1949	3/20/1978	67.4	14.6	145.9
06N03W31N001M	11/15/1937	10/1/1974	46.8	16.7	59.4
06N03W31N002M	4/4/1963	3/20/1978	60.6	24.9	98.2
06N04W23J001M	2/1/1950	04/19/2011	75.3	-0.3	125.1
06N04W23Q003M	10/17/1978	04/19/2011	85.7	12	122
06N04W26G001M	10/13/1978	04/20/2011	56.1	30.8	95.1
06N04W35G003M	1/31/1950	10/24/1988	35.4	4	85.5
06N04W36G001M	10/17/1978	04/20/2011	123.2	74.9	179.5
06N04W36H001M	3/10/1950	3/20/1978	28.8	15.4	127

SOURCE: DWR, 2017

Groundwater Quality. In the fall of 2001, USGS sampled 15 wells throughout the MST Basin. Several wells exceeded drinking water standards for various constituents. Dissolved oxygen (DO) concentrations in the wells ranged from less than 0.1 to 6.6 mg/L. The pH for all 15 wells ranged from 6.3 to 8.6; two wells did not meet the State secondary drinking water standard of 6.5 to 8.5 or for taste, odor, or appearance (Farrar and Metzger, 2003). Specific conductance ranged from 124 to 1,220 microsiemens per centimeter (µS/cm) and one well exceeded the State secondary drinking water standard of 900 µS/cm (USGS, 2003). More recent groundwater monitoring data from throughout the Napa Valley Floor suggest stable conditions between 2009 and 2015 compared to earlier reporting (Luhdorff & Scalmanini, 2016). Water quality exceedances in the Napa Valley Floor subareas were limited to the naturally-occurring arsenic with maximum concentrations above the drinking water standard of 10 micrograms per liter.

Boron standards were exceeded in two wells, and arsenic standards were exceeded in three wells. Several wells had concentrations of dissolved iron and manganese that exceeded drinking water standards. The source of the arsenic, boron, iron, and manganese is most likely minerals in the volcanic rocks or from the rocks of the Franciscan Complex or Great Valley Sequence. Groundwater from three wells in the central part of the basin, ranging in total depth from 228 to 260 ft, had the highest dissolved solids (greater than 400 mg/L) and highest chloride concentrations (54 to 175 mg/L) (Farrar and Metzger, 2003). Temperatures in the wells were fairly high, ranging from 17.5 degrees Celsius (°C) to 27 °C, with a temperature gradient almost double that of the

national average at approximately 0.02°C per foot. All wells with depths greater than 400 feet had a temperature over 22 °C (Farrar and Metzger, 2003).

3.4.2 Regulatory Framework

Federal

No federal laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of the NBWRP Phase 2 or alternatives to groundwater resources.

State

California Recycled Water Regulations

Recycled water has been used in California since the late 1800s. Public health restrictions have been in effect since the early part of this century. The regulations covering recycled water in California are found in California Health and Safety Code (CH&SC) Division 104, Part 12; California Water Code (CWC), Division 7; California Code of Regulations (CCR), Title 22, Division 4; and CCR, Title 17, Division 1, Chapter 5, Group 4.

California Health and Safety Code (CH&SC) Division 104, Environmental Health Services, Part 12, Drinking Water, Chapter 4, California Safe Drinking Water act, deals with recycled water only slightly. Article 2, Section 116815 states, "all pipes installed above or below ground, on or after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape. Subdivision (b) goes on to state, that this does not apply to water delivered for agricultural use.

The California Water Code states that recycled water, which as a result of treatment of waste is suitable for a direct beneficial use, or a controlled use that would not otherwise occur, is considered a valuable resource. Section 13510 states that the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state. Section 13520 states that recycling criteria are the levels of constituents of recycled water, and means for assurance of reliability under design concept, which will result in recycled water safe from the standpoint of public health.

Section 13521 states that the State Department of Health Services shall establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of the public health. Section 13551 states that no one shall use sources of potable water for non-potable uses, including cemeteries, golf courses, parks, highway landscapes and irrigation when suitable recycled water is available. Section 13625 through 13632 give requirements for competency of wastewater treatment employees. Section 13627 states, supervisors and operators of wastewater treatment plants shall possess a certificate of appropriate grade in accordance with, and to the extent recommended by the advisory committee required by, regulations adopted by the state board.

Title 22 California Code of Regulations, Division 4, Chapter 3 defines water-recycling criteria. Article 3, Section 60304 states includes requirements for recycled water used for surface irrigation.

Groundwater Management Act

Groundwater use is generally not regulated by the State of California. Groundwater use is typically managed at the local level. The State's role in groundwater management is mainly to provide financial assistance to local agencies to aid in groundwater management (DWR 2003).

Assembly Bill 3030 (AB3030), Water Code Section 10750 (commonly referred to as the Groundwater Management Act), encourages local agencies to develop groundwater management plans that cover certain aspects of management. Subsequent legislation has amended this chapter to make the adoption of a management program mandatory if an agency is to receive public funding for groundwater projects, creating an incentive for the development and implementation of plans. The Groundwater Management Act lists 12 elements that should be included within the groundwater management plans to ensure efficient use, good groundwater quality, and safe production of water. These 12 elements are (State Water Code, Section 10753):

1. Control of saline water intrusion;
2. Identification and management of well head protection areas and recharge areas;
3. Regulation of the migration of contaminated groundwater;
4. Administration of a well abandonment and destruction program;
5. Mitigation of conditions of overdraft;
6. Replenishment of groundwater extracted by water producers;
7. Monitoring of groundwater levels and storage;
8. Facilitation of conjunctive use operations;
9. Identification of well construction policies;
10. Construction and operation (by the local agency) of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects;
11. Development of relationships with State and Federal regulatory agencies; and
12. Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination.

Senate Bill 1938 (SB 1938), Water Code Section 10753.7, requires local agencies seeking State funds for groundwater construction or groundwater quality projects to have the following: 1) a developed and implemented groundwater management plan that includes basin management objectives[1] (BMOs) and addresses the monitoring and management of groundwater levels, groundwater quality degradation, inelastic land subsidence, and surface water/groundwater interaction; 2) a plan addressing cooperation and working relationships with other public entities; 3) a map showing the groundwater subbasin the project is in, neighboring local agencies, and the area subject to the groundwater management plan; 4) protocols for the monitoring of groundwater levels, groundwater quality, inelastic land subsidence, and groundwater/surface water interaction; and 5) groundwater management plans with the components listed above for local agencies outside the groundwater subbasins delineated by the DWR Bulletin 118, published in 2003 that is currently being updated.

Groundwater Elevation Monitoring CASGEM

Senate Bill 76, an amendment made to the California Water Code in November 2009, mandated a statewide groundwater elevation monitoring (CASGEM) program to monitor seasonal and long- term trends in groundwater elevations in the alluvial groundwater basins throughout California (California DWR, 2018). The collection and evaluation of groundwater elevation data is done through collaboration between local monitoring entities and the Department of Water Resources. SBx7 6 requires DWR to report to the governor and legislature every 5 years beginning in 2015. Specifically, SBx7 6 states:

1 BMOs are management tools that define the acceptable range of groundwater levels, groundwater quality, and inelastic land subsidence that can occur in a local area without causing significant adverse impacts.

1. Local parties may assume responsibility for monitoring and reporting groundwater elevations. DWR must work cooperatively with local monitoring entities to achieve monitoring programs that demonstrate seasonal and long-term trends in groundwater elevations.
2. DWR accepts and reviews prospective monitoring entity submittals, determines the designated monitoring entity, notifies the monitoring entity, and makes that information available to the public.
3. DWR performs groundwater elevation monitoring in basins where no local entity has agreed to monitor.
4. If local parties do not volunteer to perform the monitoring functions, and DWR assumes those functions, then those parties become ineligible for water grants or loans from the state.

Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act (SGMA) is a three-bill package made up of AB 1739, SB 1319, and SB 1168 that was signed on September 16, 2014. SGMA allows local agencies to customize groundwater sustainability plans to meet their specific regional needs. It enhances local management of groundwater consistent with rights to use or store groundwater, provides local groundwater agencies with the authority, and technical and financial assistance needed to maintain groundwater supplies, avoids or minimizes impacts for land subsidence, increases groundwater storage and removes impediments to recharge, improves data collection, establishes minimum standards for effective, continuous groundwater management, and empowers local agencies to manage groundwater basins while minimizing state intervention. The legislation lays out a process and timeline for local agencies to achieve sustainability, including:

1. Local agencies must form local groundwater sustainability agencies (GSAs) within 2 years (i.e., 2017).
2. Local agencies in basins deemed medium and high priority must prepare groundwater sustainability plans (GSPs) within 5 to 7 years (2020 or 2022 depending on the overdraft status of the basin).
3. When plans are in place, local agencies must implement the GSPs and achieve sustainability within 20 years.

The deadline for GSA formation in high and medium priority groundwater basins and sub-basins is June 30, 2017. If a local agency chooses to be a GSA, it must hold a public hearing in the county or counties overlying the basin and send a notice of intent to DWR within 30 days of forming or electing to be a GSA. There is a 90-day period following the posting of the GSA formation by DWR where the GSA is presumed to be the exclusive GSA within the given area of the basin unless another notice is submitted. Currently, there is no deadline for implementing a GSP. However, by June 16, 2016, DWR will have adopted emergency regulations for evaluation and implementing GSPs that will outline the GSP components. Once a GSP is implemented, on April 1 of the year following the adoption of a GSP and annually thereafter, the GSA will submit an annual groundwater report to DWR.

Local

The local general plans, policies, and regulations associated with groundwater within the affected jurisdictions are presented below.

Marin County

Marin Countywide Plan

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Policy WR-1.1: Protect Watersheds and Aquifer Recharge. Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.

WR-1.2 Restore and Enhance Watersheds. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.

WR-1.3 Improve Infiltration. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.

WR-1.4 Protect Upland Vegetation. Limit development and grazing on steep slopes and ridgelines in order to protect downslope areas from erosion and to ensure that runoff is dispersed adequately to allow for effective infiltration.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

Goal WR-3: Adequate Water for Wildlife and Humans. Ensure that the available supply of surface and groundwater is used responsibly, so that the needs of both wildlife and human populations are met.

City of San Rafael

San Rafael General Plan

S-25. Regional Water Quality Control Board (RWQCB) Requirements: Continue to work through the Marin County Stormwater Pollution Prevention Program to implement appropriate Watershed Management plans as dictated in the RWQCB general National Pollutant Discharge Elimination System permit for Marin County and the local stormwater plan.

S-25a. Compliance with RWQCB. Review development plans for compliance with RWQCB permit, in conjunction with Marin County Stormwater Pollution Prevention Program (MCSTOPP).

City of Novato

Novato General Plan

Goal EL 1: Preserve, enhance and restore natural areas, including Novato's scenic hillsides, waterways, riparian corridors and baylands.

EL 1: Ecology of Creeks and Streams. Preserve and enhance the ecology of creeks and streams, including riparian vegetation. Prohibit further degradation and require restoration of previously-degraded riparian areas as a condition of development approval when restoration is feasible, taking into account the project's size and cumulative impacts.

EL 1a: Waterway and Riparian Protection. Ensure that new development complies with the requirements of the Waterway and Riparian Protection ordinance in the Zoning Code for watercourses shown on Figure EL-1.

PF 3: Water Supply. Work with the North Marin Water District to ensure an adequate water supply for new and existing development.

PF 3a: Water Conservation. Assist the North Marin Water District in implementing water conservation programs for Novato residents and businesses. Use treated wastewater for irrigation of City facilities and expansion of the recycled water system to the maximum extent practical.

Sonoma County

Sonoma County General Plan

Goal LU-8: Protect Sonoma County's water resources on a sustainable yield basis that avoids long term declines in available surface and groundwater resources or water quality.

***Objective LU-8.1*:** Protect, restore, and enhance the quality of surface and groundwater resources to meet the needs of all beneficial uses.

***Objective LU-8.2*:** Coordinate with operators of public water systems to provide an adequate supply to meet long term needs consistent with adopted general plans and urban water management plans.

***Objective LU-8.3*:** Increase the role of water conservation and re-use in meeting the water supply needs of both urban and rural users.

***Objective LU-8.4*:** Participate in the review of new proposals for surface and groundwater imports and exports in order to provide consistency with Sonoma County's ability to sustain an adequate water supply for its water users and natural environment.

***Objective LU-8.5*:** Improve understanding and sound management of water resources on a watershed basis.

***Policy LU-8a*:** Require that new development comply with applicable waste discharge requirements and minimize pollution of storm water, surface water and groundwater.

***Policy LU-8d*:** Work with SCWA and other public water suppliers in the development and implementation of master facility plans, urban water management plans, and other long term plans for water supply, storage, and delivery necessary to meet water demands of existing urban and rural users and planned growth, consistent with the sustainable yield of water resources.

***Policy LU-8h*:** Support use of a watershed management approach for water quality programs and water supply assessments and for other plans and studies where appropriate.

City of Petaluma General Plan

GOAL 8-G-1: Water Supply and Demand Provide a safe, reliable, high-quality, economical and sustainable source of water to meet the community's needs.

Goal 8-G-3: Recycled Water Maximize the use of recycled water as a potable water offset to manage water demands, and meet regulatory requirements for wastewater discharge.

Goal 8-G-4: Wastewater Manage the wastewater collection and treatment system to address 100 percent capture and treatment of the City's wastewater in an economically and ecologically sound manner.

Goal 8-G-5: Water Conservation Maximize water conservation measures to improve water use efficiency and reduce overall water demand.

Goal 8-G-6: Groundwater Supply Preserve and maintain the City's groundwater resources.

Policies and Programs:

***8-P-19*:** Ensure adequate water supply during emergency situations by developing potential groundwater resources and aquifer storage capacity, combined with management of surface water, to meet overall emergency water supply objectives. The City's groundwater resources shall be preserved to meet emergency needs and to offset peak demands.

A. The City will develop additional wells to supply the average minimum month water demand.

B. Work cooperatively with the County of Sonoma to protect and preserve Petaluma groundwater resources, including the preservation and enhancement of significant recharge areas within the watershed.

C. Evaluate the need and feasibility of developing limited wellhead treatment facilities to insure water quality requirements.

D. Preserve oak woodlands, upland native grassland, and wetland areas identified as contributing to groundwater recharge; at a minimum for areas identified within the Groundwater Feasibility Study, Technical Memo 4, dated February 2004 (Technical Appendix Volume 4).

***8-P-20*:** Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and stream sides from urban encroachment within the Petaluma watershed.

A. Control construction of impervious surfaces in groundwater recharge areas. Potential recharge area protection measures at sites in groundwater recharge areas include, but are not limited to: Restrict coverage by impervious materials; Limit building or parking footprints; Require construction of percolation ponds on site. Require surface drainage swales

B. Urge the County when reviewing development applications, to examine the combined impacts of new septic tanks placed in proximity to wells and the ability to maintain adequate protection of groundwater resources. The County should examine the cumulative impacts of the allowed development densities in the West Petaluma Specific Plan area and compare the results to established water quality standards. Test wells should be required prior to issuing any building permits.

***8-P-21*:** Protect groundwater quality from surface contamination by requiring 100 foot sanitary seals on all new municipal water supply wells.

City of Sonoma General Plan

Goal ER-2: Identify, preserve, and enhance important habitat areas and significant environmental resources.

***Policy 2.4*:** Protect Sonoma Valley watershed resources, including surface and ground water supplies and quality.

2.4.1: Prepare and implement a comprehensive strategy for water conservation and the protection of water quality, including quantified objectives, with the goal of producing a Water Element for the General Plan.

2.4.2: Update the Development Code to ensure that new development incorporates applicable "best-management" construction and post-construction practices and design features, including maintenance programs where warranted, that provide quantified results in reducing run-off and protecting water quality.

2.4.3: Work with the Sonoma County Water Agency, the Valley of the Moon Water District, the Sonoma Ecology Center and other appropriate agencies to monitor groundwater resources and to develop a ground water management plan, including guidelines and standards for preserving and enhancing valley watershed and surface and groundwater resources.

***Policy 2.5*:** Require erosion control and soil conservation practices that support watershed protection.

Napa County

The Napa County General Plan identifies the following policies that pertain to groundwater resources:

***Policy AG/LU-74*:** Notwithstanding AG/LU-25, the County supports the extension of recycled water to the Coombsville area to reduce reliance on groundwater in the Milliken-Sarco-Tulocay (MST) area.

***Policy CON-1*:** The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

***Policy CON-60*:** The County shall promote cost-effective water conservation and water efficiency measures that reduce water loss, waste, and water demand through the following measures:

a) Taking a leadership role in water conservation efforts, by monitoring and publicly reporting on the County's water use, using low flow fixtures, drought-tolerant landscaping, drip irrigation, recycled water use where available and appropriate, periodic water use "audits" and other strategies to conserve water at all County-owned and operated facilities.

b) Requiring the use of water conservation measures in areas served by municipal supplies to improve water use efficiency and reduce overall demand including, but not limited to, working cooperatively with all water providers and with developers to incorporate water conservation measures into project designs (e.g., as recommended by the California Urban Water Conservation Council), and coordination with water providers to continue to develop and implement water drought contingency plans to assist County citizens and businesses in reducing water use during periods of water shortages and emergencies.

c) Seeking cooperative partnerships with government agencies, non-profit organizations, private industry groups, and individuals in furthering water conservation strategies in Napa County.

***Policy CON-62*:** As stated in Policy AG/LU-74, the County supports the extension of recycled water to the Coombsville area to reduce reliance on groundwater in the MST groundwater basin and exploration of other alternatives. Also, the County shall identify and support ways to utilize recycled water for irrigation and non-potable uses to offset dependency on groundwater and surface waters and ensure adequate wastewater treatment capacity through the following measures:

a) Require (as part of continued implementation of County Code Title 13 Division 2 provisions associated with sewer systems) verification of adequate wastewater service for all development projects prior to their approvals. This requirement includes coordination with wastewater service purveyors to verify adequate capacity and infrastructure either exists or will be available prior to operation of the development project.

b) Use wastewater treatment and reuse facilities where feasible to reclaim, reuse, and deliver treated wastewater for irrigation and possible potable use depending on wastewater treatment standards.

c) Require proposals for non-residential construction in the Airport Industrial Area and lower Milliken-Sarco-Tulocay Creeks Area to incorporate dual plumbing to allow for the use of non-potable/recycled water when such water becomes available.

d) Encourage the use of non-potable/recycled water wherever recycled water is available and require the use of recycled water for golf courses where feasible.

Napa County Groundwater Conservation Ordinance

The Napa County Groundwater Conservation Ordinance regulates extraction and use of groundwater in Napa County and prohibits extraction for wasteful or non-beneficial purposes. To obtain a groundwater permit, single-family homes with associated landscaping less than two acres in size are required to install a meter on the well serving the parcel. The meter must be read every six months and readings must be reported to the Napa County Public Works Department. Parcels over 2 acres in size are limited to a maximum of 0.60 AFY or such other amount as may be adopted by the Napa County Board of Supervisors by resolution. Agricultural developments in the groundwater–depleted basins are required to obtain a groundwater permit, unless specifically exempt. Permit conditions for agricultural parcels greater than two acres within the groundwater deficient area require wells have meters installed and limit the user to 0.30 AF per acre per year, calculated as a three-year average. Groundwater wells serving agricultural areas outside the MST area do not require permitting (13.15 Napa County Code).

City of Napa

Goal NR-4: To protect and enhance surface water and ground water quality.

***NR-4.1*:** The City shall support the maintenance and improvement of surface and ground water quality.

City of American Canyon

***Objective 5.3*:** Increase ability to share water supply with Napa and Vallejo during emergencies and extended periods of restriction of the NBA supply.

Policies 5.3.1: Investigate feasibility and cost-effectiveness of increasing storage of raw water in local area.

5.3.2: Investigate benefits and costs of increasing capacity of interconnection with Napa.

***Objective 5.4*:** Establish a water management program to promote water conservation and wastewater reuse.

5.4.4: Investigate potential uses for and costs of supplying reclaimed wastewater.

5.4.5: Require that development projects consider the appropriateness of the channelization of storm water runoff to facilitate its possible capture and re-use for on-site irrigation and other purposes.

Goal 5A: It shall be the goal of American Canyon to provide a high quality water supply to American Canyon water users.

***Objective 5.5*:** Select supplemental raw water supply sources with water quality as a high priority.

Goal 5D: Maintain the quality of surface and subsurface water resources within the City of American Canyon and its Planning Area.

APPENDIX 3.4B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to groundwater.

POTENTIAL IMPACTS AND SIGNIFICANCE – GROUNDWATER

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**SVCSD**	**SCWA**	**Napa SD**	**Petaluma**	**American Canyon**
Impact 3.4.1: Groundwater Quality							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NINI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.4.2: High Groundwater Conditions							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.4.3: Hydrostatic Pressure							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/NI	NI/NI	NI/NI	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.4.4: Groundwater Recharge							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.5
Water Quality

3.5A Regulatory Framework
3.5B Impact Summary by Service Area

APPENDIX 3.5A
Regulatory Framework

3.5.2 Regulatory Framework

Federal

Clean Water Act

Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The CWA established the basic structure for regulating discharges of pollutants into waters of the United States (waters of the U.S.), and gave the U.S. Environmental Protection Agency (USEPA) the authority to implement pollution control programs such as setting wastewater standards for industrial and municipal dischargers. The CWA also continued requirements to set water quality standards for all known contaminants in surface waters. The CWA made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions (USEPA 2017a). This federal law and its accompanying regulations are applicable to wastewater discharges to waterways, however separate State laws and requirements, as described below, govern the delivery and application of recycled water in California.

Section 303(d) of the CWA requires states, territories, and authorized tribes to develop a list of water quality-impaired segments of waterways. The 303(d) list includes water bodies that do not meet water quality standards for the specified beneficial uses of that waterway, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water bodies on their 303(d) lists and implement a process, called Total Maximum Daily Loads (TMDLs), to meet water quality standards (USEPA 2017b).

The TMDL process is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the maximum allowable loadings of a pollutant that can be assimilated by a water body while still meeting applicable water quality standards. States are required to include approved TMDLs and associated implementation measures in State water quality management plans. Within California, TMDLs implementation is through regional Basin Plans.

State – Pertaining to Effluent Discharges

Porter-Cologne Water Quality Act

The California Porter-Cologne Water Quality Act (Porter-Cologne Act also known as the Water Code, Section 7) was enacted in 1969 and established the State Water Resources Control Board (State Water Board).

The Porter-Cologne Act also contains rules and requirements consistent with the federal CWA for discharges to waterways. It defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. However, unlike the CWA, the Porter-Cologne Act applies to both surface and groundwater. The Porter-Cologne Act requires that each of nine semi-autonomous

RWQCBs establish water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per Federal CWA regulations. Therefore, the regional plans provide the regulatory framework for meeting State and Federal requirements for water quality control. Changes in water quality are only allowed if the change is consistent with the most restrictive beneficial use designation identified by the State, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans.

State – Pertaining to Recycled Water Delivery

State of California Constitution Article X, Section 2

Article X, Section 2 prohibits the waste or unreasonable use of water, regulates the method of use and method of diversion of water and requires all water users to conserve and reuse available water supplies to the maximum extent possible.

California Water Code

The Porter Cologne Act Division 7 Article 7 Section 13550 of the California Water Code states that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscape areas, and industrial and irrigation uses is a waste and unreasonable use of water if recycled water is available that meets specified conditions of its use. State Water Board supports the use of recycled water and has included increased water recycling in its strategic plan. In 1991, the California Water Recycling Act (California Water Code 13577) originally set recycling goals of 700,000 AFY of water by year 2000 and 1 million of water AFY by 2010. By 2009, a survey of water recycling indicated that the total for the state had only reached 670,000 AFY. A revised goal of 1 million AFY was then set for 2020.

The state recycling criteria are defined in California Water Code Section 13520 as the levels of constituents of recycled water, and means for assurance of reliability under the design concept which will result in recycled water safe from the standpoint of public health, for the uses to be made. California Water Code Section 13521 authorizes the California Department of Public Health to establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health. As of July 1, 2014, the administration of the California Drinking Water Program (DWP) was transferred from the Department of Public Health to the State Water Resources Control Board (SWRCB). This transfer of responsibility aligned the state's drinking water and water quality programs in an integrated organizational structure to best position the state to both effectively protect water quality and the public health as it relates to water quality, while meeting current needs and future demands on water supplies.[1]

Within the SWRCB, the Division of Drinking Water (DDW) has primary responsibility for regulating the application and use of recycled water. Planning and implementing water recycling projects entails numerous interactions with this regulatory agency prior to project approval.

Title 17 California Code of Regulations

Recycled water-related regulations are generally found in Titles 17 and 22. Title 17 states "that the water supplier will protect the public water supply from contamination by implementation of cross connection control program." Sections 7601-7605 describe the measures required to prevent contamination of potable water from recycled water.

[1] Bay Area Water Supply and Conservation Agency, *Water Recycling and Potable Reuse White Paper*, July 2017.

Title 22 California Code of Regulations

As stated above, DDW is now responsible for developing criteria for regulating the use of recycled water in California. Article 4 in Title 22 of the California Code of Regulations sets water quality standards and treatment reliability criteria for recycled water. Title 22 establishes regulatory requirements for use of recycled water to protect its beneficial uses for land applications and/or industrial uses.

According to Title 22 of the California Code of Regulations (CCR), recycled water can be used for irrigation, wetlands, restricted and non-restricted recreational impoundments, landscape impoundments, industrial or commercial cooling or air conditioning, toilet flushing and industrial and construction applications (22 CCR).

Title 22 establishes quality and treatment standards for the beneficial use of recycled water. The recycled water quality standards (organized with the highest level of treatment first and the lowest level of treatment last) are as follows:

1. ***Disinfected tertiary recycled water*:** A filtered and subsequently disinfected wastewater that meets the following criteria:

    a. The filtered wastewater has been disinfected by either:

        i. A chlorine disinfection process following filtration that provides a contact time (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or

        ii. A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

    b. The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed [a most probable number (MPN)] of 2.2 per 100 milliliters [mL] utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 mL.

2. ***Disinfected secondary-2.2 recycled water*:** Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 2.2 per 100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in any 30-day period.

3. ***Disinfected secondary-23 recycled water*:** Recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed an MPN of 23 per 100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 mL in more than one sample in any 30-day period.

4. ***Undisinfected secondary recycled water (also known as oxidized wastewater)*:** Wastewater in which the organic matter has been stabilized, is non-putrescible, and contains oxygen.

Table 3.5-1 summarizes the water quality standards set by Title 22 for agricultural and urban uses of recycled water. The table is organized with the highest level of treatment at the top and the lowest level of treatment at the bottom.

TABLE 3.5-1: TITLE 22 STANDARDS AND USES OF RECYCLED WATER

Treatment Standard	Use
Disinfected tertiary recycled water	a. Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop b. Parks and playgrounds c. School yards d. Residential landscaping e. Unrestricted access golf courses f. Any other irrigation not prohibited by other sections of the CCR
Disinfected secondary-2.2 recycled water	a. Food crops where the edible portion is produced above ground and not contacted by the recycled water
Disinfected secondary-23 recycled water	a. Cemeteries b. Freeway landscaping c. Restricted access golf courses d. Ornamental nursery stock and sod farms where access by the general public is not restricted e. Pasture for animals producing milk for human consumption f. Any non-edible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground, or school yard
Undisinfected secondary recycled water	a. Orchards where the recycled water does not come into contact with the edible portion of the crop, b. Vineyards where the recycled water does not come into contact with the edible portion of the crop c. Non-food-bearing trees d. Fodder and fiber crops and pasture for animals not producing milk for human consumption e. Seed crops not eaten by humans f. Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans g. Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public

SOURCE: 22 CCR

As discussed in Section 2.0, Project Description, all recycled water served by the project will be treated to disinfected tertiary recycled water standards. Treatment to tertiary standards can be readily achieved using a variety of filtration and disinfection methods that are both reliable and relatively common to the wastewater treatment industry. Title 22 also sets use requirements for the separation of areas irrigated with recycled water from domestic groundwater supply wells. The domestic well guidelines are as follows:

1. 50 feet for disinfected tertiary recycled water unless additional conditions are met;
2. 100 feet for impoundments of disinfected tertiary recycled water;
3. 100 feet for irrigation or impoundments of disinfected secondary-2.2 or disinfected secondary-23 recycled water; and
4. 150 feet for non-disinfected secondary recycled water (22 CCR).

Additional recycled water use requirements include the following:

1. "Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency."

2. "Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities."

3. "Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff."

4. "No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard."

5. "All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public…that include the following wording: 'RECYCLED WATER - DO NOT DRINK'."

6. "Except as allowed under section 7604 of Title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water."

7. "The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access." (22 CCR)

8. "No recycled water used for irrigation, or soil that has been irrigated with recycled water, shall come into contact with the edible portion of food crops eaten raw by humans unless the recycled water complies with the treatment requirements of Section 60304 (a)."

State Recycled Water Policy

California Water Code Section 13140 authorizes the SWRCB to adopt state policy for water quality control. The SWRCB approved a Recycled Water Policy in February 2009, which was revised in January 2013. The purpose of the Policy is to focus on increasing the use of recycled water from municipal wastewater sources that meets the definition in Water Code Section 13050(n), in a manner that implements state and federal water quality laws. The Policy also describes criteria that are intended to streamline the permitting of recycled water projects.

When used in compliance with this Policy, Title 22 and all applicable state and federal water quality laws, the SWRCB finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses. The SWRCB expects to develop additional policies to encourage the use of stormwater, encourage water conservation, encourage the conjunctive use of surface and groundwater, and improve the use of local water supplies.

The Policy declares the State Water Board mission to "preserve, enhance and restore the quality of California's water resources to the benefit of present and future generations." To achieve that mission, the State Water Board supports and encourage every region in California to develop a salt/nutrient management plan that is sustainable on a long-term basis and that provides California with clean, abundant water. These plans shall be consistent with the Department of Water Resources' (DWR) Bulletin 160, as appropriate, and shall be locally developed, locally controlled and recognize the variability of California's water supplies and the diversity of its waterways. Sonoma Valley prepared a Salt Nutrient Management Plan in 2013. The State Water Board strongly encourages local and regional water agencies to move toward clean, abundant, local water for California by emphasizing appropriate water recycling, water conservation, and maintenance of supply infrastructure and the use of stormwater (including dry-weather urban runoff) in these plans.

State Water Resources Control Board Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW)

The SWRCB adopted Order WQ 2016-0068-DDW on June 7, 2016, authorizing uses of recycled water statewide. This general order was established in recognition of the need for streamlined permitting consistent with the Recycled Water Policy, and is intended to provide consistent regulation of non-potable uses of recycled water. To provide such consistency, the State Water Board intends that regulatory coverage under an existing Regional Water Board general order or conditional waiver for non-potable uses of recycled water (landscape irrigation, golf course irrigation, dust control, street sweeping) will be terminated by the applicable Regional Water Board by 2019. Enrollees covered by a Regional Water Board general order or conditional waiver for non-potable uses of recycled water may continue discharging under that authority until authorized by the applicable Regional Water Board. The order authorizes beneficial, non-potable recycled water uses consistent with the Uniform Statewide Recycling Criteria and any additional requirements specified by the SWRCB, and is applicable to recycled water projects where recycled water is used or transported for non-potable uses (such as irrigation, construction, fire suppression).The entity covered by this permit is required to ensure recycled water meets specific quality standards and shall be responsible for the operation and maintenance of major transport facilities and associated appurtenances.

This order does not regulate the treatment of wastewater, and does not relieve producers or distributors from the obligation to comply with applicable Waste Discharge Requirements for discharges from wastewater treatment plants, other than the recycled water uses described in the order. Under this order recycled water use shall not cause unacceptable groundwater and/or surface water degradation, shall not create nuisance conditions, and shall only be used consistent with the Uniform Statewide Recycling Criteria.

Producers, distributors, and users of recycled water can apply for coverage under this general permit. If an existing or proposed use of recycled water seeking coverage under this general order could result in water quality degradation, the Regional Water Boards Executive Officer shall notify the applicant/discharger of the need to either revise the proposed/existing project, or apply for or continue coverage under a site-specific order of the Regional Water Board.

Among other requirements, recycled water used for irrigation purposes pursuant to this order must be applied at agronomic rates to reduce incidental runoff.

Regional

Basin Plan

The California Water Code (Section 13240) requires the preparation and adoption of water quality control plans (Basin Plans), and the Federal CWA (Section 303) supports this requirement. According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and an implementation program needed for achieving the objectives. State law also requires that Basin Plans conform to the policies set forth in the Water Code, beginning with Section 13000, and any State policy for water quality control. The Basin Plans are regulatory references for meeting the state and federal requirements for water quality control (40 Code Federal Regulations 131.20). One significant difference between the State and Federal programs is that California's basin plans also establish standards for groundwater in addition to surface water (SFRWQCB, 2017).

Basin Plans are adopted and amended by nine regional water boards under a structured process involving full public participation and state environmental review. Basin Plans and amendments thereto do not become effective until approved by the State Water Board. Regulatory provisions must be approved by the Office of Administrative Law. Adoption or revision of surface water standards is subject to the approval of the USEPA.

The State Water Board and the regional water boards maintain each Basin Plan in an updated and readily available edition that reflects the current water quality control programs.

RWQCB Resolution 94-086

The San Francisco Bay Basin Plan prohibits the discharge of wastewater under certain conditions, at any point where the wastewater does not receive a minimal initial dilution of at least 10:1 and into any nontidal water or dead-end slough or similar confined water area. The Basin Plan provides an exception to the prohibition under the following conditions:

1. where an equivalent level of environmental protection can be achieved, or
2. the discharge is approved as part of a reclamation project, or
3. where it can be demonstrated that the net environmental benefits will be derived as a result of the discharge.

The RWQCB Resolution 94-06 examines the three exceptions and states that demonstrating the net environmental benefit associated with creating, restoring, and/or enhancing wetlands will apply as an exception to the prohibition of the discharge. The proposed project would include initial use of 2,000 to 3,000 AF of recycled water from the SVCSD WWTP for wetland habitat restoration at the Napa Salt Marsh. SVCSD would be required to obtain an exception to discharge prohibition from the San Francisco Bay RWQCB.

NPDES Phase II Small MS4 General Permit

In accordance with the Clean Water Act, the EPA promulgated rules establishing the National Pollutant Discharge Elimination System (NPDES) stormwater program. As part of the Municipal Stormwater Program under the NPDES, operators must implement stormwater management programs to control polluted discharges. The Phase II Rule covered all small municipal separate storm sewer systems (MS4s) not covered under Phase I which include Marin County and its Cities, Napa County and its Cities, Sonoma County and the Cities of Petaluma, Sonoma, and American Canyon. These co-permitees in the Phase II Small Municipal Separate Storm Sewer System (MS4) NPDES permit (Water Quality Order No. 2013-0001-DWQ, NPDES General Permit No. CAS000004) issued by the San Francisco Bay Regional Water Quality Control Board. The permit contains a comprehensive plan to reduce the discharge of pollutants to the "maximum extent practicable" and mandated that participating municipalities implement an approved stormwater management plan. The program incorporates BMPs that include construction controls (such as a model grading ordinance), legal and regulatory approaches (such as stormwater ordinances), public education and industrial outreach (to encourage the reduction of pollutants at various sources), inspection activities, wet-weather monitoring, and special studies.

Provision E.12 of the Phase II Small MS4 permit establishes post-construction stormwater management requirements. The goal of Provision E.12 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques. Permitees are required to use specific numeric sizing criteria to evapotranspire, infiltrate, harvest/use, or biotreat stormwater.

Local

Cities and counties within the study area contain goals and policies within their general plans that could apply to water quality and the proposed project. In general, water quality issues related to stormwater runoff pollutants are addressed primarily by the Phase II NPDES program for MS4s which is discussed above. At the local level, water quality regulations defer to the state regulations that fall under the jurisdiction of the State Board, CDPH, and the California Code of Regulations, specifically Title 17 and Title 22.

APPENDIX 3.5B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to water quality.

POTENTIAL IMPACTS AND SIGNIFICANCE – WATER QUALITY

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	SVCSD	SCWA	Napa SD	Petaluma	American Canyon
Impact 3.5.1: Short Term Construction							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI//NI	NI/NI	NI/NI	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	NI
Impact 3.5.2: Incidental Runoff							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	NI
Impact 3.5.3: Public Health							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.5.4: Agricultural Uses							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.5.5: Groundwater Quality							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.5.6: Pipeline Rupture							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/NI	NI/NI	NI/NI	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.6
Biological Resources

3.6A. Setting and Regulatory Framework

3.6B. Sensitive Species with Potential to Occur in the NBWRP Phase 2 Area

3.6C. Impact Summary by Service Area

APPENDIX 3.6A
Setting and Regulatory Framework

3.6.1 Affected Environment

Vegetation Communities

Annual Grassland

Aside from landscaped urban areas and disturbed ruderal areas, annual grassland is a most common vegetation community in Novato, Sonoma, Petaluma, American Canyon, San Rafael and Napa. This community occurs along roadsides and off-road pipeline routes throughout the project area, varying from disturbed ruderal vegetation to relatively intact grassland communities. California annual grassland is found in the surrounding hillsides along with oak woodlands and is often found in areas that have been grazed or converted to agriculture.

Annual grasslands consist mainly of sparse to dense coverage of non-native grasses, often associated with other annual and perennial herbs. These grasslands typically occur on deeper soils in the gaps between oak and riparian forests, and also can form the understory of several other plant communities. Non-native grassland species are commonly found in moderately disturbed areas, such as grazed grasslands. Along roadsides and beneath the many valley oak and coast live oak trees, annual grasslands provide a nearly continuous ground coverage. These areas have generally low habitat structure and diversity as a result of historic management and disturbances. Most of the upland habitat within the north bay region has been converted to agriculture, including oat hay, pastureland, and more recently, vineyards. These areas support a mixture of native and nonnative vegetation in the form of annual grasses, herbs, and wildflowers, along with oat hay and grapevines. Ruderal species, typically aggressively-growing, nonnative plants, are found in areas disturbed by vehicle traffic or other human intrusion.

Annual grassland in the project area is found in all service areas, along road shoulders, in open spaces, and adjacent to structures and bike paths. It includes mostly non-native species, mainly annual grasses and few herbaceous forbs. Common species include wild oat (*Avena barbata*), annual ryegrass (*Lolium multiflorum*), ripgut brome (*Bromus hordaceus*), and foxtail barley (*Hordeum murinum* var. *leporinum*). Herbaceous forbs include California burclover (*Medicago polymorpha*), ox-tongue daisy (*Picris echioides*), cutleaf geranium (*Geranium dissectum*), star-thistles (*Centaurea* spp.), wild radish (*Raphanus sativa*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), filaree (*Erodium cicutarium*) and uncommonly, California poppy (*Eschscholzia californica*), California buttercup (*Ranunculus californica*), and dove lupine (*Lupinus bicolor*).

Many wildlife species use both native and non-native grasslands for refugia and nesting and foraging materials; wooded habitats adjacent to grasslands in the project area provide both shelter and breeding and nesting habitat. Amphibians in this community include western toad (*Anaxyrus boreas*), Sierran treefrog (*Pseudacris sierra*), and California slender salamander (*Batrachoseps attenuatus*). Common reptiles in north bay grassland habitats include western fence lizard (*Sceloporus occidentals*), western skink (*Eumeces skiltonianus*), gopher snake (*Pituophis melanoleucus*), and western rattlesnake (*Crotalus viridus*), which are often found in association with woody debris or rocks. Blacktail jackrabbit (*Lepus californicus*), Audubon's cottontail (*Sylvilagus audubonii*), and Botta's pocket gopher (*Thomomys bottae*) are common. Small rodents

provide forage for area raptors (birds of prey) including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), red-shouldered hawk (*Buteo lineatus*), and northern harrier (*Circus cyaneus*). Birds that nest and forage locally in grasslands include western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), and song sparrow (*Melospiza melodia*). Principal game species in this habitat type include blacktail deer (*Odocoileus hemionus*), California quail (*Callipepla californica*), and mourning dove (*Zenaida macroura*).

Oak Woodland

Oak woodlands typically occur on higher slopes and ridgetops where soils are well-drained. Throughout the project vicinity, this habitat community is present in areas that have not been cleared for cattle grazing or residential development. Oaks provide food, cover, and nesting sites for many wildlife species. Due to historic grazing and management activities, oak woodlands support a savannah-like woodland structure, with clusters of a few scattered mature oaks separated from each other by annual grasslands. Valley oak (*Quercus lobata*) and coast live oak (*Quercus agrifolia*) are the dominant canopy trees along rural project area roads. Other trees that are regionally common include California buckeye (*Aesculus californica*) and California black walnut (*Juglans californica*).

Coast live oak forests support an abundance of birds, reptiles and amphibian species. Coast live oak and valley oak woodlands in the project area support many of the same species as described above in the annual grasslands habitat, but also many that occur in the riparian woodland habitat described below. Coast live oak woodlands are present in SCVSD and Napa SD recycled water service areas upslope from the valley floor, and individual oaks are found along Napa Road, at the Soscol Water Recycling Facility (WRF), and in greenways within Petaluma. While oak woodlands occur on Deer Island adjacent to the tidal marsh, pipelines would be installed within constructed levees crossing seasonal wetlands and tidal marsh that do not support this vegetation community.

Riparian Woodland and Scrub

Riparian woodland and scrub communities are present along project area streams and drainages in the SCVSD, Petaluma, and Napa SD areas. In the Novato SD project area, riparian vegetation is highly disturbed by Himalayan blackberry and grassland species.

Riparian habitat varies throughout the project area; vegetation along drainage corridors forms sparse to dense woodlands and scrub, and in some disturbed areas riparian habitat is displaced by nonnative annual grassland. Dominant species vary and include valley oak, coast live oak, and Oregon ash (*Fraxinus latifolia*) often accompanied by arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), California bay (*Umbellularia californica*), walnut, big-leaf maple (*Acer macrophyllum*), and black cottonwood (*Populus balsamifera*). Below the tree canopy, a relatively dense understory of shrubs and sapling trees comprised of California and Himalayan blackberry (*Rubus ursinus* and *R. discolor*), mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), and various rushes (*Juncus* spp.). Riparian scrub in the project area is characterized by dense thickets of arroyo and red willows. This community supports very little herbaceous understory due to low light conditions at the soil surface, which suppresses seed germination. Riparian scrub may succeed to any of several riparian woodland or forest types in the absence of flooding disturbance.

Riparian woodland (including mixed riparian and willow riparian scrub) habitat provides food, water, migration and dispersal corridors, breeding sites, and thermal cover for many resident and migratory wildlife species. Wooded stream edges serve as nesting sites and escape habitat for many species. Foliage, bark, and ground substrates provide a variety of shelter and foraging areas. Birds that forage for insects in riparian areas include Bewick's wren (*Thryomanes bewickii*), black phoebe (*Sayornis nigricans*), and black-headed grosbeak (*Pheuticus melanocephalus*). Bark-insect foraging birds also occur in this habitat and include acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttalli*), and white-breasted nuthatch (*Sitta canadensis*). Other bird species found in the riparian corridor include dark-eyed junco (*Junco hyemalis*),

bushtit (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), chestnut-backed chickadee (*Poecile rufescens*), and brown creeper (*Certhia americana*). Riparian woodland areas also support fish-eating birds such as the belted kingfisher (*Ceryle alcyon*).

Riparian woodlands provide habitat for reptiles and amphibians including the western toad, California newt (*Taricha torosa*), Sierran treefrog, and Pacific slender salamander. Mammals such as the western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), western gray squirrel (*Sciurus griseus*), Virginia opossum (*Didelphis marsupialis*), and raccoon (*Procyon lotor*) utilize these habits for nesting and foraging. Blacktail deer and striped skunk (*Mephitis mephitis*) are also common. Small rodents attract raptors such as red-shouldered hawk (*Buteo lineatus*) and red-tailed hawk.

Wetlands

Freshwater marshes

Freshwater marshes occur at many project area locations, often in association with willow scrub habitat. These include areas with slow- moving and shallow water or perennially saturated soils, such as low-flow stream channels or where gravel bars support a sparse cover of annual and perennial emergent vegetation species. Marshes may also occur in flood control channels and irrigation ditches, alongside roadways and bike trails, and in detention ponds throughout the project area. Freshwater marsh or freshwater emergent wetland habitats are generally dominated by perennial emergent monocots and other hydrophytic vegetation; common species include cattail (*Typha latifolia* and *T. agrifolia*), bulrush (*Scirpus* sp.), spikerush (*Eleocharis* spp.), lance-leaved water plantain (*Alisma lanceolatum*), and Baltic rush (*Juncus balticus*). Freshwater marshes are among the most productive wildlife habitats. They provide food, water, and shelter for many species of amphibians, reptiles, birds, and mammals. Freshwater marsh and freshwater seep habitats are often contiguous with riparian habitat and support many of the same wildlife species previously described.

Freshwater marshes are found in the SCVSD, Novato SD, Petaluma, and Napa SD recycled water service areas at project area stream crossings, in irrigation canals, along roadside ditches, and at other topographical low areas. Freshwater wetlands are present along the Novato alignment, upslope from brackish and saltwater marsh.

Seasonal Wetlands

Seasonal wetlands occur in topographical low-points where water is allowed to saturate or inundate for long periods of time and hydrophytic vegetation is able to establish seasonally. Seasonal wetlands are typically annual in nature and are colonized by opportunistic vegetation. Evidence of these features may not be visible after late spring or early summer and features may not persist from year to year, depending on climatic conditions. Pickleweed (*Salicornia* spp.) and brass buttons (*Cotula coronopifolia*) are common in saline seasonal wetlands; pickleweed and alkali bulrush (*Scirpus maritimus*) are common in brackish seasonal wetlands; and rushes and sedges are common in freshwater seasonal wetlands. Seasonal wetlands support a variety of invertebrates and amphibians that in turn provide food for other wildlife species. Seasonal wetlands are found near the alignment in Novato, at the Soscol WRF, and may occur at crossing sites along Napa Road or in Petaluma and American Canyon.

Rivers, Creeks and Ponds

The project area encompasses portions of the Petaluma River watershed, the Sonoma Creek watershed, and the Napa River watershed, involving major and minor creeks, sloughs and rivers (see **Figures 3.3-2** through **3.3-5** in **Appendix A**). Potential pipeline crossings would occur at 36 streams, including Lynch Creek, North Slough and Arroyo Seco, which are within critical habitat for Central Coast steelhead (*Oncorhynchus mykiss*), a federally endangered species. Varying amounts of overhanging riparian vegetation influence stream temperatures and provide a steady source of invertebrate forage for fish and other wildlife. With a diversity of

pool, riffle, and run habitats, some larger, high quality stream reaches may support California freshwater shrimp (*Syncaris pacifica*).

Resident fish typical of streams in the region include Pacific lamprey (*Lampetra tridentata*), prickly sculpin (*Cottus asper*), Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), and California roach (*Hesperoleucus symmetricus*). The identified roach-sucker-pikeminnow fish association is typical of lower stream reaches that are characterized by relatively warm, low-gradient conditions. This presents the expectation that steelhead rearing habitat may be comparatively infrequent in lower creek reaches, but higher quality habitat is present in fast-moving upstream areas and relatively cooler tributaries.

Vineyard and agricultural ponds throughout Sonoma and Napa valleys in the general project vicinity number in the tens to hundreds. In the Novato SD recycled water service area, ponds occur north of Highway 37 near the Deer Island Preserve. Wastewater treatment plant ponds in the project area offer varying levels of aquatic habitat. Common wildlife species typically found in this habitat include Sierran treefrog, western toad, garter snake, and bird species adapted to riparian environments such as snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), and black phoebe.

Salt and Brackish Marsh

While levees and flood-control features prevent tidal influence in many areas, expanses of high-quality tidal marshes persist in the North Bay. Salt and brackish marshes occur near Hamilton Field and Bel Marin Keys, as well as at Sears Point and the Petaluma River mouth on the bay side of Highway 37, all in the Novato SD recycled water service area.

Salt and brackish water marshes are found along the margins of San Pablo Bay. Salt-tolerant vegetation thrives in these marshes; salinity can vary annually in relation to rainfall patterns and stream flow, and successful vegetation must also tolerate water level fluctuations. Common vegetative species include pickleweed, alkali bulrush, California cordgrass (*Spartina foliosa*), California tule (*Scirpus californicus*), fleshy jaumea (*Jaumea carnosa*), Baltic rush, saltmarsh dodder (*Cuscuta salina*), frankenia (*Frankenia salina*), fat hen (*Atriplex triangularis*), arrowgrass (*Triglochin maritima*), curly dock (*Rumex crispus*), brass buttons, gumplant (*Grindelia stricta* var. *angustifolia*), yarrow (*Achillea borealis*), asters (*Aster* spp.), and sedges (*Carex* spp.). Nonnative invasive species include pepperweed (*Lepidium latifolium*), smooth cordgrass (*Spartina alternifolia*), and fennel (*Foeniculum vulgare*).

Tidal marshes support a variety of special-status species, including salt marsh harvest mouse (*Reithrodontomy raviventris*), Ridgway's rail (*Rallus obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), salt marsh shrews (*Sorex* spp.), and bird's beak (*Cordylanthus* spp.). These species are discussed in greater detail.

Urban

The majority of pipeline alignments will be installed within existing roadways, sidewalks and urban corridors to avoid or minimize potential environmental impacts. Urban and suburban neighborhoods dominate the Petaluma Downtown and Petaluma Agricultural service areas, the American Canyon service area, the MMWD service area near San Quentin State Prison, and the SCVSD Napa Road area.

Sensitive Species and Habitats

Federal and State laws regulate wetlands, surface water features, and vulnerable plant and animal species and their habitats. The jurisdiction, resource management approaches, and enforcement activities of federal and State regulatory agencies vary depending on the specific vulnerable resource. Wetlands and endangered or threatened plants and animals receive the highest protection. Other non-listed plant and animal species may still be vulnerable enough to be recognized as special-status species.

Listed Species – Plants

Sonoma Sunshine (*Blennosperma bakeri*). Sonoma sunshine is a federal and state-listed endangered species. This California endemic is restricted to vernal pools, shallow depressions, and intermittent swales within mesic valley and foothill grasslands on the Santa Rosa Plain and Sonoma Valley in Sonoma County. Its blooming period is March through May. This species is threatened by urbanization and conversion of habitat to agricultural lands, as well as possibly threatened by non-native plants, foot traffic and road maintenance. Sonoma sunshine is present along Bonneau Road approximately one mile south of the Napa Road alignment, and other occurrences are approximately 0.5 miles northwest (CDFW, 2017). Populations are not known from Napa Road and no vernal pool habitat occurs adjacent to Napa Road. The remaining NBWRP Phase 2 sites are not within the range of this species.

Listed Species – Fish and Wildlife

California Freshwater Shrimp (*Syncaris pacifica*). The California freshwater shrimp is a federal- and state-listed endangered species. This species is endemic to 17 coastal streams in Marin, Sonoma, and Napa counties north of San Francisco Bay. Streams that support California freshwater shrimp present a broad range of stream and water temperature conditions that are characteristic of coastal streams. They have been found in low elevation (less than 380 feet) and low gradient (generally less than one percent) perennial coastal streams.

California freshwater shrimp are generally found in stream reaches where banks are structurally diverse with undercut banks, exposed roots, overhanging woody debris, or overhanging vegetation. Optimal habitat conditions for the shrimp occur under stream conditions with 12 to 35 inches in depth with exposed live roots (e.g., alder and willow trees) along undercut banks (greater than 6 inches) with overhanging stream vegetation and vines. Such areas provide cover from swift currents as well as some protection from high sediment concentrations associated with high stream flows. Adults reach sexual maturity by the end of their second summer of growth. Thereafter, they breed once a year in the fall. Females produce about 50 to 120 eggs, which remain attached to their mother throughout the winter.

Though endemic to Marin, Sonoma and Napa County streams, within the recycled water service area stream crossings, only Sonoma Creek is known to support California freshwater shrimp. They are presumed present in Arroyo Seco, which will be crossed by the planned alignment. The remaining NBWRP Phase 2 stream crossings do not have potential to impact this species.

Winter-run, Fall-run, and Spring-run Chinook Salmon (*Oncorhynchus tshawytscha*). The population of Chinook salmon in San Francisco Bay is comprised of four races: fall-run, late fall-run, spring-run, and winter-run. These races are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending three to five years at sea before returning to freshwater to spawn. Chinook salmon generally require cool, clean, and well-oxygenated water in streams and rivers that contain adequately sized spawning gravels, instream cover, and riparian shading. Migration barriers in the form of dams, grade control structures, culverts, or water diversion structures significantly limit Chinook salmon access to historical habitat throughout their range. These fish pass through San Francisco Bay waters, including San Pablo Bay, to reach their upstream spawning grounds. In addition, juvenile salmon migrate through the Bay en route to the Pacific Ocean.

The Central Valley (Sacramento) winter-run Chinook salmon, listed as both State and federally endangered, migrate through San Francisco Bay from December through July with a peak in March. Spawning is confined to the mainstem Sacramento River and occurs from mid-April through August. Juveniles emerge between July and October, and are resident in their natal stream for 5 to 10 months followed by an indeterminate residency period in estuarine habitats.

The State and federal-listed threatened Central Valley spring-run Chinook salmon migrate to the Sacramento River from March to September with a peak spawning period between late August and October. Juvenile

salmon emerge between November and March, and are resident in streams for a period of 3 to 15 months before migrating to downstream habitats.

The Central Valley fall-run and late fall-run Chinook salmon are federal candidates for listing, and California Species of Special Concern. These salmon enter freshwater from June through December and spawn from October through December, with a peak in November.

Central California Coast and Central Valley Steelhead (*Oncorhynchus mykiss*). Central Valley and Central Coast steelhead, like Chinook salmon, are anadromous. Adult steelhead spawn in freshwater and the juveniles migrate to the Pacific Ocean where they reside for a period of years before returning to the river system to spawn. Adult steelhead migrate upstream during the fall and winter (September through approximately February) with Central Valley steelhead migration into the upper Sacramento River typically occurring during the fall and adults migrating into lower tributaries typically during the late fall and winter. Steelhead spawn in areas characterized by clean spawning gravels, cold-water temperatures, and moderately high velocity. Spawning typically occurs during the winter and spring (December – April) with the majority of spawning activity occurring during January and March. Unlike Chinook salmon that die after spawning, adult steelhead may migrate downstream after spawning and return to spawn in subsequent years. Juvenile steelhead rear within the stream system for one or more years before migrating to the ocean. Downstream migration of juvenile steelhead typically occurs during the late winter and early spring (January – May). The seasonal timing of downstream migration of Central Valley and Central Coast steelhead may vary in response to a variety of environmental and physiological factors including changes in water temperature, changes in stream flow, and increased turbidity resulting from stormwater runoff. The juvenile steelhead rear within the coastal marine waters for approximately 2 to 3 years before returning to their natal stream as spawning adults.

California Red-legged Frog (*Rana draytonii*). The California red-legged frog is a federally-listed threatened species and a California species of special concern. This ranid species is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable habitat for this species in the non-breeding season. Adult frogs seek waters with dense shoreline vegetation, such as cattails, that provide good cover, but may be found in unvegetated waters as well.

Red-legged frogs breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters. Tadpoles grow to three inches before metamorphosing. Red-legged frogs are active year-round along the coast but inland populations may aestivate from late summer to early winter. Adults consume insects such as beetles, caterpillars and isopods, while tadpoles forage on algae and detritus.

The California red-legged frog is present in roadside drainages along Lakeville Highway in south Petaluma, in upslope ponds east of Petaluma, agricultural ponds in south Sonoma, and ponds and drainages east of American Canyon.

Swainson's Hawk (*Buteo swansonii*). Swainson's hawk is a state-listed threatened species. These medium-sized opportunistic predators feed on rodents, rabbits, bats, large arthropods, amphibians, reptiles, birds, and, rarely, fish. This species arrives in California in late February and departs for wintering grounds in early September. Eggs are typically laid in April and early May. Swainson's hawks reside in a wide variety of open habitats, including prairies, grasslands, and intensively farmed areas. Nests are usually constructed in riparian corridors adjacent to agricultural fields or pastures. Swainson's hawks were historically distributed throughout the lowlands of California, absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the southern California deserts. The highest density currently is in the Central Valley, between Sacramento and Modesto, and in the northern San Joaquin Valley.

Swainson's hawk is present in the Napa SD recycled water service area. A single nest, recorded in 2005, is located in a riparian oak tree approximately 200 feet from the Soscol storage site. A second pair may have nested nearby (CDFW, 2017). Potential nesting habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Western Snowy Plover (*Charadrius alexandrinus nivosus*). The western snowy plover is a federally-listed threatened species and a state Species of Concern. The western snowy plover is a small, 6-inch migratory shorebird found on sandy marine and estuarine shores and at some inland nesting locations. Small numbers are year-round inhabitants at salt ponds on the San Francisco Bay. The threatened Pacific Coast population is defined as those nesting adjacent to the tidal waters of the Pacific Ocean, known to breed from Washington to Baja California. This species gleans insects and amphipods from the dry sand of upper beaches, but occasionally forages in kelp or in wet sand for young sand crabs. They also feed on brine flies at salt ponds. Western snowy plovers rely on camouflage for cover, crouching motionless when danger is suspected.

For nesting they require friable soil, usually sand or gravel, above the high tide line, preferring to nest on coastal beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries. They are uncommon nesters at dry salt ponds and salt pond levees, but such nesting has become more common in response to human disturbances. Nests are shallow depressions sometimes lined with pebbles, gravel, or fragments of glass. They are frequently located near or under driftwood, rocks, or defoliated bushes. The breeding season is March 1 through September 30, clutches average 3 eggs, and parents share incubation duties. Western snowy plovers are polyandrous and the female often abandons the brood, leaving the male to raise the precocial chicks while she mates again for a second clutch. Chicks usually fledge within 31 days.

Western snowy plovers are predated at all life stages by gulls, ravens, coyotes, and skunks. The encroachment of non-native European beachgrass (*Ammophila arenaria*) has also reduced available nesting habitat. The greatest threats are human disturbance, with the breeding season coinciding with the warmest summer months and peak human recreation at sandy beaches.

Western snowy plover nesting habitat is present at the Hamilton airfield in the Novato SD service area, close to the turnout to transitional wetlands. Potential nesting habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

California Black Rail (*Laterallus jamaicensis*). The California black rail is a state-listed threatened species. The sparrow-sized California black rail is a year-round resident of saline, brackish and freshwater emergent wetlands in the San Francisco Bay Area, the Sacramento-San Joaquin Delta, and a few other locations, including small, isolated populations in southeastern California and western Arizona (CDFW, 2005). This species is found in tidal wetlands dominated by pickleweed, in brackish marshes dominated by pickleweed and bulrush, and in freshwater marshes with bulrush, cattails, and saltgrass (*Distichlis spicata*) as dominant vegetation. Heard but rarely seen, black rail live and breed in the high wetland zone, an area with minimal water-level fluctuation. They pick isopods, arthropods and insects from the mud or from vegetation. Breeding season is from March through June, and the majority in northern California breed in San Pablo Bay. They make deep, loose cup nests at ground level or slightly elevated in pickleweed or other dense vegetation, with an average clutch size of six eggs.

Black rails are predated by raptors, large wading birds, and domestic cats. In areas where transitional vegetation between the high wetland zone and the upland zone is absent, predation can be intense (Evens et. al., 1991). Habitat loss is the greatest threat to this species, and the loss of higher wetlands and transitional wetlands throughout San Francisco Bay is thought to be responsible for eliminating breeding populations in the southern parts of the Bay (CDFW, 2005).

California black rail is present in tidal marshes of the Novato SD recycled water service area, but is not expected in the project vicinity. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Ridgway's Rail (*Rallus obsoletus*). Ridgway's (California clapper) rail is a federal- and state-listed endangered species, federally listed on October 13, 1970 (35 FR 16047). Ridgway's rails can be found year-round in coastal wetlands and brackish areas around San Francisco and Monterey Bays. These medium-sized birds require emergent wetlands and mud flats for survival, preferring salt marshes dominated by California

cordgrass and perennial pickleweed (*Salicornia pacifica*). They can also be found in brackish or freshwater marshes where dense bulrush or cattails grow. Clapper rails will forage in higher marsh vegetation along the mudflat interface and in tidal creeks, feeding on crabs, mussels, clams, snails, insects, spiders, worms, and even mice and dead fish. Clapper rails nest in lower tidal zones where cordgrass grows abundantly and tidal sloughs are nearby, building a nesting platform concealed by a canopy of woven cordgrass, pickleweed, or marsh gumplant (*Grindelia stricta*), or of cattail (*Typha spp.*) or bulrush (*Scirpus spp.*) in fresh and brackish waters.

Adult Ridgway's rails are preyed upon by raptors and mammals, while rats predate on eggs and young. In northern California, populations may fluctuate according to rainfall patterns. Agricultural and urban development, accompanied by the filling and diking of wetlands, has led to the destruction of emergent wetland habitat and particularly cordgrass marshes.

Ridgway's rail is present in tidal marshes of the Novato SD recycled water service area and in the vicinity of the Ellis Creek WRF in Petaluma, but is not expected to be present in the vicinity of the Petaluma or Novato SD NBWRP Phase 2 elements.

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris halicoetes*). The salt marsh harvest mouse is a federal- and state-listed endangered species. The salt marsh harvest mouse is found only in a few northern California locations. There are two subspecies, the northern salt marsh harvest mouse (*R. r. halicoetes*) found in the salt marshes of San Pablo and Suisun Bays, and the southern salt marsh harvest mouse (*R. r. raviventris*) found in salt marshes of San Francisco Bay and a few locations in Corte Madera and Richmond. The Collinsville-Antioch area is the eastern limit of distribution, and movement among marshes is infrequent if it occurs at all. This species is critically dependent on dense cover, preferring pickleweed, and is seldom found in cordgrass or alkali bulrush (*Scirpus maritimus*). The value of pickleweed increases with depth, density and the degree of intermixing with fat hen (*Chenopodium spp.*) and alkali heath (*Frankenia grandifolia*). Transitional upper tide zones with peripheral halophytes are used to escape high tides, and even adjoining grasslands are used during the highest winter tides.

The salt marsh harvest mouse eats grass, leaves, seeds, and stems of plants, including pickleweed and saltgrass. Fresh water is required, but both subspecies can drink brackish or salty water for short periods. They are primarily nocturnal, but some afternoon activity does occur. Breeding takes place between March and November, and produces 1 to 2 liters per year with an average litter size of four. This species does not burrow. The northern subspecies makes a minimal nest of grass and sedge, often built over an old bird nest.

Salt marsh harvest mice are prey for owls, hawks, gulls, weasels, and other mammals. Their greatest threat is habitat reduction and degradation. Historically, tidal marshes and open mudflats surrounding San Pablo Bay neared 80,000 acres. There has been an 82 percent reduction in North Bay wetlands since the 1800s, with most of it diked, drained and claimed for agricultural use. The resulting changes in salinity and vegetation support only small, disconnected salt marsh harvest mouse populations. Small, fragmented habitats that are completely submerged during high tides and lack transitional upper tidal zones likely result in breeding failures and increased predation.

Salt marsh harvest mouse is present in salt marshes of Novato SD recycled water service area and in the vicinity of the Ellis Creek WRF in Petaluma, but is not expected to be present in the vicinity of the Petaluma or Novato SD NBWRP Phase 2 elements.

Non-listed Special-status Species - Plants

Species accounts are provided for non-listed special-status plants that are present or have at least a moderate potential to occur in the recycled water service areas.

Franciscan Onion (*Allium peninsular var. franciscanum*). A California Rank 1B.2 plant, Franciscan onion grows in cismontane woodland, clay, and volcanic (often serpentinite) valley and foothill grasslands at elevations between 170 to 1,000 feet. Populations are recorded along the Petaluma Agricultural pipeline alignments, but this area does not currently provide suitable habitat. A population occurs within 1/4-mile of the SCWA ASR programmatic site in the Valley of the Moon. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Napa False Indigo (*Amorpha hookeri ssp. montana*). A California Rank 1B plant, the Napa False Indigo grows on dry, open or wooded slopes at elevations below 3,000 feet. In the North Bay, the inner coast ranges in the Petaluma, SCVSD, SCWA, Napa SD and American Canyon service areas provide foothills woodlands and valley grasslands that support this species. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Pt. Reyes Bird's Beak (*Cordylanthus maritimus ssp. palustris*). A California Rank 1B plant, Pt. Reyes bird's beak is known from coastal salt marshes in Marin and Sonoma counties. While not expected in the project ROW, this species may occur in salt marshes adjacent to the Petaluma Agricultural pipeline alignments, and suitable habitat is present in the Novato SD service area. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Big-scale balsamroot (*Balsamorhiza macrolepis*). A California Rank 1B.2 plant, the big-scale balsamroot is found in chaparral, cismontane woodland and valley and foothill grasslands between 300 and 5,000 feet in elevation. Populations are found in the hills east of the American Canyon pipeline alignment, but the alignment itself does not provide habitat for this species. A population occurs 0.1-mile from the Sonoma ASR programmatic site. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Narrow-anthered brodiaea (*Brodiaea leptandra*). A California Rank 1B.2 plant, this species is found in volcanic soils in upland forest, chaparral, cismontane woodland, coniferous forest and valley and foothill grassland between 360 and 3,000 feet in elevation. A population is located on Arrowhead Mountain in the SVCSD Napa Road pipeline, and another is north of the SCWA ASR programmatic element in grassland habitat. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Congested-headed hayfield tarplant (*Hemizonia congesta ssp. congesta*). A California Rank 1B.2 plant, the hayfield tarplant is found in coastal scrub and valley and foothill grassland, sometimes along roadsides, between 65 and 1,800 feet in elevation. It has been recorded 0.5 miles south of the Novato SD alignment where suitable habitat is present. Other occurrences in Petaluma and Napa Road are likely no longer present due to disturbance and development. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Saline clover (*Trifolium hydrophilum*). A California Rank 1B.2 plant, this clover is found in marshes and swamps and in moist areas of valley and foothill grassland and in vernal pool complexes between 0 and 1,000 feet in elevation. This species has been observed in grassland east of the American Canyon alignment, and in grassland south of the Napa SD Soscol storage site in Napa, as well as other sites in Sonoma County. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Non-listed Special-status Fish and Wildlife Species

Species accounts are provided for non-listed special-status fish, reptiles, and mammals that are present or have moderate or high potential to occur in the recycled water service area and for non-listed special-status birds that are known to nest in the general project vicinity.

Pacific Lamprey (Lampetra tridentata). Pacific lamprey, a California species of special concern, is an anadromous fish with a widespread distribution in Bay Area streams.

Pacific lampreys enter streams from July to October with spawning occurring in the following spring months, between April and July. Spawning takes place in low gradient sections of streams with gravel and sandy bottoms. Upon spawning, adults die. Following a three-week incubation period, larval lampreys emerge and reside in the stream mud or sand substrate for a period of three to five years before metamorphosing into juveniles. Juveniles migrate downstream in late fall through spring and reside in estuaries before swimming to the ocean. After two to three years in the ocean, Pacific lampreys return to freshwater to spawn.

Pacific lamprey are present year-round in Sonoma Creek, the Napa River and the Petaluma River, and they are presumed present in all tributaries that support steelhead trout.

Western Pond Turtle (*Actinemys marmorata*). The western pond turtle is a California species of special concern. This species occurs from the Pacific Northwest through the Central Valley, southern Coast Ranges, and northern Baja California. Pond turtles inhabit ponds, marshes, streams, and ditches that typically have a rocky or muddy substrate and support emergent vegetation. Threats to the turtle include a large number of natural and introduced predators that prey on eggs, hatchlings, and juveniles while the greatest threat to the western pond turtle is human interference, primarily by habitat destruction.

Turtles are typically alert and secretive, and retreat to the cover of water when disturbed, diving beneath the surface and hiding in vegetation or beneath submerged rocks and debris. Western pond turtles are omnivorous scavengers. This species hibernates during the winter, emerging in March to feed and reproduce. Reproduction generally takes place between May and August followed by the deposition of five to eleven eggs which are buried in nests in sunny areas near the water.

The western pond turtle is known from freshwater drainages and ponds throughout Marin, Sonoma and Napa counties. This species has also been observed in brackish water habitats.

Tri-colored Blackbird (*Agelaius tricolor*). Tricolored blackbirds are a colonial species that nest in dense vegetation in and around freshwater wetlands. When nesting, tricolored blackbirds generally require freshwater wetland areas large enough to support colonies of 50 pairs or more. They prefer freshwater emergent wetlands with tall, dense cattails or tules for nesting, but will also breed in thickets of willow, blackberry, wild rose, or tall herbs. During the nonbreeding season, flocks are highly mobile and forage in grasslands, croplands, and wetlands (Zeiner et al., 1988–1990).

Tricolored blackbirds are locally common throughout the Central Valley and coastal areas south of Sonoma County. Breeding colonies in the North Bay include the Napa Salt Marsh Restoration Area, wetlands east of Napa airport, Sears Point, and Pope Valley. Historic breeding colonies occurred along Copeland Creek near Sonoma State University and along the Sonoma/Marin county line east of Valley Ford. This species has potential to occur in the Novato SD, Napa SD, and SVCSD project vicinities. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Golden Eagle (*Aquila chrysaetos*). The golden eagle is a CDFW fully-protected species. It is a very large bird with a wingspan of approximately seven feet. It is typically dark brown but may shows slight signs of white on the wings and on the tail. Juvenile eagles usually show white patches on the wings and tail but the tail patch may be absent. Golden eagles are found throughout California with a range extending from sea level to approximately 11,500 feet.

Golden eagles feed mostly on rodents and rabbits but will take other mammals, birds, reptiles and some carrion. Golden eagles require open woodland or grassland for foraging and tall trees or steep cliffs for breeding. It can also be found in open, rolling country grasslands or savannahs, farms, chaparral, and at the desert edge.

Golden eagles nest on cliffs or tall trees. Large platform nests are constructed from sticks, twigs, and greenery. Breeding season occurs in late January through August but typically between March through July. Golden eagle are single brooded and typically lay 1 or 2 eggs, but rarely 3. Incubation usually performed by female

alone, but sometimes by male and female for approximately 43-45 days. Young are semi-altricial and downy and the nestling period is approximately 30 days. The female feeds the young food brought to the nest by the male until young are approximately 40 days old and then both parents feed for the remainder of the fledging period, typically 65-75 days. Fledglings practice pouncing while remaining in the nest and can fly for short periods at 63-70 days but typically remain at or close to the nest for another 21 days.

Nests have been observed in the foothills of Sonoma and Napa County in the Napa SD service area (CDFW, 2017); the closest to the project area is located approximately 1.5 miles southeast of a pipeline in American Canyon. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Burrowing Owl (*Athene cunicularia*). The burrowing owl is a California species of special concern. Burrowing owls are year-round California residents of open, dry grassland and desert habitats. They are frequently found in low, open grasslands where large rodent burrows are available for nesting. Breeding takes place from March through August, with a peak in April and May. The young emerge from the burrow at about two weeks of age, and can fly at four weeks. Nesting requires existing burrows (these owls have been reported to make their own burrows, but if these reports are accurate the behavior is rare). Ground squirrel colonies provide a potential source of burrows for this owl. The burrows are often lined with grass, debris, and feathers.

Hunting occurs both day and night. Prey species are primarily insects, but also include small mammals, reptiles, birds, and carrion. Burrowing owls may hunt by hovering, diving from above, or pursuing their prey on the ground. However, they often hunt from a perch, and also use perches to thermoregulate. Although burrowing owls in northern California are thought to migrate, owls within central and southern California are predominantly non-migratory.

Burrowing owl is known from scattered locations throughout Marin, Sonoma and Napa counties, and is often regionally observed perching or foraging This species has the potential to occur in the Novato SD, Napa SD and American Canyon project vicinities

Northern Harrier (*Circus cyaneus*). The northern harrier is a California species of special concern. This species is present throughout the Central Valley and surrounding areas and is a resident in the Bay Area in open grasslands and near wetland areas. Female harriers are a large raptor, typically dark brown throughout and an obvious white patch at the base of its tail. Male harriers are slightly smaller than females and mostly gray or mottled grays and an obvious white patch at the base of its tail.

Harriers breed from April to September with peak breeding activity occurring during June through July. Harriers are ground nesters and nests are a mound of sticks and leaves on moist ground, hidden by shrubby vegetation, tall grasses, and forbs in wetlands, and in wetland/upland borders in tidal marshes, freshwater marshes, and annual grasslands habitats. The nestling period is approximately 53 days and harriers typically brood 2-3 young. All fledglings are brown with the white tail patch until males begin to mature and display sexual dimorphism. Breeding pairs and juveniles may roost annually in late fall and winter. Forage areas consist of open ground and grasslands, where harriers hunt for prey items including small mammals, birds, reptiles and amphibians.

Northern harrier breeding habitat is available throughout Marin, Sonoma and Napa counties, and its conspicuous presence indicates that most breeding locations are unrecorded. Potential habitat for this species may be present near all NBWRP Phase 2 elements.

Salt Marsh Common Yellowthroat (*Geothlypis trichas sinuosa*). This species is a California species of special concern. The saltmarsh common yellowthroat breeds and winters in wet meadows, riparian corridors, fresh and saline water emergent habitats, and occasionally grasslands. Forage items primarily include terrestrial invertebrates, but seeds are taken as well. Salt marsh common yellowthroat is known from scattered locations throughout the North Bay, including Tolay Creek and the mouth of the Petaluma river within the project area in the Novato, SVCSD and Petaluma service areas. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

San Pablo Song Sparrow (*Melospiza melodia samuelis*). This species is a California species of special concern. A year round resident to riparian corridors, fresh and saline emergent wetland, and wet meadow habitats. This species is largely granivorous but takes insects as well. San Pablo song sparrow is known from scattered locations throughout the North Bay, including Sears Point, Peacock Gap, and the Napa Salt Marsh. This species historically occurred at numerous locations throughout the Novato, Petaluma and SCVSD service areas. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Other Nesting Birds. Fish and Game Code Sections 3503 and 3503.5, and the Migratory Bird Treaty Act protect raptors and passerines and their eggs and nests from incidental "take." These protections apply to special-status birds identified in **Appendix 3.6C** and other birds that may occur in the project vicinity in all service areas.

Bat Species. Bats generally inhabit woodlands and forests and roost in buildings, mines, caves, crevices, cliff faces, tunnels, bridges, or beneath tree bark. Bats are nocturnal feeders on insects in flight. Prey includes moths, flies, beetles, and other insects. Most bats require a nearby water source. Two sensitive bat species have potential to occur in the general project vicinity, though pallid bat (*Antrozous pallidus*), a California species of special concern, roosts locally and has high potential to occur. Townsend's big-eared bat (*Corynorhinus townsendii*) also a California species of special concern, has been observed in San Rafael, Novato and Petaluma, but has low potential to occur in the project area because suitable roosting habitat is not present. Additional bat species including greater western mastiff bat (*Eumops perotis californicus*), long-eared myotis (*Myotis evotis*), fringed myotis (*M. thysanodes*), long-legged myotis (*M. volans*), Yuma myotis (*M. yumanensis*) may occur in the project area but are not considered special status species.

Large trees within extensive riparian woodlands and older bridges may provide roosting habitat for common and special-status bats including Townsend's big-eared bat, long-legged myotis, and Yuma myotis, among others. Pallid bats have been roosting under a bridge over Sonoma Creek among other local occurrences (CDFW, 2017). Bat roosts may be present in structures, under bridges or in large oak trees that occur sporadically along major roads in the project vicinity in all service areas.

Suisun Shrew (*Sorex ornatus sinuosus*). Ornate shrews occur in California from the Bay Area south to the northern tip of Baja. One of nine subspecies, the Suisun ornate shrew is known only from islands and tidal marshlands of San Pablo and Suisun Bays, California, where it occurs mostly in brackish-water marshes near sea level. It is the most widely distributed subspecies, reported from dry, chaparral-covered slopes and able to tolerate an absence of drinking water. Their presence is associated with vegetative structure rather than species composition, and they prefer low, dense vegetation. Such habitat provides adequate cover, nesting places, and invertebrates for food. The reproductive period extends from February through October. Breeding occurs in spring by shrews born the previous year; they rarely live more than 16 months.

Within the project area Suisun ornate shrew is known from saltwater or brackish marshes of southern Sonoma and Napa counties, in the Novato and Petaluma service areas, generally in the same habitat as salt marsh harvest mouse and rails. The nearest known population occurs at Sears Point, but would not be affected by the proposed project. Potential habitat for this species does not occur in the vicinity of the other NBWRP Phase 2 elements.

Critical Habitat

The NBWRP Phase 2 facilities are not within critical habitat for Contra Costa goldfields, soft bird's beak, vernal pool fairy shrimp, Chinook salmon, Central Valley steelhead, green sturgeon, California tiger salamander, California red-legged frog, western snowy plover, or northern spotted owl.

Critical habitat for central California coast steelhead was designated by the NMFS in September 2005 and became effective on January 2, 2006. Within the project area, the critical habitat designation for the central California coast steelhead Distinct Population Segment includes streams throughout the Novato SD, SVCSD, Petaluma and Napa SD areas (see **Figures 3.6-1** through **3.6-6** in **Appendix A**) (NMFS, 2005).

3.6.2 Regulatory Framework

Federal

Special-status Species

USFWS administers the Federal Endangered Species Act (FESA), the Migratory Bird Treaty Act (MBTA), and the Bald Eagle Protection Act (BEPA), among other programs. The USFWS also creates the list of threatened or endangered (T&E) species protected under the FESA.

Federal Endangered Species Act (FESA)

The FESA prohibits the "take" of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery. The FESA also requires issuance of an incidental take permit prior to taking any public or private action that could harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of a T&E species. Permit issuance requires preparation and implementation of a habitat conservation plan providing specific measures to offset impacts to these species.

Critical Habitat

The USFWS designates critical habitat for federal T&E species listed under the FESA. Critical habitat areas are occupied by the species and are located within a specific geographic region determined to be critical for survival. A discussion of critical habitat occurring in Marin, Sonoma, and Napa counties is included above following Special-status Species.

Federal Essential Fish Habitat

Although the concept of EFH is similar to that of critical habitat under the FESA, measures recommended to protect EFH by NMFS are advisory, not proscriptive. The Sustainable Fisheries Act of 1996 (Public Law 104-297), amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for Essential Fish Habitat (EFH) descriptions in federal Fisheries Management Plans (FMPs) and to require federal agencies to consult with NMFS on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all fishery management councils to amend their FMPs to describe and identify EFH for each managed fishery. The Act also requires consultation for all federal agency actions that may adversely affect EFH (i.e., direct versus indirect effects); it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside of EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of the activity's location. Under section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless state or private actions require a federal permit or receive federal funding.

NMFS strongly encourages efforts to streamline EFH consultation and other federal consultation processes. EFH consultation can be consolidated, where appropriate, with interagency consultation, coordination and environmental review procedures required by other statutes such as the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, Clean Water Act, FESA, and Federal Power Act. EFH consultation requirements can be satisfied using existing review procedures if they provide NMFS timely notification of actions that may adversely affect EFH and the notification meets requirements for EFH Assessments (i.e., a description of the proposed action, an analysis of the effects, and the Federal agency's views regarding the effects of the action on EFH and proposed mitigation, if applicable).

Migratory Bird Protection Act (MBTA)

The MBTA prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs and nests. Executive Order 13186 of the MBTA instructs federal agencies to coordinate with USFWS in developing a Memorandum of Understanding to conserve migratory bird populations when taking actions that would likely have a negative impact.

Bald and Golden Eagle Protection Act

Under the BEPA, it is illegal to import, export, molest, disturb, sell, purchase or barter any bald eagle or golden eagle or part thereof.

Wetlands

Clean Water Act (CWA)

The CWA regulates discharges to waters of the U.S. and is the principal federal law protecting the nation's surface waters, including seas, lakes, rivers, streams, wetlands, natural ponds, mud flats, sand flats, sloughs, and wet meadows. Section 401 requires projects that could affect state water quality, and that have a federal component, to obtain state certification. Section 402 of the CWA regulates construction-related stormwater discharges through the National Pollutant Discharge Elimination System (NPDES) program. Administered by the USEPA, in California the State Water Resources Control Board (SWRCB) is authorized to oversee the NPDES program. The USACE administers Section 404 of the CWA and coordinates with the U.S. Environmental Protection Agency (USEPA) to regulate the discharge of dredged and fill materials into waters of the U.S. via a permitting process.

State

Special-status Species

The CDFW administers several laws and programs designed to protect biological resources, and designates state threatened, endangered, and other special-status species occurring in California.

California Endangered Species Act (CESA)

The CESA regulates the listing and "take" of state-listed T&E species. CDFW may allow take of a listed species through special permit issuance, except for fully protected species.

Fully Protected Species

CDFG code sections 3511, 4700, 5050 and 5515 designate fully protected species and protection measures. Fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except when collecting these species is necessary for scientific research and relocation of bird species is necessary for livestock protection.

Protection of Nesting Birds

Nesting birds are protected under CDFG code sections 3503 and 3503.5, which make it (1) unlawful to take, possess, or destroy the nests or eggs of any such bird of prey (i.e., species in the order Falconiformes and Strigiformes) except as otherwise provided by the code; and (2) protect the active nests of all other birds (except English sparrow (Passer domesticus) and European starling (Sturnus vulgaris)). Disturbance that causes nest abandonment and/or reproductive failure is considered a take. No take permits are issued under these statutes.

Species of Special Concern (CSC)

The CDFW designates species of special concern, which are species with limited distribution, diminishing habitat, and declining populations, or species that otherwise possess unusual scientific, recreational, or educational value. The Species of Special Concern list is intended to be a land-use management tool.

Native Plant Protection Act (NPPA)

CDFG code sections 1900-1913 comprise the NPPA and seek to preserve, protect, and enhance rare or endangered California plants. The agency is responsible for establishing criteria to determine what native plants are rare or endangered, and for governing the take, possession, propogation or sale of such plants. The California Native Plant Society (CNPS) also identifies rare or endangered plants and lists them as 1A, 1B, 2, 3, and 4 species. Plants appearing on CNPS List 1A, 1B, or 2 meet CEQA significance criteria and CDFG sections 1901, 2062 and 2067 criteria as rare or endangered species.

Wetlands

CDFG §1602

Activities that would interfere with the natural flow of, or substantially alter the channel, bed or bank of, a lake, river, or stream are regulated under CDFG Section 1602.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act transfers oversight authority of the Clean Water Act NPDES program from the federal USEPA to the state California State Water Resources Control Board (SWRCB). The state of California oversees this federal program within and throughout the state via Regional Water Quality Control Boards (RWQCB).

Local

Sonoma County General Plan

The Open Space and Resource Conservation Element of the Sonoma County General Plan contains the following goals and objectives related to biotic resources:

Goal OSRC-7: Protect and enhance the County's natural habitats and diverse plant and animal communities.

***Objective OSRC-7.1*:** Identify and protect native vegetation and wildlife, particularly occurrences of special status species, wetlands, sensitive natural communities, woodlands, and areas of essential habitat connectivity.

***Objective OSRC-7.2*:** Designate important Biotic Habitat Areas and update designations periodically using credible data sources.

***Objective OSRC-7.3*:** Establish development guidelines to protect designated Biotic Habitat Areas and assure that the quality of these natural resources is maintained.

***Objective OSRC-7.4*:** Where appropriate, support regulatory efforts by other agencies to protect biotic habitat.

***Objective OSRC-7.5*:** Maintain connectivity between natural habitat areas.

***Objective OSRC-7.6*:** Establish standards and programs to protect native trees and plant communities.

***Objective OSRC-7.7*:** Support use of native plant species and removal of invasive exotic species.

***Objective OSRC-7.8*:** Encourage voluntary efforts to restore and enhance biotic habitat.

***Objective OSRC-7.9*:** Preserve and restore the Laguna de Santa Rosa, San Pablo Bay and Petaluma marshes and other major marshes and wetlands.

***Objective OSRC-7.10*:** Promote production of native marine and shoreline plant and animal habitats along the Pacific Coast and San Pablo Bay shorelines.

Goal OSRC-8: Protect and enhance Riparian Corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation protection of water resources flood control, bank stabilization and other riparian functions and values.

***Objective OSRC-8.2*:** Provide standards for land use and development in streamside conservation areas that protect riparian vegetation, water resources and habitat values while considering the needs of residents, agriculture, businesses and other land users.

***Objective OSRC-8.3*:** Recognize and protect riparian functions and values of undesignated streams during review of discretionary projects.

Marin County General Plan

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.

Policy BIO-1.2: Acquire Habitat. Continue to acquire areas containing sensitive resources for use as permanent open space, and encourage and support public and private partnerships formed to acquire and manage important natural habitat areas, such as baylands, wetlands, coastal shorelines, wildlife corridors, and other lands linking permanently protected open space lands.

BIO-1.3: Protect Woodlands, Forests, and Tree Resources. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7.

BIO-1.5: Promote Use of Native Plant Species. Encourage use of a variety of native or compatible nonnative, non-invasive plant species indigenous to the site vicinity as part of project landscaping to improve wildlife habitat values.

Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodland and forests where they transition to grasslands and other habitat types.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.

BIO-2.9: Promote Early Consultation with Other Agencies. Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special status species at the outset of project planning.

Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

BIO-3.2: Require Thorough Mitigation. Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ratio of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.

BIO-3.b: Comply with Regulations to Protect Wetlands. Continue to require development applications to include the submittal of a wetland delineation for sites with jurisdictional wetlands and to demonstrate compliance with these wetlands policies, standards, and criteria, and with State and federal regulations.

Goal BIO-5: Baylands Conservation. Preserve and enhance the diversity of the baylands ecosystem, including tidal marshes and adjacent uplands, seasonal marshes and wetlands, rocky shorelines, lagoons, agricultural lands, and low-lying grasslands overlying historical marshlands.

BIO-5.4: Restore Marshlands. Enhance wildlife and aquatic habitat value of diked bay marshlands, and encourage land uses that provide or protect wetland or wildlife habitat and do not require diking, filling, or dredging.

BIO-5.5: Protect Freshwater Habitats. Preserve and, where possible, expand habitats associated with freshwater streams, seasonal wetlands, and small former marshes to facilitate the circulation, distribution, and flow of fresh water, and to enhance associated habitat values.

County of Napa

The Conservation Element of the Napa County General Plan contains the following policies relevant to biotic resources:

Goal CON-1: The County of Napa will conserve resources by determining the most appropriate use of land, matching land uses and activities to the land's natural suitability, and minimizing conflicts with the natural environment and the agriculture it supports.

***Policy CON-1*:** The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

***Policy CON-6*:** The County shall impose conditions on discretionary projects which limit development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Goal CON-2: Maintain and enhance the existing level of biodiversity.

Goal CON-3: Protect the continued presence of special-status species, including special-status plants, special-status wildlife, and their habitats, and comply with all applicable state, federal, or local laws or regulations.

Goal CON-4: Conserve, protect, and improve plant, wildlife, and fishery habitats for all native species in Napa County.

Goal CON-5: Protect connectivity and continuous habitat areas for wildlife movement.

***Policy CON-10*:** The County shall conserve and improve fisheries and wildlife habitat in cooperation with governmental agencies, private associations and individuals in Napa County.

***Policy CON-11*:** The County shall maintain and improve fisheries habitat through a variety of appropriate measures, including the following as well as best management practices developed over time (also see Water Resource Policies, below):

a) Consider the feasibility of using reclaimed wastewater as a means of maintaining adequate water flow to support fish life and reduce pollution of the Napa River.

b) Consider all feasible ways to maintain and restore sufficient flows and channel characteristics necessary for fish passage consistent with state and federal guidelines.

c) Undertake and publicize water use conservation strategies necessary to protect and prolong the duration of in-stream flows for aquatic resources including migrating anadromous fish such as steelhead and Chinook salmon.

***Policy CON-12*:** Public water development projects shall provide an adequate release flow of water to preserve fish populations and public access to the water via public lands.

***Policy CON-13*:** The County shall require that all discretionary residential, commercial, industrial, recreational, agricultural, and water development projects consider and address impacts to wildlife habitat and avoid impacts to fisheries and habitat supporting special-status species to the extent

feasible. Where impacts to wildlife and special-status species cannot be avoided, projects shall include effective mitigation measures and management plans including provisions to:

a) Maintain the following essentials for fish and wildlife resources:

    1) Sufficient dissolved oxygen in the water.

    2) Adequate amounts of proper food.

    3) Adequate amounts of feeding, escape, and nesting habitat.

    4) Proper temperature through maintenance and enhancement of streamside vegetation, volume of flows, and velocity of water.

b) Ensure that water development projects provide an adequate release flow of water to preserve fish populations.

c) Employ supplemental planting and maintenance of grasses, shrubs and trees of like quality and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife and special-status species and maintain the watersheds, especially stream side areas, in good condition.

d) Provide protection for habitat supporting special-status species through buffering or other means.

e) Provide replacement habitat of like quantity and quality on- or off-site for special status species to mitigate impacts to special-status species.

f) Enhance existing habitat values, particularly for special-status species, through restoration and replanting of native plant species as part of discretionary permit review and approval.

g) Require temporary or permanent buffers of adequate size (based on the requirements of the subject special-status species) to avoid nest abandonment by birds and raptors associated with construction and site development activities.

h) Demonstrate compliance with applicable provisions and regulations of recovery plans for federally listed species.

***Policy CON-26*:** Consistent with Napa County's Conservation Regulations, natural vegetation retention areas along perennial and intermittent streams shall vary in width with steepness of the terrain, the nature of the undercover, and type of soil. The design and management of natural vegetation areas shall consider habitat and water quality needs, including the needs of native fish and special status species and flood protection where appropriate. Site-specific setbacks shall be established in coordination with Regional Water Quality Control Boards, California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration National Marine Fisheries Service, and other coordinating resource agencies that identify essential stream and stream reaches necessary for the health of populations of native fisheries and other sensitive aquatic organisms within the County's watersheds.

Where avoidance of impacts to riparian habitat is infeasible along stream reaches, appropriate measures will be undertaken to ensure that protection, restoration, and enhancement activities will occur within these identified stream reaches that support or could support native fisheries and other sensitive aquatic organisms to ensure a no net loss of aquatic habitat functions and values within the county's watersheds.

***Policy CON-30*:** All public and private projects shall avoid impacts to wetlands to the extent feasible. If avoidance is not feasible, projects shall mitigate impacts to wetlands consistent with state and federal policies providing for no net loss of wetland function.

***Policy CON-31*:** The County shall maintain and improve marshland habitat in the southern part of the county through a variety of appropriate measures, including:

a) Utilize reclaimed wastewater for salinity control and management of marshlands, meadows, and salt ponds.

***Policy CON-32*:** The County shall maintain and improve slough and tidal mudflats habitat with appropriate measures, including the following:

a) Filling, dredging, draining, and polluting of mudflats and sloughs should be restricted to provide an adequate supply of oxygen, retain habitat, and maintain food organism production to conserve fish and wildlife and reduce pollution.

b) Utilize reclaimed wastewater for salinity control of mudflats and sloughs where needed.

The City of San Rafael

The following goals and policies from the City of San Rafael's General Plan are relevant to biological resources considerations for the Project:

Goal 33: Protected Habitat. It is the goal of San Rafael to have enhanced habitat for native plants and animals, and special protection for species that are listed as threatened or endangered.

CON-1. Protection of Environmental Resources. Protect or enhance environmental resources, such as ridgelines, wetlands, diked baylands, creeks and drainageways, shorelines and habitat for threatened and endangered species.

CON-2. Wetlands Preservation. Require appropriate public and private wetlands preservation, restoration and/or rehabilitation through compensatory mitigation in the development process for unavoidable impacts. Support and promote acquisition of fee title and/or easements from willing property owners.

CON-8. Enhancement of Creeks and Drainageways. Explore enhancement of, and support continuous upgrades to, drainageways to serve as wildlife habitat corridors for wildlife movement and to serve as flood control facilities to accommodate storm drainage. Require creek enhancement and associated riparian habitat restoration/creation for projects adjacent to creeks to maintain storm flows, reduce erosion and maintenance and improve habitat values, where feasible.

CON-9. Native and/or Sensitive Habitats. Protect habitats that are sensitive, rare, declining, unique or represent a valuable biological resource.

CON-10. Impacts to Sensitive Habitats. Minimize impacts to sensitive natural habitats through careful planning. Require compliance with applicable laws and regulations.

CON-11. Wildlife Corridors. Preserve and protect areas that function as wildlife corridors, particularly those areas that provide natural connections permitting wildlife movement between designated sensitive habitats.

CON-13. Threatened and Endangered Species. Preserve and protect threatened and endangered species of plants and animals formally listed consistent with the state and federal endangered species acts including protection of their habitat.

CON-14. Special Status Species. Preserve and protect special status plants and animals, including candidate species for listing under the state and federal endangered species acts, California species of special concern, California Native Plant Society List 1B plants, and other species protected under provisions of California Fish and Game Code.

The City of Novato General Plan 2035

The City of Novato General Plan 2035 contains the following goals and policies related to natural communities and ecological resources:

Goal EL 1: Preserve, enhance and restore natural areas, including Novato's scenic hillsides, waterways, riparian corridors and baylands.

EL 1: Ecology of Creeks and Streams. Preserve and enhance the ecology of creeks and streams, including riparian vegetation. Prohibit further degradation and require restoration of previously-degraded riparian areas as a condition of development approval when restoration is feasible, taking into account the project's size and cumulative impacts.

EL 1a: Waterway and Riparian Protection. Ensure that new development complies with the requirements of the Waterway and Riparian Protection ordinance in the Zoning Code for watercourses shown on Figure EL-1.

EL 3: Wildlife Habitat. Endeavor to preserve and enhance wildlife habitat areas in watercourse areas and control human use of these areas as necessary to protect them.

EL 4: Habitat Restoration. Restore damaged portions of riparian areas to their natural state, wherever feasible.

EL 6: Wetlands Ecology. Preserve and enhance wetlands ecology.

*EL 6a: Wetland Protectio*n. Ensure that new development complies with the requirements of the Wetland Protection and Restoration ordinance in the Zoning Code.

EL 7: Bayland Area Protection. Regulate development in the Bayland Overlay Zone so that it does not encroach into wetlands or sensitive wildlife habitats, provided that this regulation does not prevent all use of a property. Discourage human activity that damages fisheries, or habitat for birds, fish or other wildlife.

EL 11: Species Diversity and Habitat. Protect biological resources, including migratory birds, anadromous fish, and threatened and endangered species, that are necessary to maintain a diversity of plant and animal species.

City of Petaluma

The Petaluma General Plan 2025 contains the following goals and policies related to biology and natural resources that are relevant to the Project:

Goal 4-G-1: Biology & Natural Resources. Protect and enhance biological and natural resources within the Urban Growth Boundary (UGB).

4-P-1: Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy

4-P-2: Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.

4-P-3: Protect special status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare.

Goal 4-G-2: Biology & Natural Resources. Promote resource protection within the Petaluma Watershed to conserve grassland habitats, oak woodlands, and other natural resources that are found in areas between the UGB and the Planning Area boundary.

4-P-5: Support wetland mitigation and oak woodlands restoration in the unincorporated areas outside the UGB.

City of Sonoma

The Environmental Resources Element of the City of Sonoma's General Plan 2020 contains the following goals and policies related to biology and natural resources that are relevant to the Project:

Goal ER-2: Identify, preserve, and enhance important habitat areas and significant environmental resources.

2.2: Preserve habitat that supports threatened, rare, or endangered species identified by State or federal agencies.

2.3: Protect and, where necessary, enhance riparian corridors.

2.5: Require erosion control and soil conservation practices that support watershed protection.

2.6: Preserve existing trees and plant new trees.

2.9: Require development to avoid potential impacts to wildlife habitat, air quality, and other significant biological resources, or to adequately mitigate such impacts if avoidance is not feasible.

City of American Canyon

The Natural and Historic/Cultural Resources Element of the City of American Canyon's General Plan contains the following goals and policies relevant to natural resource considerations for the Project:

Goal 8: Protect and preserve the significant habitats, plants and wildlife that exist in the City and its Planning Area,

***Objective 8.1*:** Maintain data and information regarding areas of significant biological value within the Planning Area to facilitate resource conservation and the appropriate management of development.

Policy 8.1.1: Acquire and maintain the most current information available regarding the status and location of sensitive biological elements (species and natural communities) within the City and, as appropriate, within the Sphere of Influence and Urban Limit Line. (I 8.37)

Policy 8.1.2: Support, where appropriate, state and federal studies of the Napa River wetlands and riverine systems. (l 8.33)

Policy 8.1.3: Identify the most effective and regionally appropriate funding mechanisms for the long-term maintenance. and protection of significant biological resource areas. (I 8.39)

Policy 8.1.4: Regularly monitor and review developments proposed within the City's Planning Area to assess their impacts on local biological resources and to recommend appropriate mitigation measures that the developer and/or government agency can implement. (I 8.30, I 8.37, and 18.38)

***Objective 8.2*:** Balance the preservation of natural habitat areas, including coastal saltmarsh, mixed hardwood forest, oak savannah, and wetland and riparian habitats, with new development in the City.

***Objective 8.3*:** Protect natural drainages and riparian corridors within the American Canyon Planning Area.

8.3.1: Review proposed developments in wetlands and riparian habitats to evaluate their conformance with the following policies and standards:

a. The development plan shall fully consider the nature of existing biological resources and all reasonable measures shall be taken to avoid significant impacts, including retention of sufficient natural open space and undeveloped buffer zones.

b. Development shall be designed and sited to preserve watercourses, riparian habitat, vernal pools, and wetlands in their natural condition, unless these actions result in an unfeasible project, in which case habitat shall be replaced in accord with subsection "g" (below).

c. Where riparian corridors are retained, they shall be protected by an adequate buffer with a minimum 100-foot protection zone from the edge of the tree, shrub, or herb canopy (see policy 8.3.2).

d. Development shall incorporate habitat linkages (wildlife corridors) to adjacent open spaces, where appropriate and feasible.

e. Development shall incorporate fences, walls, vegetative cover, or other measures to adequately buffer habitat areas, linkages or corridors from built environment.

f. Roads and utilities shall be located and designed such that conflicts with biological resources, habitat areas, linkages or corridors are avoided where feasible.

g. Future development shall utilize appropriate open space or conservation easements in order to protect sensitive species or their habitats.

h. Future development shall mitigate unavoidable adverse impacts to waters of the United States, wetlands and riparian habitats (pursuant to the Federal Clean Water Act and the California Fish and Game Code, Section 1600 et seq.) by replacement on an in-kid basis. Furthermore, replacement shall be based on a ratio determined by the California Department of Fish and Game and/or Army Corp. of Engineers in order to account for the potentially diminished habitat values of replacement habitat; Such replacement should occur on the original development site, whenever possible. Alternatively, replacement can be effected, subject to state and federal regulatory approval, by creation or restoration of replacement habitats elsewhere (offsite but preferably within the City's Planning Area), protected in perpetuity by provision for an appropriate conservation easement or dedication. (I 8.21, I 8.30, and I 8.38).

8.3.2: Prohibit development and grading that alters the biological integrity of the Riparian Corridors as depicted on the Biological Habitats Map, unless no feasible alternative exists or the damaged habitat is replaced with habitat of equivalent value

***Objective 8.4*:** Protect local vernal pools as well as the habitats of endangered species living within American Canyon's Planning Area.

Tree Ordinances

Sonoma County

Any person or entity proposing to remove or damage a heritage or landmark tree shall obtain a tree permit. Written permits to plant, remove, cut, cut down, injure or destroy any tree, shrub, plant or flower growing within any county highway are required as well. In relation to the scenic landscape of Taylor, Sonoma, and Mayacamas Mountains, as visible from public roads, grading and removal of trees and other mature vegetation should be minimized. Avoid removal of specimen trees, tree groupings, and windbreaks. (https://library.municode.com/ca/sonoma_county/codes/code_of_ordinances)

Marin County

The ordinances that protect trees in Marin County are the same as those protecting trees in Sonoma County (see above paragraph). More information can be found online at: https://library.municode.com/ca/marin_county/codes/code_of_ordinances.

Napa County

Existing trees six inches in diameter or larger, measured at diameter breast height, (DBH), or tree stands of trees six inches in diameter (DBH) or larger located on a site for which either an administrative or discretionary permit is required shall not be removed until the required permits have been approved by the decision-making body and tree removal has been specifically authorized. Trees to be retained or designated for retention shall be protected through the use of barricades or other appropriate methods to be placed and maintained at their outboard drip line during the construction phase. Where appropriate, the director may require an applicant to install and maintain construction fencing around the trees to ensure their protection during earthmoving activities. Wherever removal of vegetation is necessitated or authorized, the director or designee may require the planting of replacement vegetation of an equivalent kind, quality and quantity. Vegetation required to be preserved but removed either advertently or inadvertently, or before any required permit has been issued, shall be replaced with fifteen-gallon trees at a ratio of 2:1 at locations approved by the director or designee, or replaced with smaller trees at a higher ratio to be determined by the director or designee. (https://library.municode.com/ca/napa_county/codes/code_of_ordinances)

City of San Rafael

No person shall, without a written permit issued pursuant to this chapter, cut, prune, break, injure or remove any living tree in, upon or along any public street, sidewalk or walkway in the city or cut, disturb, or interfere in any way with the roots of any tree in, upon or along any street, sidewalk or walkway, or spray with any chemical or insecticide any tree in, upon or along any public street, sidewalk or walkway, or place any sign, poster, or other fixture on any tree or tree guard, or injure, misuse or remove any device placed to protect any tree in, upon or along any public street, sidewalk, or walkway in the city. Whenever any tree shall, under the authority of a permit issued therefor under this chapter, be cut down or remove in or from any sidewalk area, its butt and roots shall be dug up and removed, or cut level with the ground, as directed by the public works department. In the erection or repair of any building or structure, the owner thereof, or the contractor, if the work is being done by contract, shall place such guards around all nearby trees in, upon or along the public streets, sidewalks and walkways within the city as shall prevent injury to them. (https://library.municode.com/ca/san_rafael/codes/code_of_ordinances)

City of Novato

No existing trees or limbs larger than three inches in diameter shall be removed unless authorized in writing, in advance of removal by the director or as may be authorized by site plan or discretionary permit approval. All existing trees and sizes shall be shown on site plans submitted for project review and incorporated into project design. Removal of any tree species over eight inches in circumference will require the planting of the same species of tree at a ratio equal to two times the caliper inches of the removed tree. Replacement trees shall be a minimum of two inches in diameter. Any tree removed without prior written authorization or approval shall be replaced at a rate equal to four times the caliper inches of the removed tree. (https://library.municode.com/ca/novato/codes/code_of_ordinances)

City of Petaluma

It is unlawful for any person, organization, officer of the city or other public entity to remove any tree, especially any tree that has been designated a heritage or landmark tree, located within the public rights-of-way without first obtaining a tree removal permit, unless, in the opinion of the director of public works or a duly authorized representative, the tree presents a clear danger to public safety. Permits required under this chapter

shall be issued by the director of public works or his duly authorized representative subject to the concurrence of the directors of parks and planning or their duly authorized representatives. (http://www.codepublishing.com/CA/Petaluma/)

City of Sonoma

It is unlawful for any person other than those authorized under emergency circumstances within this chapter to alter, remove, relocate, or cause to be altered, removed, or relocated any tree in any public street, public right-of-way, or public property within the city, unless and until a written permit to do so has first been obtained. Any such permit may be declared void by the public works director, if its terms are violated. This subsection shall not apply to removal of trees required for new street construction, except as authorized under Article V. (https://www.codepublishing.com/CA/Sonoma/)

City of American Canyon

The City requires existing trees to be preserved onsite unless otherwise approved by the city council as a part of the site development plans. Unless specifically approved by the city council, any tree removed shall be replaced on the site. Replacement trees shall be a minimum size of a twenty-four-inch box of the same species unless specifically approved by the city council (http://qcode.us/codes/americancanyon/).

APPENDIX 3.6B

Sensitive Species with Potential to Occur in the NBWRP Phase 2 Area

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING											
ANIMALS											
Invertebrates											
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--/--	Vernal pools in central valley grasslands, Central Coast mountains, South Coast mountains in rain-fed pools.	**Absent.** Known only from one location in Napa County in an isolated pool at the airport, outside the project area. No suitable vernal pool habitat is located along the project alignment.	**Proposed Action**							x[1]
				Storage							x
				Program Element							x
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/--/--	Known from several locations in San Mateo, Alameda, and Sonoma counties and in the hills between Vallejo and Cordelia. It relies on its host plant, *Viola pedunculata*.	**Low potential.** Inhabits coastal prairies, coastal scrub, and grassland habitats where *Viola pedunculata* occurs as a larval host plant. No records in project area; habitat not expected in ROW.	**Proposed Action**							
				Storage							
				Program Element			x				
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE/--/--	Historically known to occur in San Mateo County north to the mouth of the Russian River in Sonoma County. Found in coastal dune or prairie habitat, although some populations found in coastal terrace prairie, coastal bluff scrub and associate non-native grassland habitats. Eggs are laid in the stems of violets.	**Low potential.** Inhabits coastal prairies, coastal scrub, and grassland habitats where *Viola* sp. occurs as a larval host plant. No records in project area; habitat not expected in ROW.	**Proposed Action**							
				Storage							
				Program Element	x		x				
California freshwater shrimp *Syncaris pacifica*	FE/CE/--	Found in low-elevation, low gradient perennial freshwater streams in Sonoma, Marin and Napa Counties where banks are structurally diverse with undercut banks, exposed roots, or overhanging woody debris or vegetation.	**Low potential.** Known to occur in project vicinity with habitat in Sonoma Creek, Napa River, and larger tributaries; no habitat in project areas.	**Proposed Action**		x			x		
				Storage		x			x		
				Program Element							
Fish											
Green sturgeon, southern DPS *Acipenser medirostris*	FT/--/SCC	Adults spawn in freshwater and then return to estuarine or marine environments. Preferred spawning habitat occurs in the lower reaches of large rivers with swift currents and large cobble.	**Absent.** Known to occur in San Pablo Bay. May occasionally stray into nearby estuarine environments. Sacramento River is the only known spawning site for the southern DPS. No habitat in project areas.	**Proposed Action**							
				Storage							
				Program Element							

[1] An "x" denotes the areas where species potential-to-occur was assessed due to historic sightings or the presence of local populations. The likelihood for species' occurrence within an area is presented in the "Potential for Species Occurrence" column.

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
ANIMALS (CONT.)											
Fish (cont.)											
Delta smelt *Hypomesus transpacificus*	FT/CE/--	Found in large, main channels and open areas of the Bay. Restricted to the Sacramento-San Joaquin Delta from San Pablo Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties.	**Absent.** Found in San Pablo Bay during high outflows but not thought to establish permanent populations. Recorded in Napa River during dry years, but are not believed to persist there (Leidy, 2007). May occasionally stray into estuarine environments near San Pablo Bay. No habitat in project areas.	**Proposed Action**					x		
				Storage					x		
				Program Element							
Coho salmon, Central California Coast ESU *Oncorhynchus kisutch*	FE/CE/--	Found in coastal waters and fresh water streams with relatively slow moving water and fine gravel. Found from Baja, California to Alaska.	**Absent.** Believed to be extirpated from San Francisco bay drainages.	**Proposed Action**							
				Storage							
				Program Element							
Steelhead, Central California Coast DPS *Oncorhynchus mykiss*	FT/--/--	Drainages of San Francisco and San Pablo bays, central Calif. Coastal rivers.	**Present.** Steelhead spawn in upper watershed portions of Sonoma Creek and larger tributaries including Schell Creek, Fowler Creek, Carriger Creek, and Rodgers Creek. Juvenile rearing habitat present in various lower stream reaches.	**Proposed Action**	x	x			x	x	x
				Storage	x	x			x	x	x
				Program Element							
Steelhead, Central Valley DPS *Oncorhynchus mykiss*	FT/--/--	Spawns in the Sacramento and San Joaquin Rivers and their tributaries.	**High potential.** Steelhead migrate through San Pablo Bay to upstream spawning grounds in the Sacramento and San Joaquin River basins, with occasional entry into San Pablo Bay streams.	**Proposed Action**	x	x			x	x	x
				Storage	x	x			x	x	x
				Program Element							
Chinook salmon, Sacramento River winter-run *Oncorhynchus tshawytscha*	FE/CE/--	Mostly confined to the Sacramento River where it spawns in the upper reaches of the main steam.	**High potential.** Migrates through San Pablo Bay to upstream spawning grounds in the Sacramento River. Occasional strays into San Pablo Bay area streams.	**Proposed Action**	x	x					
				Storage	x	X					
				Program Element							
Chinook salmon, Central Valley spring-run *Oncorhynchus tshawytscha*	FT/CT/--	Mostly confined to the Sacramento River where it spawns in the upper reaches of the main steam.	**Present.** Migrates through San Pablo Bay to upstream spawning grounds in the Sacramento River. Occasional strays into San Pablo Bay area streams.	**Proposed Action**	x	X					
				Storage	x	x					
				Program Element							

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
ANIMALS (CONT.)											
Amphibians											
California tiger salamander *Ambystoma californiense*	FT/CT/WL	Wintering sites occur in grasslands occupied by burrowing mammals; breeds in ponds, vernal pools, and slow-moving or receding streams.	**Absent.** The project area is outside this species' known range.	**Proposed Action**							
				Storage							
				Program Element							
California red-legged frog *Rana draytonii*	FT/--/SSC	Found in waterways with emergent vegetation and suitable prey. Breed in stock ponds, pools, and slow-moving streams.	**Low potential.** Few occurrences in Sonoma County foothills east and west of Petaluma, including ponds near Lakeville Highway; low potential in Schell Creek and Sonoma Creek watersheds and American Canyon.	**Proposed Action**	x				x	x	x
				Storage	x				x	x	x
				Program Element							
Birds											
Western snowy plover *Charadrius alexandrinus nivosus*	FT/--/SSC/BCC (Nesting)	Sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars. Nests in sandy substrate and forages in sandy marine and estuarine bodies.	**Moderate potential.** Suitable breeding habitat at Hamilton airfield near Bel Marin Keys.	**Proposed Action**	x						
				Storage	x						
				Program Element							
Willow flycatcher *Empidonax traillii*	--/CE/BCC (Nesting)	Inhabits willow thickets bordering wet meadows, ponds and backwaters, from 2000-8000 feet elevation.	**Low potential.** Potential habitat available in Sonoma Valley; breeding not known from project area.	**Proposed Action**		x					
				Storage		x					
				Program Element							
California black rail *Laterallus jamaicensis coturniculus*	--/CT/FP/BCC	Occurs in salt and brackish marshes, also freshwater marshes at low elevations.	**High potential.** Known to occur in tidal marshes of San Pablo Bay and larger tributary drainages in the Novato and Sonoma service areas.	**Proposed Action**	x	x					
				Storage	x	x					
				Program Element							
Ridgway's rail *Rallus obsoletus*	FE/CE/FP	Occurs in salt marshes and tidal sloughs. Requires tidal mudflats for foraging habitat. Prefers cordgrass for cover and nesting, but can be occasionally found in bulrush and cattails.	**High potential.** Present in Novato Creek near Highway 101. Known to occur in tidal marshes of San Pablo Bay and larger tributary drainages in the Novato and Sonoma service areas.	**Proposed Action**	x						
				Storage	x						
				Program Element							

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
ANIMALS (CONT.)											
Birds (cont.)											
California least tern *Sterna antillarum browni*	FE/CE/FP (Nesting colony)	Lives along the coast with nesting habitat on open beaches free of vegetation due to the tide. Ranges from San Francisco to Baja California. Winters in Mexico.	**Low potential.** No suitable nesting habitat in the project area.	**Proposed Action**							
				Storage							
				Program Element							
Northern spotted owl *Strix occidentalis caurina*	FT/CT/SCC	Requires multi-layered, multi-species tree canopy with moderate to high canopy closure. Large standing trees with snags or cavities and sufficient open space among lower branches are preferred for nesting.	**Low potential.** No suitable nesting habitat in the project area; species may forage in the vicinity from nesting sites in Sonoma and Marin hills.	**Proposed Action**							
				Storage							
				Program Element							
Swainson's hawk Buteo swainsoni	-/CT/-	Nests in large trees, often near water, open grasslands, or agricultural lands.	**High potential.** CNDDB records nesting habitat within ½-miles of Soscol site and foraging habitat is available in American Canyon and Napa project areas.	**Proposed Action**					x		x
				Storage					x		x
				Program Element					x		
Mammals											
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE/CE/FP	Tidally-influenced salt marshes with dense pickleweed and upland transitional vegetation of San Francisco Bay and tributaries.	**High potential.** Known or expected in emergent pickleweed salt marshes in the Sonoma, and Novato service areas; also in Napa near Soscal site. Small habitat impacts possible at Hamilton.	**Proposed Action**	x						
				Storage	x						
				Program Element					x		
PLANTS											
Sonoma alopecurus *Alopecurus aequalis var. sonomensis*	FE/--/1B.1	Freshwater marshes and swamps, and riparian scrub. El. 5 - 365 meters.	**Low potential.** Based on CNDDB records the closest record is over 9 miles to the north of Petaluma. Suitable habitat is not present in the project areas.	**Proposed Action**							
				Storage							
				Program Element							
Sonoma sunshine *Blennosperma bakeri*	FE/CE/1B.1	Mesic valley and foothill grassland and vernal pools. El. 10 - 110 meters.	**Moderate potential.** Based on CNDDB records the closest record is 0.5 miles to the north-northwest of the SVCSD pipeline. Valley and foothill grasslands is present in the vicinity of the project area, but the alignment area is disturbed.	**Proposed Action**		x					
				Storage		x					
				Program Element		x	x				

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
PLANTS (CONT.)											
Tiburon mariposa lily *Calochortus tiburonensis*	FT/CT/1B.1	Open, rocky slopes in serpentine soils of valley and foothill grassland. El. 50 – 150 meters.	**Low potential.** Known to occur in a single location in Marin County, at the Ring Mountain Preserve at the north end of the Tiburon Peninsula, approx. 1.6 miles south of the MMWD site.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Tiburon paintbrush *Castilleja affinis* var. *neglecta*	FE/CT/1B.2	Valley and foothill grassland, rocky serpentine sites. El. 75 – 400 meters.	**Low potential.** Nearest known populations are 1.6 miles to the east of American Canyon and 1.6 miles south of the MMWD project area. No suitable habitat present at these project sites.	**Proposed Action**				x			x
				Storage				x			x
				Program Element							
Soft bird's beak *Cordylanthus mollis* spp. *Mollis*	FE/CR/1B.2	Found in coastal salt marshes and swamps on north shores of San Francisco Bay. El. 0 -3 meters.	**Low potential.** Populations occur in Fagan Slough at the mouth of Napa River, and in the Napa Salt Marsh greater than 1 mile from American Canyon pipelines.	**Proposed Action**					x		x
				Storage					x		x
				Program Element							
Golden larkspur *Delphinium luteum*	FE/CR/1B.1	Chaparral, coastal prairie and rocky coastal scrub. El. 0 - 100 meters.	**Low potential.** The closest CNDDB occurrence is 2.7 miles to the west of Petaluma project area. Suitable habitat is not present in the Petaluma project area.	**Proposed Action**						x	
				Storage						x	
				Program Element							
Marin western flax *Hesperolinon congestum*	FT/CT/1B.1	Chaparral, valley and foothill grassland. In serpentine barrens and in serpentine grassland and chaparral. El. 5 -370 meters.	**Low potential.** Project area does not contain serpentine grasslands. Closest CNDDB record is 2.7 miles to the north west of Novato SD, and 1.6 miles south of the MMWD.	**Proposed Action**	x			x			
				Storage	x			x			
				Program Element							
Santa Cruz tarplant *Holocarpha macradenia*	FT/CE/1B.1	Grassland, coastal prairie; often with nonnatives in light sandy or sandy clay soil. El. 10 - 220 meters.	**Low potential.** Nearest known occurrence is a possibly extirpated population in the vicinity of Ross Valley, 2.7 miles from the MMWD.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Burke's goldfields *Lasthenia burkei*	FE/CE/1B.1	Mesic meadows and seeps, and vernal pools. El. 15 - 600 meters.	**Low potential.** Nearest known occurrence is 7.4 miles north of Petaluma, in the Santa Rosa vernal pool plain.	**Proposed Action**						x	
				Storage						x	
				Program Element							

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
PLANTS (CONT.)											
Contra Costa goldfields *Lasthenia conjugens*	FE/--/1B.1	Cismontane woodland, alkaline playas, valley and foothill grassland and vernal pools. El. 0 - 470 meters.	**Low potential.** The 2005 extant occurrence is 2 miles north of American Canyon and 2 miles south of Napa SD proposed pipelines. One possibly extirpated population is 0.8 miles west of the Napa SD.	**Proposed Action**					x		x
				Storage					x		x
				Program Element							
Pitkin marsh lily *Lilium pardalinum* ssp. *pitkiense*	FE/CE/1B.1	Mesic, sandy in cismontane woodlands, meadows and seeps, marshes and swamps (freshwater). El. 35 – 65 meters.	**Low potential.** The closest CNDDB record is possibly extirpated in Petaluma. Suitable habitat is not present in the Petaluma project area.	**Proposed Action**							
				Storage							
				Program Element							
Sebastopol meadowfoam *Limnanthes vinculans*	FE/CE/1B.1	Vernally mesic, found in meadows and seeps, valley and foothill grassland, and vernal pools. El. 15 - 305 meters.	**Low potential.** The closest CNDDB record is 5.6 miles to the north of Petaluma. Suitable habitat not present in Petaluma project area.	**Proposed Action**						x	
				Storage						x	
				Program Element							
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE/CE/1B.1	Grasslands, usually dry rocky or grassy slopes with serpentine soils. El. 135 – 620 meters.	**Low potential.** The nearest occurrence is extirpated and located 0.3 miles to the north northwest from the MMWD pipeline.	**Proposed Action**				x			
				Storage				x			
				Program Element							
North Coast semaphore grass *Pleuropogon hooverianus*	--/CT/1B.1	Broad-leafed upland forest, meadows and seeps and open areas in mesic north coast coniferous forest. El. 10 – 671 meters.	**Low potential.** The closest CNDDB record is located 4.5 miles to the south southwest of the Petaluma alignment. Suitable habitat is not present in the project area.	**Proposed Action**						x	
				Storage						x	
				Program Element							
Tiburon jewelflower *Streptanthus niger*	FE/CE/1B.1	Shallow, rocky serpentine slopes of valley and foothill grassland. El. 30 – 150 meters.	**Low potential.** Known only from Marin County on the Tiburon Peninsula, the nearest occurrence is 3.4 miles south from MMWD pipeline.	**Proposed Action**					x		
				Storage					x		
				Program Element							

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE LISTED SPECIES OR PROPOSED FOR LISTING (cont.)											
PLANTS (CONT.)											
Two-fork clover *Trifolium amoenum*	FE/--/1B.1	Valley and foothill grasslands, sometimes serpentine soils, swales, coastal bluff scrub. El. 5 – 415 meters.	**Low potential.** The closest CNDDB occurrence is 0.02 miles to the east of the American Canyon pipeline and is presumed extant. This pipeline is in disturbed areas and habitat is not likely to be present. Petaluma occurrence is 2.3 miles to the west and is presumed extant. Presumed extant occurrence is located 0.75 miles northwest of the Napa SD.	**Proposed Action**					x	x	x
				Storage					x	x	x
				Program Element							
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN											
ANIMALS											
Invertebrates											
Monarch butterfly (wintering sites) *Danaus plexippus*	--/--	Throughout California. Overwinters in coastal Monterey pine, Monterey cypress, and eucalyptus groves in California.	**High potential.** Found in China Camp State Park south of Hamilton from late winter to early spring. Roosting trees at Sears Point near Novato pipeline. No impacts are expected.	**Proposed Action**	x	x		x			
				Storage	x	x		x			
				Program Element	x	x					
Fish											
Longfin smelt *Spirinchus thaleichthys*	Candidate/CT/ SSC	Occurs in the middle or bottom of water column in salt or brackish water. Concentrated in Suisun Bay, and lower reaches of Sacramento and San Joaquin Rivers, but may be found throughout San Francisco Bay.	**Low potential.** This species is known to occur in San Pablo Bay, tidal reaches of the Napa river and associated marshes, and historically in the lower Petaluma River.	**Proposed Action**	x	x			x		
				Storage	x	x			x		
				Program Element	x	x			x		
Reptiles & Amphibians											
Western pond turtle *Actinemys marmorata*	--/--/SSC	Fresh water lakes, ponds, reservoirs, and slow-moving streams and rivers edged with sandy soils for laying eggs. Primarily in foothills and lowlands.	**High potential.** Species has cosmopolitan distribution. Known to occur in Napa, Sonoma and Marin County major creeks, tributary drainages, and agricultural ponds.	**Proposed Action**	x	x			x	x	x
				Storage	x	x	x		x	x	
				Program Element	x	x	x		x	x	x
Foothill yellow-legged frog *Rana boylii*	--/--/SSC	Partly shaded, rocky, typically perennial streams at low to moderate altitudes, in chaparral, woodland or forest habitat.	**Low potential.** The preferred habitat of this species is not present in intermittent or perennial project area crossings, which are in developed areas.	**Proposed Action**		x			x	x	
				Storage		x			x	x	
				Program Element		x			x	x	

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FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
ANIMALS (CONT.)											
Birds											
Short-eared owl *Asio flammeus*	--/--/SSC (Nesting)	Open areas with few trees such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Nests on the ground in a depression concealed by vegetation.	**Moderate potential.** Nesting sites are potentially present at proposed storage reservoirs.	**Proposed Action**	x	x			x		
				Storage	x	x			x		
				Program Element							
Cooper's hawk *Accipiter cooperii*	--/WL/-- (Nesting)	Nests in riparian growths of deciduous trees and live oak woodlands.	**Moderate potential.** Nesting sites are available throughout wooded riparian margins within parts of the Sonoma, Napa, and Novato service areas. No documented nesting sites near alignment.	**Proposed Action**	x	x			x		
				Storage	x	x			x		
				Program Element							
Tricolored blackbird *Agelaius tricolor*	--/Candidate Endangered/ SSC/BCC (Nesting colony)	Breeding colonies observed in Sacramento Valley. Nests located over or near fresh emergent wetlands with tall, dense cattails or tules but also in thickets of willow, blackberry, wild rose, and tall herbs.	**Moderate potential.** 1997 record of nesting population at Sears Point; potential habitat near Hamilton. Habitat not expected in ROW.	**Proposed Action**	x	x			x		
				Storage	x	x			x		
				Program Element							
Golden eagle *Aquila chrysaetos*	--/--/FP/BCC 3503.5 (Nesting and wintering)	Open areas and cliff-walled canyons provide nesting habitat, this species nests in large trees, snags, and cliffs. Forages in rolling foothills, mountain areas, flats and deserts.	**Moderate potential.** A single 2003 nesting site in a large eucalyptus tree within 200 feet of Storage pipeline.	**Proposed Action**					x		x
				Storage					x		
				Program Element							
Burrowing owl *Athene cunicularia*	--/--/SSC/BCC (Burrow sites and some wintering sites)	Nests and forages in low-growing grasslands and shrublands with perches and areas that support burrowing mammals.	**Moderate potential.** Recent occurrences in southeastern Napa within 1.0 mile of American Canyon pipeline; 1984 occurrence near Phase 2 pipeline route in south Novato	**Proposed Action**	x				x		x
				Storage	x				x		x
				Program Element	x						
Northern harrier *Circus cyaneus*	--/--/SSC (Nesting)	Mostly nests in emergent vegetation, wet meadows or near rivers and lakes, but may nest in grasslands away from water.	**Moderate potential.** Nesting sites are potentially present at proposed storage reservoirs, booster stations, and in or near cross-country pipelines routes.	**Proposed Action**	x	x		x	x	x	x
				Storage	x		x		x		
				Program Element	x		x				

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FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
ANIMALS (CONT.)											
Birds											
White-tailed kite *Elanus leucurus*	--/--/FP 3503.5 (Nesting)	Nests in oak, willow, or other large tree stands adjacent to wet meadows and open grasslands. Forages over grasslands and agricultural lands.	**Moderate potential.** Nesting sites are available in large oak and eucalyptus trees located throughout the project area.	**Proposed Action**	x	x			x		
				Storage	x	x			x		
				Program Element							
American peregrine falcon *Falco peregrinus anatum*	--/--/FP/BCC 3503.5 (Nesting)	Nests near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes and mounds. Nests is a scrape on a depression or ledge in an open site. Will nest on human-made structures, tree or snags, or old raptor nests. Breeds and feeds near water.	**Low potential.** Suitable nesting sites are limited in the project area.	**Proposed Action**					x		x
				Storage					x		x
				Program Element							
Salt marsh common yellowthroat *Geothlypis trichas sinuosa*	--/--/SSC/BCC	Freshwater, salt and brackish marshes of San Francisco Bay only. Uses willows, tules, and tall grasses for nesting and cover.	**High potential.** Occurs in salt marshes throughout the project area.	**Proposed Action**	x	x			x		
				Storage	x				x		
				Program Element	x	x			x		
San Pablo song sparrow *Melospiza melodia samuelis*	--/--/SCC/BCC	Salt marshes along the north side of San Francisco and San Pablo Bays. Nests in gumweed, fennel and other tall vegetation. Forages over mudflats.	**Present.** San Pablo song sparrow is present in tidal marshes in the Novato and Petaluma service areas.	**Proposed Action**	x	x				x	
				Storage	x					x	
				Program Element	x	x				x	
Mammals											
Pallid bat *Antrozous pallidus*	--/--/SSC	Day roosts are mainly in caves, crevices and mines; also found in buildings and under bark. Forages in open lowland areas.	**High potential.** Roosting habitat available in large diameter oaks and under bridges. Known roosts are present at bridges in Sonoma.	**Proposed Action**	x	x		x	x	x	x
				Storage	x		x		x	x	
				Program Element	x	x	x		x	x	x
Townsend's big-eared bat *Corynorhinus townsendii*	--/--/SSC	Roost in caves and mines and forage in forests and open habitats. Sensitive to human disturbance.	**Low potential.** Range included Petaluma, Novato and Sonoma but suitable roosting habitat is nor present in the project area.	**Proposed Action**	x	x		x			
				Storage	x		x			x	
				Program Element	x	x	x			x	

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FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
ANIMALS (CONT.)											
Mammals (cont.)											
San Pablo vole *Microtus californicus sanpabloensis*	--/--/SSC	Found in salt marshes adjacent to the southeastern part of San Pablo bay.	**Low potential.** May occur in emergent salt marshes in the Novato, and Petaluma service areas, but mainly found on eastern shore of San Pablo Bay.	**Proposed Action**	x					x	
				Storage	x					x	
				Program Element	x					x	
Suisun shrew *Sorex ornatus sinuosus*	--/--/SSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays.	**Moderate potential.** May occur in emergent salt marshes in the Novato, and Petaluma service areas.	**Proposed Action**	x					x	
				Storage	x					x	
				Program Element	x					x	
PLANTS											
Franciscan onion *Allium peninsulare var. franciscanum*	--/--/1B.2	Cismontane woodland, clay, volcanic (often serpentinite) valley and foothill grasslands. El. 52 – 305 meters.	**High potential.** Population occurs 0.2 miles to the north-northeast of the SCWA ASR pipeline and suitable habitat is present. A 1880 site record is within the Petaluma pipeline, but this area does not currently provide suitable habitat.	**Proposed Action**			x				
				Storage			x				
				Program Element							
Napa false indigo *Amorpha californica* var. *napensis*	--/--/1B.2	Chaparral, cismontane woodland, and openings in broad-leafed upland forest. El. 120 - 2000 meters.	**High potential.** Extant population near the SCWA ASR pipeline alignment. Petaluma pipeline is located 2.7 miles northeast of the known occurrence in Olompali State Historic Park. An occurrence located 0.8 miles to north of the MMWD is possibly extirpated.	**Proposed Action**	x	x		x		x	
				Storage	x	x		x		x	
				Program Element	x	x	x			x	
Mt. Tamalpais manzanita *Arctostaphylos hookeri* spp. *montana*	--/--/1B.3	Chaparral and serpentinite, rocky valley and foothill grassland. El. 160 – 760 meters.	**Unlikely.** Closest known CNDDB record is 2.5 miles west of the MMWD pipeline and suitable habitat is not present. Novato SD pipeline is located 6.8 miles northeast of the closest known record.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Alkali milk-vetch *Astragalus tener* var. *tener*	--/--/1B.2	Alkaline soils, playas, valley and foothill grassland (adobe clay), vernal pools. El. 1 – 60 meters.	**Low potential.** Closest CNDDB record overlaps Petaluma pipeline but record is extirpated. Known population is located 0.6 miles south of American Canyon pipeline. Habitat is not present in this area, as the pipelines are located on disturbed habitat.	**Proposed Action**							x
				Storage							x
				Program Element							x

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FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Big-scale balsamroot *Balsamorhiza macrolepis*	--/--/1B.2	Chaparral, cismontane woodland and valley and foothill grassland. El. 90 - 1555 meters.	**High potential.** Closest CNDDB record is 0.3 miles east of the American Canyon pipeline within a developed area that does not provide habitat for this species. A population occurs at SCWA ASR 0.1 miles north of the SVCSD. Valley and grassland habitat present at this location.	**Proposed Action**					x		x
				Storage			x		x		x
				Program Element		x	x				x
Narrow-anthered brodiaea *Brodiaea leptandra*	--/--/1B.2	Volcanic, broad-leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. El. 110 - 915 meters.	**Moderate potential.** Known from the vicinity of Arrowhead Mountain in the SVCSD pipeline area; grasslands present along this alignment. CBDDB record located 0.3 miles north of the SCWA ASR pipeline, habitat present at this location. Skyline Wilderness Park east of the Napa SD is mapped as an extant occurrence.	**Proposed Action**		x			x		
				Storage		x			x		
				Program Element			x				
Thurber's reed grass *Calamagrostis crassiglumis*	--/--/2B.1	Coastal scrub (mesic), Marshes and swamps (freshwater). El. 10 - 60 meters.	**Low potential.** Closest CNDDB location is over 4 miles to the west of MMWD pipeline.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Round-leaved filaree *California macrophylla*	--/--/1B.2	Clay, cismontane woodland, valley and foothill grassland. El. 15 – 1200 meters.	**Low potential.** A 1880 site record is within the Petaluma pipeline, but habitat is not present, as pipeline route is in disturbed habitat.	**Proposed Action**						x	
				Storage						x	
				Program Element						x	
Lyngbye's sedge *Carex lyngbyei*	--/--/2B.2	Marshes and swamps (brackish or freshwater). El. 0 - 10 meters.	**Low potential.** Closest CNDDB record is located 2.1 miles to the west of the American Canyon pipeline in the Napa River. Habitat is not present in the American Canyon project area.	**Proposed Action**							x
				Storage							x
				Program Element							
Rincon Ridge ceanothus *Ceanothus confusus*	--/--/1B.1	Volcanic or serpentinite, closed-cone coniferous forest, chaparral, cismontane woodland. El. 75 – 1065 meters.	**Low potential.** Closest CNDDB record is located 0.6 miles to the north east of the SVCSD pipeline. No suitable habitat is present along the proposed alignment.	**Proposed Action**		x					
				Storage		x					
				Program Element		x					

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Holly-leaved ceanothus *Ceanothus purpureus*	--/--/1B.2	Rocky and volcanic soil in chaparral and cismontane woodland. El. 120 – 640 meters.	**Low potential.** Closest CNDDB record is located 1.2 miles to the east of the Napa SD pipeline. No suitable habitat along the proposed alignment.	**Proposed Action**					x		
				Storage					x		
				Program Element					x		
Sonoma ceanothus *Ceanothus sonomensis*	--/--/1B.2	Sandy, serpentinite or volcanic chaparral. El. 215 – 800 meters.	**Low potential.** Closest CNDDB record is located just over 3 miles to the north and northeast of the pipeline alignments in SCWA. No suitable habitat is present near these alignments.	**Proposed Action**							
				Storage							
				Program Element			x				
Papoose tarplant *Centromadia parryi* spp. *parryi*	--/--/1B.2	Chaparral, coastal prairie, meadows and seeps, coastal marshes and swamps, and vernally mesic valley and foothill grassland. El. 0 - 420 meters.	**Low potential.** The closet CNDDB record is 0.45 miles north of the Petaluma alignment. Closest CNDDB record is located 3.2 miles to the south of the SVCSD alignment. Suitable habitat is not present.	**Proposed Action**		x				x	
				Storage		x				x	
				Program Element						x	
Point Reyes bird's-beak *Chloropyron maritimum* ssp. *palustre*	--/--/1B.2	Coastal salt marsh. El. 0 - 10 meters.	**Moderate potential.** Known population located 0.3 miles to the west of the Petaluma pipeline alignment. Closest CNDDB record to the MMWD pipeline is not within suitable habitat. Potential habitat at Hamilton (turnout to transitional wetlands).	**Proposed Action**	x			x		x	
				Storage	x			x		x	
				Program Element	x					x	
San Francisco spineflower *Chorizanthe cuspidata* var. *cuspidata*	--/--/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. El. 3 - 215 meters.	**Low potential.** Closest CNDDB record is located 4 miles to the west of the MMWD pipeline alignment. Suitable habitat is potentially in the vicinity of the alignment.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Western leatherwood *Dirca occidentalis*	--/--/1B.2	Mesic valley and foothill grassland and vernal pools. El. 25 - 425 meters.	**Low potential.** Closest CNDDB record is 6.5 miles west-southwest of MMWD, and 7.7 miles south of American Canyon pipeline alignment.	**Proposed Action**				x			x
				Storage				x			x
				Program Element							x

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Dwarf downingia *Downingia pusilla*	--/--/2B.2	Mesic valley and foothill grassland and vernal pools. Known to occur in Napa, Sonoma and Solano counties. El. 1 - 445 meters.	**Low potential.** The closest CNDDB record is located 0.8 miles to the south of SVCSD alignment and is from 1892. Suitable grassland habitat is likely present along this alignment. CNDDB record is located 1 mile west of the SCWA alignments. Suitable grassland habitat is likely present along this alignment. CNDDB record is 1.6 miles north of American Canyon is presumed extant.	**Proposed Action**		x			x		x
				Storage		x			x		x
				Program Element							x
Greene's narrow-leaved daisy *Erigeron greenei*	--/--/1B.2	Serpentinite or volcanic chaparral. El. 80 - 1005 meters.	**Low potential.** Skyline Wilderness Park to the east of the Napa SD supports an extant population. Chaparral habitat is not present along the alignment.	**Proposed Action**					x		
				Storage					x		
				Program Element							
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/1B.2	Chaparral, Cismontane woodland, coastal prairie and serpentinite, sandy to gravelly valley and foothill grassland. El. 0 - 700 meters.	**Low potential.** The closest CNDDB record is located 1.6 miles south of the MMWD alignment in the Ring Mountain Preserve. Suitable habitat is not likely present at this location. CNDDB record is located 3 miles to the north northeast of the Novato SD alignment in the Mt. Burdell Open Space Preserve.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Fragrant fritillary *Fritillaria liliacea*	--/--/1B.2	Coastal prairie and scrub, grasslands, often on serpentine soils. El. 3 - 410 meters.	**Low potential.** A 1880 site record is within the Petaluma pipeline. Population located 1.2 miles southwest of the SCWA alignment in the Van Hoosear Wildflower Preserve. Closest CNDDB record is located 1.9 miles northwest of the Novato SD alignment. Suitable habitat is not likely to be present at this location.	**Proposed Action**	x						
				Storage	x						
				Program Element			x				
Congested-headed hayfield tarplant *Hemizonia congesta* ssp. *congesta*	--/--/1B.2	Coastal scrub and valley and foothill grassland (sometimes roadsides). El. 20 – 560 meters.	**Moderate potential.** CNDDB record from 1909 within SVCSD alignment. Grasslands and roadsides are present in the project area. In Petaluma, closest CNDDB record is located 1.1 miles north from 1916. Closest CNDDB record is located 0.5 miles south of Novato SD alignment. Suitable habitat present in project area.	**Proposed Action**	x	x				x	
				Storage	x	x				x	
				Program Element	x	x				x	

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Thin-lobed horkelia *Horkelia tenuiloba*	--/--/1B.2	Coastal scrub, chaparral, sandy soils, mesic openings. El. 50 - 500 meters.	**Low potential.** The closest CNDDB record is located 4.2 miles southwest of the MMWD alignment. Suitable habitat is not present in the alignment. Closest CNDDB record is located 3.2 miles northeast of the SCWA. Mesic openings may occur in the project area.	**Proposed Action**		x	x				
				Storage		x	x				
				Program Element		x					
Carquinez goldenbush *Isocoma argute*	--/--/1B.1	Valley and foothill grassland (alkaline). El. 1 - 20 meters.	**Low potential.** The closest CNDDB record is 2.7 miles southeast of American Canyon pipeline alignment along the Carquinez Strait. All other known occurrences as located east and southeast of Fairfield.	**Proposed Action**							x
				Storage							x
				Program Element							x
Northern California black walnut *Juglans hindsii*	--/--/1B.1	Riparian forest and woodland. El. 0 - 440 meters.	**Low potential.** The closest CNDDB is located 1.2 miles northwest along the Napa River from the Napa SD alignment. There is no suitable habitat along the Napa SD alignment.	**Proposed Action**					x		
				Storage					x		
				Program Element					x		
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	--/--/1B.2	Freshwater and brackish marshes and swamps. El. 0 - 5 meters.	**Low potential.** Closest CNDDB occurrence that is presumed extant is 0.8 miles to the south-southwest of Napa alignment, in the marsh along the Napa River. The Napa SD alignment does not have habitat for this species. Closest CNDDB record to American Canyon is located in the Fagan Marsh Ecological Preserve, 1.5 miles to the northwest of the pipeline route.	**Proposed Action**					x		x
				Storage					x		
				Program Element					x		
Legenere *Legenere limosa*	--/--/1B.1	Chaparral and cismontane woodland (usually volcanic). El. 100 - 500 meters.	**Low potential.** The closest CNDDB records are located 1.9 miles south of the Napa SD alignment and 2.1 miles north of the American Canyon alignment. No suitable habitat is present in the Napa SD alignment.	**Proposed Action**					x		x
				Storage					x		
				Program Element					x		x
Jepson's leptosiphon *Leptosiphon jepsonii*	--/--/1B.2	Chaparral and cismontane woodland (usually volcanic). El. 100 - 500 meters.	**Low potential.** The closest CNDDB record is located 4.7 miles northwest of the SCWA alignment. Cismontane habitat is present but most known occurrences are located further north. Closest CNDDB occurrence to Napa is located 2.9 miles to the northwest of the alignment. Suitable habitat is not present.	**Proposed Action**					x		
				Storage					x		
				Program Element			x		x		

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Tamalpais lessingia *Lessingia micradenia* var. *micradenia*	--/--/1B.2	Valley and foothill grassland which is usually serpentinite, often roadsides. El. 100 - 500 meters.	**Low potential.** The closest known occurrences are located 3.9 miles to the west of the MMWD in the Mt. Tamalpais area. Although this species may occur on roadsides, the MMWD alignment is highly disturbed and invaded.	**Proposed Action**				x			
				Storage				x			
				Program Element							
Mason's lilaeopsis *Lilaeopsis masonii*	--/CR/1B.1	Brackish or freshwater marshes and swamps and riparian scrub. El. 0 - 10 meters.	**Low potential.** Many known occurrences concentrated along Napa River. The only suitable habitat present in the Napa SD alignment is riparian scrub in the channel. Closest CNDDB record is located 2.5 miles to the south of the American Canyon alignment. No suitable habitat is present in the vicinity of the alignment.	**Proposed Action**					x		x
				Storage					x		x
				Program Element							
Cobb Mountain lupine *Lupinus sericatus*	--/--/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest. El. 275 – 1525 meters.	**Low potential.** Closest CNDDB location is 3.9 miles to the north east of the SCWA. Suitable habitat is not present.	**Proposed Action**			x				
				Storage			x				
				Program Element							
Marsh microseris *Microseris paludosa*	--/--/1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. El. 5 – 355 meters.	**Low potential.** The closest CNDDB habitat is located 0.9 miles west of the MMWD alignment, dated from 1886. Closest CNDDB record is 3.8 miles to the north west of the Petaluma alignment from 1937.	**Proposed Action**				x		x	
				Storage				x		x	
				Program Element							
Baker's navarretia *Navarretia leucocephala* ssp. bakeri	--/--/1B.1	Usually in adobe or alkaline soils in vernal pools, swales, and wet areas in woodlands, in meadows and seeps, in grassland, and in coniferous forest. El. 5 – 1740 meters.	**Low potential.** This species is present at Mt. Burdell open space located 3.1 miles north-northwest of the Novato alignment. Potential wet areas are located in the vicinity of the Novato alignment are too saline to support this species.	**Proposed Action**	x						
				Storage	x						
				Program Element	x						
Petaluma popcorn flower *Plagiobothrys mollis* var. *vestitus*	--/--/1A	Coastal salt marshes and swamps, mesic valley and foothill grasslands. El. 10 – 50 meters.	**Absent.** Only known from one CNDDB occurrence that is possibly extirpated. This historical CNDDB record overlaps the Petaluma alignment but the habitat is now disturbed.	**Proposed Action**						x	
				Storage						x	
				Program Element						x	

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Chaparral ragwort *Senecio aphanactis*	--/--/2B.2	Chaparral, cismontane woodland, coastal scrub, sometimes alkaline. El. 15 – 800 meters.	**Low potential.** The closest CNDDB record is located 5.2 miles south of American Canyon located on Mare Island. Suitable habitat is not present in the project area.	**Proposed Action**							x
				Storage							x
				Program Element							x
Point Reyes checkerbloom *Sidalcea calycosa* ssp. *rhizomata*	--/--/1B.2	Freshwater marshes and swamps near the coast. El. 3 – 75 meters.	**Low potential.** A 1880 site record is within the Petaluma pipeline alignment. This occurrence is presumed extant, but needs field work. Potential suitable habitat is present in the project vicinity. Closest CNDDB occurrence is located 5.5 miles to the north west of the MMWD alignment. This record is only known from a 1922 collection. There is potentially suitable habitat in the project area.	**Proposed Action**				x		x		
				Storage				x		x	
				Program Element							
Mt. Tamalpais bristly jewelflower *Streptanthus glandulosus* ssp. *pulchellus*	--/--/1B.2	Chaparral and serpentinite valley and foothill grassland. Endemic to Marin County. El. 150 – 800 meters.	**Low potential.** The closest CNDDB record is located 2.5 miles to the south west of the Novato SD alignment. Potential grassland habitat is located in the project area. The closest CNDDB record is located 5.7 miles to the west of the MMWD alignment and is located in the Mt. Tamalpais.	**Proposed Action**	x						
				Storage	x						
				Program Element							
Suisun Marsh aster *Symphyotrichum lentum*	--/--/1B.2	Brackish and freshwater marshes and swamps. El. 0 - 3 meters.	**Low potential.** Closest CNDDB record is located 0.5 miles east of the Napa SD alignment. in Fagan Marsh. No brackish marsh habitat in the project area.	**Proposed Action**					x		x
				Storage					x		x
				Program Element							
Napa bluecurls *Trichostema ruygtii*	--/--/1B.2	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, and vernal pools. El. 30 – 680 meters.	**Low potential.** The closest CNDDB occurrence is located 3.1 miles northeast of the Napa SD alignment. The grassland habitat in this area is non-native and disturbed.	**Proposed Action**					x		
				Storage					x		
				Program Element							
Saline clover *Trifolium hydrophilum*	--/--/1B.2	Marshes and swamps, mesic valley and foothill grassland, and vernal pools. El. 0 – 300 meters.	**Moderate potential.** The closest CNDDB location is 0.6 miles east of the American Canyon alignment. Mesic grassland habitat is not present in the project area. In Napa, the closest CNDDB record is located 1.2 miles south of the alignment. Suitable grassland habitat is present in the project area. Closest CNDDB record is located 3.4 miles south of the SVCSD alignment. Suitable grassland habitat is present in the project area.	**Proposed Action**		x			x		x
				Storage		x			x		x
				Program Element		x	x		x		

Common Name *Scientific Name*	Listing Status USFWS/ CDFW/CNPS	General Habitat Requirements	Potential for Species Occurrence Within the Project Area	Alternative	Novato SD	SVCSD	SCWA	MMWD	Napa SD	Petaluma	American Canyon
FEDERAL AND STATE SPECIES OF SPECIAL CONCERN (cont.)											
PLANTS (CONT.)											
Oval-leaved viburnum *Viburnum ellipticum*	--/--/2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. El. 215 – 1400 meters.	**Low potential.** CNDDB record from 1914 overlaps the SCWA alignment. Suitable habitat is present in the project area. This same record is 0.2 miles north of the SVCSD alignment. Rare plant surveys in Phase 1 were negative for this species (ESA 2009). CNDDB record 1.4 miles southeast of the Napa SD alignment in Skyline Park. Suitable habitat is present in the project area.	**Proposed Action**			x		x		
				Storage			x		x		
				Program Element			x		x		

Status Codes

Federal Categories (U.S. Fish and Wildlife Service):

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FC = Candidate for Federal Listing

State Categories (California Department of Fish and Wildlife):

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California
3511 = Fully Protected Species
* = Special Animals
CSC = California Species of Special Concern
WL = Watch List

California Rare Plant Rank (CRPR):

Rank 1B = Plants rare, threatened, or endangered in California and elsewhere
Rank 2 = Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3 = A review list of plants about which more information is needed

Threat Sub-Rankings –
0.1: Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2: Fairly endangered in California (20-80% occurrences threatened/ moderate degree and immediacy of threat)
0.3: Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known

[a] Potential to Occur evaluations considered all of the project alignments separately. The highest PTO likelihood was stated with the individual alignments identified with an "**x**" if the likelihood applied.

SOURCES: CDFW, 2017; CNPS, 2017; NMFS, 2017; USFWS, 2017 Sterk_926

APPENDIX 3.6C
Impact Summary by Service Area

This table provides a summary of potential project impacts related to biological resources.

POTENTIAL IMPACTS AND SIGNIFICANCE – BIOLOGICAL RESOURCES

Proposed Action	Impact by Member Agency Service Areas						
	MMWD/ CMSA	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.6.1: Wetlands and Sensitive Natural Communities							
Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.2: Aquatic Species							
Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.3: Reptiles and Amphibians							
Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.4: Nesting Birds							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/LSM	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.5: Mammals							
Proposed Action	NI	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.6: Rare Plants							
Proposed Action	NI	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.6.7: Heritage Trees							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM

NOTES:

NI = No Impact
LSM = Less than Significant Impact with Mitigation Incorporated

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.7
Land Use and Agricultural Resources

3.7A. Regulatory Framework
3.7B. Impact Summary by Service Area

APPENDIX 3.7A
Regulatory Framework

3.7.2 Regulatory Framework

Federal

There are no federal regulations that pertain to land use that are applicable to the proposed action.

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) was passed by Congress in 1981 as part of the Farm Bill. Its purpose is to minimize unnecessary conversion of farmland to nonagricultural uses as a part of federal programs. The FPPA established the Farm and Ranchland Protection Program (FRPP) and a Land Evaluation and Site Assessment system (LESA).[1] The Natural Resources Conservation Service (NRCS) administers the FRPP, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural uses. The program provides matching funds to state, local, and tribal government entities and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses, and retain all rights to the property for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. NRCS provides up to 50 percent of the fair market value of the easement (NRCS, 2009).

State

California Government Code

California Planning and Zoning Law requires each planning agency to prepare and the legislative body of each county and city to adopt a comprehensive, long-term general plan for the physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning.

The general plan consists of a statement of development policies and includes a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. Under Section 65302, the plan is required to include the following elements:

1) Land Use Element
2) Circulation Element
3) Housing Element
4) Conservation Element
5) Open Space Element
6) Noise Element
7) Safety Element
8) Environmental Justice Element

[1] The federal Land Evaluation and Site Assessment system uses the same acronym, LESA, as used by the California Department of Conservation farmland evaluation and site assessment program.

California Farmland Mapping and Monitoring Program

The California Department of Conservation, under the Division of Land Resource Protection, has established the Farmland Mapping and Monitoring Program (FMMP). The FMMP monitors the conversion of the state's farmland to and from agricultural use. The map series identifies eight classifications and uses a minimum mapping unit size of 10 acres. The FMMP also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The FMMP maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. Important farmlands are divided into the following five categories based on their suitability for agriculture.

1. **Prime Farmland.** Prime Farmland is land with the best combination of physical and chemical characteristics able to sustain long-term production of agricultural crops. This land has produced irrigated crops at some time within the four years prior to the mapping date.

2. **Farmland of Statewide Importance.** Farmland of Statewide Importance is land that meets the criteria for Prime Farmland but with minor shortcomings such as greater slopes or lesser soil moisture capacity.

3. **Unique Farmland.** Unique Farmland has even lesser quality soils and produces the state's leading agricultural crops. This land is usually irrigated but also includes non-irrigated orchards and vineyards.

4. **Farmland of Local Importance.** Farmland of Local Importance is land that is important to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

5. **Grazing Land.** Grazing Land is land on which the existing vegetation is suited to the grazing of livestock.

Williamson Act

The California Land Conservation Act of 1965, also known as the Williamson Act, is designed to preserve agricultural and open space lands by discouraging their premature and unnecessary conversion to urban uses (CDC, 2016d). The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict their land to agricultural and compatible open-space uses. In return, Williamson Act contracts offer tax incentives by ensuring that land would be assessed for its agricultural productivity rather than its highest and best use. Contracts run for a period of ten years; however, some jurisdictions exercise the option of making them long term, up to twenty years. Contracts are automatically renewed unless the landowner files for non-renewal or petitions for cancellation. Williamson Act contracts can be divided into the following categories: Prime Agricultural Land, Non-Prime Agricultural Land, Open Space Easement, Built Up Land, and Agricultural Land in Non-Renewal.

San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan

The San Francisco Bay Plan (SF Bay Plan), prepared by the San Francisco Bay Conservation and Development Commission (BCDC) in 1968 in accordance with the McAteer-Petris Act of 1965, is an enforceable plan that guides the protection and use of San Francisco Bay and its shoreline. Under the McAteer-Petris Act, BCDC has the authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction and to enforce policies aimed at protecting the bay and its shoreline. The SF Bay Plan designates shoreline areas that should be reserved for water-related purposes like ports, industry, public recreation, airports, and wildlife refuges. Since its adoption by BCDC in 1968, the SF Bay Plan has been amended periodically to keep pace with changing conditions and to incorporate new information concerning the bay. Proposed action facilities could encroach within the jurisdiction of the BCDC and could be subject to certain provisions contained in the SF Bay Plan (BCDC, 2012).

Local

Other Jurisdictions, General Land Use Plans

The following factors affect the application of the NBWRP Phase 2 area communities' General Plans to the Project:

1. **Local Agency Project Approval.** No local agency approvals would be needed for adoption of the Program Elements portions of the Project. Proposed Action Specific and future individual projects could, in select cases, require encroachment permits from local agencies. Current and future project-level CEQA review of the program level projects will provide more detailed and up-to-date information on the approvals required for each project.

2. **Building and Zoning Ordinances.** Building and zoning ordinances represent the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretation of state law mutually exempt public utilities and special-purpose local agencies (such as water districts) from complying with local building and zoning ordinances when locating or constructing facilities for the production, generation, storage, treatment, or transmission of water and wastewater (California Government Code Section 53090 et seq). The NBWRA is comprised of several water and wastewater utility districts, and is therefore exempt from complying with the building and zoning ordinances of other cities and counties.

3. **Local Government Notification and Consistency Determination Requirements.** California Government Code Section 65402(c) requires that the Authority and its member agencies inform cities and counties of its plans to construct projects or acquire or dispose of property. The planning agencies of the affected local cities and counties have 40 days to determine project consistency with their general plans; these consistency determinations are advisory to the Authority rather than binding. Approval of the Program Elements portions of the project would not trigger the requirements of Section 65402(c), however, future implementation of individual project level components would. The Authority and its member agencies would notify local governments of Project facilities to be constructed or upgraded within the city or county as part of any project-level environmental review process. Prior to project implementation, local governments would be notified pursuant to California Government Code Section 65402(c). If the planning agency disapproves the location, purpose or extent of such acquisition, disposition, or the public building or structure, the disapproval may be overruled by the Authority and its member agencies.

Notwithstanding the above, where planned NBWRP Phase 2 components are sited outside of lands owned by the Authority and its Member Agencies, the Authority seeks to work cooperatively with affected local jurisdictions to avoid conflicts with local land use plans and building and zoning codes. For the purposes of this analysis with respect to the discussion of land use, a key issue for local agencies that are affected by project construction and operation is whether or not the project adequately addresses community goals regarding water conservation and service for existing and future agricultural, urban, and environmental uses.

The intent of the general plans prepared by the affected cities and counties is to preserve and improve the quality of life for its citizens and to consider growth in a manner that appropriately reflects the community's values; an adequate, reliable water supply is a chief public service needed to accomplish these goals.

A second issue of importance to local agencies is whether implementation of the Project would be consistent with community goals regarding resource protection. As discussed in Chapter 2, the purpose of the proposed Action is to reduce the reliance on local and imported surface and groundwater and to reduce the discharge of treated wastewater to the San Pablo Bay. **Table A3.7-1** presents an overview of general plan policies and goals that address the protection of environmental resources or the mitigation of environmental impacts. All of the issues identified in the table are addressed in this EIS/EIR in one form or another; some specific policies are used as criteria to determine the significance of physical effects on the environment. **Table 3.7-2** lists the significance criteria that directly relate to consistency with plans and policies and indicates where in this chapter the reader can find the impact evaluation.

Throughout this EIS/EIR, local planning documents and relevant policies are discussed to provide additional information to the public, other agencies, and decision-makers, although these plans and policies may not be directly applicable to the NBWRA and the proposed Action and alternatives.

TABLE A3.7-1: SUMMARY OF GENERAL PLAN POLICIES OF OTHER JURISDICTIONS BY CEQA RESOURCE TOPIC

Resource Topic	Summary Description
Land Use and Visual Quality	General plan goals, policies, and implementation actions related to land use generally call for the use of an environmental review process to minimize potential impacts of projects, and strive to minimize the impact of construction projects on surrounding land uses.
Geology, Soils, and Seismicity	General plan policies related to geology, soils, and seismicity call for appropriate placement, design, and construction of utilities to minimize damage from seismic and geologic hazards and for the implementation of extra precautionary measures to restore utility services following earthquakes. Effective mitigation measures are required for utilities in areas prone to geologic hazards such as soil erosion, liquefaction, and slope failure.
Hydrology and Water Quality	General plan policies related to hydrology and water quality generally deal with the utilization of erosion control measures and storm water quality controls, the protection of riparian zones, and the conservation of water resources in the natural environment. Dam maintenance and monitoring are prescribed in areas potentially subject to dam failure.
Biological Resources	General plan goals, policies, and implementation programs related to biological resources are aimed at the protection of sensitive wildlife habitat and plants, including wetlands, riparian zones, native hardwoods, open space, and sensitive habitats for rare and endangered fish and wildlife species. Heritage tree programs specify guidelines for the avoidance, protection, and, when necessary, replacement of heritage trees. Use of the CEQA/NEPA process to ensure that detrimental biological impacts do not occur is prescribed.
Cultural Resources	General plan policies related to cultural resources prescribe procedures to prevent detrimental impacts on archaeological/paleontological sites during construction, and the use of good planning practices to preserve cultural and historic heritage.
Traffic, Transportation, and Circulation	General plan policies related to traffic, transportation, and circulation generally require an impact analysis of new development proposals on traffic and encourage the use of utility corridors and river/ creek rights-of-way for nonmotorized transportation modes such as bicycle and pedestrian facilities.
Air Quality	General plan policies related to air quality call for air quality impact analyses for proposed actions and the use of air quality controls, such as dust abatement measures during construction, to reduce air quality impacts.
Noise and Vibration	General plan policies related to noise and vibration generally establish enforceable noise thresholds, require the use of noise suppression techniques during construction activities, encourage the incorporation of noise reduction techniques in new structures, and call for compliance with noise ordinances during facility operation.
Public Services and Utilities	General plan policies related to public services and utilities call for safeguarding utility lines from rupture or malfunction from natural or manmade hazards.
Recreational Resources	General plan policies related to recreational resources encourage the use of utility corridors and rights-of-way for recreational uses such as parks, pedestrian and bicycle trails, open space, and other recreational facilities and programs.
Agricultural Resources	General plan policies related to agricultural resources encourage utilities to route their facilities along property lines to prevent interference with agricultural operations.
Hazards	General plan policies related to hazards call for the proper handling, use, disposal, and transport of hazardous materials and the placement, design, construction, and protection of critical utilities from potential disasters.
Energy Resources	No relevant general plan policies related to energy resources were identified.
Geology, Soils, and Seismicity (Section 3.2)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.
Biological Resources (Section 3.6)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

TABLE A3.7-1: SIGNIFICANCE CRITERIA RELATED TO CONSISTENCY WITH PLANS AND POLICIES BY ENVIRONMENTAL RESOURCE TOPIC (CONTINUED)

Resource Topic	Significance Criterion
Traffic, Transportation, and Circulation (Section 3.8)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., conflict with policies promoting bus turnouts, bicycle racks, etc.), or cause a substantial increase in transit demand that cannot be accommodated by existing or proposed transit capacity or alternative travel modes).
Noise and Vibration (Section 3.11)	Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. For a project located within an area covered by an airport land use plan (or, where such a plan has not been adopted, within two miles of a public airport or public use airport), expose people residing or working in the project area to excessive noise levels.

City and County General Land Use Plans

MMWD/CMSA and Novato SD Service Areas

Marin Countywide Plan

Marin County has long maintained a tradition of environmental planning balanced with the recognition of the essential linkages between land use, transportation, and the need for affordable housing (Marin Countywide Plan 2020). The Agricultural and Natural Systems Element and the Built Environment Element both address Land Use issues and establishes policies for guiding land use and development in accordance with planned future growth, including the distribution, location, and extent of land uses and their associated standards of population density and building intensity with respect to water resources, agricultural resources and community development.

Water Resources

The Water Resources section of the Natural Systems Element contains Land Use goals and policies that are relevant to the proposed Action. Goals WR-1 and WR-2 reflect the Marin County Watershed Management Plan's recommendations and aim to preserve and enhance healthy watersheds and maintain adequate water supplies.

Agriculture

The primary objectives of the agriculture goals and policies identified within the Natural Systems and Agricultural Element are preserving agricultural lands and preventing subdivision of lands under agricultural production. The County's agricultural policies presented within the element recognize the value of continued agriculture for regional food and fiber and also as an industry for the diversified county economy. Goals AG-1 and AG-2 reflect the steps being taken to preserve agricultural lands and resources and improve the viability of agricultural resources throughout the County:

Community Development

The Community Development Element establishes policies for land use designations and boundaries, growth, infrastructure, and services, and sets forth a town design program. Goal CD-4 discusses the need to coordinate planning efforts between local districts, including special districts. Goal CD-5 and policies CD-5.d and e discuss effective growth management as related to transportation, water, sewer, wastewater facilities, and other public services that are relevant to the proposed action.

City of San Rafael General Plan

The City of San Rafael General Plan 2020 provides a united vision of the future of the community with goals to preserve San Rafael's 'hometown' character, improve the appearance of the neighborhoods, sustain the diversity of the local economy, and treasure open spaces. The Land Use, Infrastructure and Open Space Elements contain objectives and policies that are relevant to the Proposed Action. Policy LU-1 of the Land Use Element emphasizes the planning of the circulation system and infrastructure to provide capacity for the total development expected by 2020. Policies I-9 and I-13 of the Infrastructure I-9 encourage the MMWD to develop cost effective strategies for adequate long-term water supplies and encourage additional water recycling at Las Gallinas Valley Sanitary District and the Central Marin Sanitation Agency to investigate recycling and reuse of its treated wastewater. Policy OS-6 discourage utilities in open space areas. Necessary utilities in open space should be located and designed to minimize harm to the area's environmental and visual quality while policy CON-20 encourages water-conserving practices in businesses, homes and institutions and increase the use of recycled water.

City of Novato General Plan

The City of Novato is currently updating its 1996 General Plan. The General Plan 2035 is anticipated to be adopted by the city in early 2018. The General Plan 2035 may be adopted by the time elements of the NBWRA Phase 2 are implemented. However, for purposes of this land use analysis, the 1996 Novato General Plan currently in force, updated through 2014, will be used with the anticipation that the General Plan 2035 will consistently continue the 1996 plan's vision for the city.

The 1996 Novato General Plan is a statement of the community's vision of the future. It is a long-range and comprehensive plan that coordinates all major components of the community's physical development for the next twenty years. The Land Use Element contains objectives, policies, and programs for land use designations, infrastructure and public services, constraints analysis, the City's Sphere of Influence, and inter-jurisdictional coordination. Early public comments in the General Plan Update process created a foundation of goals adopted by the City Council. The goals applicable to the proposed Action are as follows:

> **Goal 1:** Preserve and improve the quality of life in Novato. Conserve and where appropriate restore the natural environment and strive for high quality in the built environment that complements the natural environment.
>
> **Goal 5:** Preserve, protect and enhance the natural setting throughout the community, including creeks, hillsides, ridgelines, woodlands, wildlife, native plants, wetlands and open space.
>
> **Goal 6:** Preserve bay front lands and diked wetlands for agriculture, resource restoration, conservation and recreation.
>
> **Goal 11:** Manage growth by requiring the coordination of development with adequate infrastructure, public facilities, public services and promoting conservation, reuse and recycling strategies while meeting the needs of the community with the limited land available for development.

Petaluma, SVCSD, and SCWA Service Areas

Sonoma County General Plan

The Sonoma County General Plan provides guidance for future growth, development and conservation of resources in a manner that is consistent with the goals and the quality of life described by County residents (County of Sonoma, 2008).

Land Use Element. The Land Use Element establishes policies for guiding land use and development in accordance with planned future growth, including the distribution, location, and extent of land uses and their associated standards of population density and building intensity. The Land Use Element provides goals and

objectives that are relevant to NBWRP Phase 2. Goals LU-1, LU-2, LU-8, and LU-9 focus on accommodating growth in Sonoma County with consideration of environmental constraints, capacities of public services and maintaining agricultural lands.

Agricultural Resources Element. The Agricultural Resources Element establishes policies that protect the stability and productivity of agricultural lands and the agricultural industry in the County. This element provides goals and objectives that are related to the Proposed Action. Goals AR-1, AR-4, AR-8 seek to promote the agricultural industry and facilitate agricultural production. Goal AR-8 has objectives to support the Williamson Act program (Objective AR-8.1) as well as participate with wastewater generators to establish programs for agricultural reuse of treated wastewater (Objective AR-8.2, Policy AR-8f).

Open Space and Resource Conservation Element. The Open Space and Resource Conservation Element provides for the conservation of natural resources including water, forests, soils, rivers, harbors, fisheries, wildlife, minerals, and other natural resources. It supports the county's economic base by promoting the production and use of the county's resources. It guides land use decisions that will contribute to the long term maintenance of resource production. Policy OSRC-7s aims to develop comprehensive programs for preservation and restoration of the San Pablo Bay area and shoreline habitats, including mechanisms for preservation and enhancement such as acquisition, zoning and easements and avoiding activities such as filling, grading or construction that would be detrimental to the biotic resources or historic water retention functions.

Water Resources Element. The Water Resources Element includes policies addressing preservation of both surface and groundwater resources, including water supply and water quality. Goal WR-4 seeks to increase the role of conservation and safe, beneficial reuse in meeting water supply needs of both urban and rural users. Objective WR-4.1 aims to increase the use of recycled water where it meets all applicable regulatory standards and is the appropriate quality and quantity for the intended use. Policy WR-4j is intended to ensure that public wastewater disposal systems are designed to reclaim and reuse recycled water for agriculture, geothermal facilities, landscaping, parks, public facilities, wildlife enhancement and other uses to the extent practicable, provided that the water meets the applicable water quality standards and is supplied in appropriate quantities for the intended uses.

City of Petaluma General Plan

The City of Petaluma General Plan 2025 outlines a vision for Petaluma's long-range physical and economic development and resource conservation.

Water Resources. The Water Resources Chapter of the City of Petaluma General Plan 2025 establishes policies regarding wastewater and the use of recycled water. Goal 8-G-3: Recycled Water of the General Plan seeks to maximize the use of recycled water in Petaluma as a potable water offset to manage water demands, and meet regulatory requirements for wastewater discharge. This goal includes policies to guide City actions such as:

1. providing tertiary recycled water for irrigation of landscape areas to reduce potable water demand (Policy 8-P-9);
2. working with agricultural users to reuse secondary recycled water (Policy 8-P-11);
3. providing an adequate supply of potable water, tertiary recycled water, secondary recycled water, or a combination of these to meet customer needs (Policy 8-P-12); and
4. working to convert existing potable water customers identifies under the City's Recycled Water Master Plan to tertiary recycled water as supply becomes available (Policy 8-P-13).

City of Sonoma General Plan

The City of Sonoma General Plan provides a collective vision of the community and general guidance for growth and development in the City and its Sphere of Influence, including the preservation of balance between

agriculture, open space, business considerations, visitor activities, environmental/recreational/ historical/cultural resources, and residential needs (City of Sonoma, 2006).

Community Development Element. The Community Development Element establishes policies for land use designations and boundaries, growth, infrastructure, and services, and sets forth a town design program. Goals CDE-3 and CDE-6 discuss joint planning efforts with other public agencies in the Sonoma Valley and issues related wastewater treatment use in the Sonoma valley relevant to the Proposed Action.

Environmental Resources Element. The Environmental Resources Element establishes policies for open space, conservation, and recreation. Goals ER-1 through ER-4 discuss supporting community programs that preserve and promote agriculture, habitat areas and significant environmental resources including surface and ground water supplies and quality and to set an example of sustainability by conserving resources and following green practices in City facilities, services, and projects.

American Canyon and Napa SD Service Areas

Napa County General Plan

The Napa County General Plan summarizes County Planning Goals and objectives; and establishes a balance between diverse, and in some cases, conflicting programs. It helps maintain the compatibility of economic and environmental objectives and provides guidance for the allocation of resources and the preservation of important County values. (Napa County GP) The County adopted a General Plan Update in 2008 which guides development through a 20 year period.

Agricultural Preservation and Land Use Element. The Agricultural Preservation and Land Use Element contains goals and policies related to agriculture and agricultural, watershed, and open space lands; urban-centered growth; residential, commercial, industrial, and public-institutional uses; growth management; and interagency cooperation. Goals AG/LU-1 and AG/LU-7 discuss the preservation of existing agricultural land uses and urge the consideration of environmental or climatic changes, and desired social services when siting public facilities and when considering the design of those facilities. Policy AG/LU-115 notes that the County will work cooperatively with the private and non-profit sectors, cities, special districts, and other local, state, and federal agencies to plan for services and public facilities.

Conservation Element. The Conservation Element contains goals and policies related to open space conservation, natural resources, surface and ground water supplies, water quality, climate protection, and sustainable practices for environmental health. Collectively, the goals, policies, and action items of this element ensure that Napa County's abundant natural areas and extraordinarily high biodiversity will be preserved and enhanced, that the County's air, water, and terrestrial habitats will be protected, and that Napa County will do its part to conserve energy and address local contributions to global climate change. Goal CON-10 promotes the responsible use and conservation of water in order to conserve supplies and ensure an adequate supply of water for future generations. Goal CON-13 promotes the development of additional water resources to improve water supply reliability in Napa County, including imported water supplies and recycled water projects. Policy CON-62 notes that the county will support recycled water for irrigation and non-potable uses to offset dependency on groundwater and surface waters and ensure adequate wastewater treatment capacity.

City of American Canyon General Plan

The City of American Canyon General Plan defines the framework by which the physical, economic, and human resources of the City are to be managed and utilized over time. The General Plan illustrates the goals, objectives, policies, and development standards of the City and the expectations and responsibilities of all sectors in meeting these.

Land Use Element. The Land Use Element identifies goals, objectives, and policies in regards to land use within the City and projects a long-term vision for the City as a compact urban area surrounded by agriculture and open space. Policy 1.1.6 promotes the retention and continued production of agricultural lands. Goal 1D seeks to promote continued agricultural production and Policy 1.6.5 prohibits the implementation of infrastructure and other services that are conducive to future subdivision and urban development. Policy 1.31.2 seeks to utilize the City's responsibilities for planning utility extension and annexation to support City and County policies for city/urban-centered development and long term retention of agriculture.

Utilities Element. The Utilities Element identifies goals, objectives, and policies in regards to water, wastewater, and stormwater facilities within the City. Policy 5.2.4 promotes wastewater reclamation as an additional water supply source. Objective 5.4 involves establishing a water management program to promote wastewater reuse. Objective 5.7 involves expanding water treatment, storage and distribution facilities as necessary to meet increasing water demands.

Habitat Conservation Plans

The North Bay initiative plans to develop a wetlands resource management plan for the lower portions of the Napa River, Sonoma Creek, and Petaluma River watershed. This area, known as the San Pablo Bay, encompasses more than 50,000 acres of former baylands and marshes, most of which are now agricultural. Bowker has helped to insure that farmers and other landowners are incorporated fully into resource planning efforts by hosting a series of workshops with local government officials and the general public. This initiative has the potential to increase the overall wetlands resource base in California by more than 10 percent.

Regional planning efforts, such as the North Bay Initiative (North Bay Wetlands Protection Program [NBWPP]) and the U.S. Fish and Wildlife Service's (USFWS) Habitat Goals Process are currently being developed. Funded by grants through the EPA, the NBWPP is a voluntary partnership between the BCDC and local governments to develop a comprehensive wetlands protection plan for the North Bay. The goal of the program is to ensure the protection, enhancement, and restoration of North Bay wetlands, while allowing uses such as agriculture that are consistent with wetland values and functions to continue, and limiting other incompatible uses to upland locations. The Bay faces development pressures and land use changes that could seriously compromise the vast mosaic of wetlands, diked historic baylands, and agricultural lands. Urbanization may eliminate some of the best and last remaining opportunities to increase the abundance and diversity of wildlife through the restoration of diked historic baylands. Population growth, new development, and related infrastructure improvements within the Bay watershed may result in the direct loss of wetlands, riparian habitat, and agricultural lands. The planning efforts of the NBWPP focus on reducing conflict, uncertainty, and delays in the wetlands regulatory process by integrating habitat-based natural resource planning, wetland studies, wetland restoration planning (such as the Habitat Goals Process), and state and federal regulatory requirements with local land use planning and zoning.

The NBWPP will provide participating local governments with technical assistance, resource mapping, and baseline information needed to identify and develop comprehensive wetland protection programs.

APPENDIX 3.7B
Impact Summary by Service Area

This table provides a summary of potential impacts related to land use and agriculture and forestry resources.

POTENTIAL IMPACTS AND SIGNIFICANCE – LAND USE AND AGRICULTURE AND FORESTRY RESOURCES

	Impact by Member Agency Service Areas						
Proposed Action	**MMWD**	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.7.1: Physically Divide an Established Community.							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.7.2: Conflict with Adopted Plans and Policies.							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.7.3: Impact to Farmland.							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.8
Transportation and Traffic

3.8A. Regulatory Framework
3.8B. Impact Summary by Service Area

APPENDIX 3.8A
Regulatory Framework

3.8.2 Regulatory Framework

Federal

No federal laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of NBWRP Phase 2 or alternatives to transportation and traffic.

State

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The project areas include several roadways that fall under Caltrans' jurisdiction (i.e., U.S. 101 and SR 37 in Novato; SR 12, SR 116, and SR 121 in Sonoma; and SR 29, SR 121, and SR 221 in Napa).

Caltrans' construction practices require temporary traffic control planning during any time the normal function of a roadway is suspended (Caltrans, 2015). In addition, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance. Caltrans regulations would apply to construction of the pipeline within and immediately adjacent to roadways, as well as the transportation of construction crews and construction equipment throughout the project area (Caltrans, 2017).

Local

This section lists the goals and policies in the general plans for the cities and counties in the project area that could apply to traffic and transportation and the proposed project.

Novato SD

City of Novato

The City of Novato General Plan Mobility Element promotes alternative modes of transportation, roadway improvements, and traffic improvements throughout the planning area (City of Novato, 2016). As the General Plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to the proposed project.

Chapter XV (15-2) of the City of Novato Municipal Code details the City's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to the proposed project, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (City of Novato, 2017). The municipal code applies to all roads within the City's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

SVCSD

City of Sonoma

The City of Sonoma General Plan Circulation Element promotes alternative modes of transportation, roadway improvements, and traffic improvements throughout the planning area (City of Sonoma, 2006). As the General Plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to the proposed project.

Chapter 12.20 of the City of Sonoma Municipal Code details the City's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to the proposed project, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (City of Sonoma, 2017). The municipal code applies to all roads within the City's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

Unincorporated Sonoma County

There are roads in the NBWRP Phase 2 area that are under the jurisdiction of Sonoma County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Sonoma County General Plan Circulation and Transit Element (Sonoma County, 2016). The majority of these goals and policy guidelines in the Circulation and Transit Element pertain to the development and planning of roadways and transit systems and therefore are not relevant to the proposed project.

The Comprehensive Transportation Plan (Moving Forward 2040) for Sonoma County provides further guidance for transportation planning and associated goals and policies (SCTA, 2016). This plan focuses on the design and implementation of improvements to the county circulation system, including roadways, bikeways, and rail service. Therefore, the plan does not include policies relevant to NBWRP Phase 2.

MMWD

City of San Rafael

The City of San Rafael General Plan Circulation Element promotes alternative modes of transportation, roadway improvements, and traffic improvements throughout the planning area (City of Sonoma, 2006). As the General Plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to the proposed project.

Chapter 11.04 of the City of San Rafael Municipal Code details the City's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to NBWRP Phase 2, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (City of San Rafael, 2017). The municipal code applies to all roads within the City's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

Unincorporated Marin County

Some of the roads in the NBWRP Phase 2 area are under the jurisdiction of Marin County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the *Marin County Countywide Plan,* The Built Environment (Transportation) Element (Marin County, 2014). The majority of these goals and policy guidelines in The Built Environment (Transportation) Element pertain to the development and planning of roadways and transit systems and therefore are not relevant to NBWRP Phase 2.

Chapter 13.12 of the Marin County Municipal Code details the County's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to NBWRP Phase 2, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (Marin County, 2017). The municipal code applies to all roads within the County's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

Napa SD

Unincorporated Napa County

Soscol Ferry Road is under the jurisdiction of Napa County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Napa County General Plan Circulation Element (Napa County, 2013). The majority of these goals and policy guidelines in the Circulation Element pertain to the development and planning of roadways and transit systems and, therefore, are not relevant to NBWRP Phase 2.

Chapter 12.04 of the Napa County Municipal Code details the County's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to NBWRP Phase 2, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (Napa County, 2017). The municipal code applies to all roads within the County's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

Petaluma

City of Petaluma

The City of Petaluma General Plan Mobility Element promotes alternative modes of transportation, roadway improvements, and traffic improvements throughout the planning area (City of Petaluma, 2012). As the General Plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to NBWRP Phase 2.

Chapter 13.04 of the City of Petaluma Municipal Code details the City's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to NBWRP Phase 2, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (City of Petaluma, 2017). The municipal code applies to all roads within the City's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

Unincorporated Sonoma County

There are roads in the NBWRP Phase 2 area are under the jurisdiction of Sonoma County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Sonoma County General Plan Circulation and Transit Element (Sonoma County, 2016). The majority of these goals and policy guidelines in the Circulation and Transit Element pertain to the development and planning of roadways and transit systems and therefore are not relevant to NBWRP Phase 2.

The Comprehensive Transportation Plan (Moving Forward 2040) for Sonoma County provides further guidance for transportation planning and associated goals and policies (SCTA, 2016). This plan focuses on the design and implementation of improvements to the county circulation system, including roadways, bikeways, and rail service. Therefore, the plan does not include policies relevant to NBWRP Phase 2.

American Canyon

City of American Canyon

The City of American Canyon General Plan Circulation Element promotes alternative modes of transportation, roadway improvements, and traffic improvements throughout the planning area (City of Petaluma, 2017). As the General Plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to NBWRP Phase 2.

Unincorporated Napa County

There are roads in the project corridor are under the jurisdiction of Napa County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Napa County General Plan Circulation Element (Napa County, 2013). The majority of these goals and policy guidelines in the Circulation Element pertain to the development and planning of roadways and transit systems and therefore are not relevant to NBWRP Phase 2.

Chapter 12.04 of the Napa County Municipal Code details the County's regulations regarding the use of roads and the construction of utilities infrastructure, including encroachments. Numerous regulations are applicable to NBWRP Phase 2, including regulations regarding the use of roadways, the type of vehicles and load sizes allowable on given roadways, encroachment on private property, and the construction of utilities infrastructure (Napa County, 2017). The municipal code applies to all roads within the County's jurisdiction, and project construction must adhere to all ministerial regulations presented in the Municipal Code.

APPENDIX 3.8B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to transportation and traffic.

POTENTIAL IMPACTS AND SIGNIFICANCE – TRANSPORTATION AND TRAFFIC

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.8.1: Construction of the Program projects would have temporary and intermittent effects on traffic and transportation conditions in the project area.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.8.2: Construction of the Program projects would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers).							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.8.3: Construction of the Program projects would have temporary effects on alternative transportation or alternative transportation facilities.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.8.4: Construction of the Program projects would temporarily increase the potential for accidents on project roadways.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.8.5: Construction of the Program projects would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.9
Air Quality

3.9A. Setting and Regulatory Framework
3.9B. Impact Summary by Service Area
3.9C. Construction Criteria Pollutant Exhaust Emissions
3.9D. NBWRP Phase 2 San Francisco Bay Area Air Basin, Summer
3.9E. NBWRP Phase 2 San Francisco Bay Area Air Basin, Annual

APPENDIX 3.9A
Setting and Regulatory Framework

3.9.1 Affected Environment

Local Climatology, Air Quality, and Sensitive Receptors

Novato SD and MMWD

Climate. The Novato SD and MMWD service areas are located in the Marin County Basin subregion of the Air Basin. The climate varies throughout this subregion depending on proximity to the Pacific Ocean and San Pablo and San Francisco bays (referred collectively here as the Bay). It is mainly characterized by warm dry summers and cool moist winters. The Bay and the Pacific Ocean have a moderating influence on the climate, especially near the coast. There is a high percentage of sunshine away from the coast, particularly in summer. Movements of marine air, which in large part determine the temperature, humidity, wind, and precipitation throughout the year, depend upon the location and strength of the dominant Pacific high-pressure system and the coastal temperature gradient. Coastal temperatures in degrees Fahrenheit are usually in the low 60's in the summer and the high 50's in the winter, while the inland areas average maximum summer temperatures in the low 80's and average minimum winter temperatures in the low 40's (BAAQMD, 2017a).

Air Quality. Air pollution potential is highest on the eastern side of Marin County, which has semi-sheltered valleys and the largest population centers. Currently, most of the development lies along the Bay, particularly in southern Marin County. In the south, the developed areas lie closer to the ocean; therefore, the influence of the marine air keeps the pollution levels low. As the developed areas extend further north where the valleys are more sheltered from the sea breeze, the potential for pollution increases (BAAQMD, 2017a).

The BAAQMD air quality monitoring station closest to and most representative of air quality conditions in the Novato SD and MMWD service areas is located in the City of San Rafael within the MMWD service area. This station monitors O_3, PM_{10}, $PM_{2.5}$, and NO_2. **Table 3.9-1** provides the most recent air pollutant concentrations representative of the Novato SD and MWWD service areas and applicable state and federal ambient air quality standards.

Sensitive Receptors. Sensitive receptors near the pipeline alignments and the RWF Treatment Capacity Expansion site proposed by Novato SD consist of single-family residences. The WWTP site where the RWF Treatment Capacity Expansion site is located is approximately 550 feet from residences along Lea Drive. The Option 1: Site Near Highway 37 (Tertiary) 150 AF site is not in the vicinity of sensitive receptors. The MMWD's proposed treatment facilities at the CMSA plant would be approximately 900 feet from the closest living quarters at San Quentin Prison.

SVCSD

Climate. The SVCSD service area is located in the Sonoma Valley subregion of the Air Basin. In Sonoma Valley, the strongest up-valley winds occur in the afternoon during the summer and the strongest down-valley winds occur during clear, calm winter nights. Prevailing winds follow the axis of the valley, northwest/southeast, while some upslope flow during the day and down-slope flow during the night occurs near the base of the mountains. Summer average maximum temperatures measured in degrees Fahrenheit are usually in the high 80's, and

APPENDIX 3.9B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to air quality.

POTENTIAL CEQA IMPACTS AND SIGNIFICANCE – AIR QUALITY

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.9.1: Construction of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could exceed air quality standards or contribute substantially to an existing or projected air quality violation.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NAE	NINAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	SU	SU	SU	(a)	(a)	SU
Impact 3.9.2: Operations of the NBWRP Phase 2 projects would result in criteria pollutant emissions that could contribute to an existing or projected air quality violation.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.9.3: Construction of the NBWRP Phase 2 projects would result in emissions that could conflict with the 2017 Clean Air Plan.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	SU	SU	SU	(a)	(a)	SU
Impact 3.9.4: Construction of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI//NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LSM	LS	LS	(a)	(a)	LSM
Impact 3.9.5: Operation of the NBWRP Phase 2 could expose sensitive receptors to toxic air contaminants, including diesel particulate matter emissions.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
NAE = No Adverse Effect
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation
SU= Significant and Unavoidable impact

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

TABLE 3.9-1: AIR POLLUTANT SUMMARY FOR NOVATO SD AND MMWD SERVICE AREAS

Pollutant	Standard	2012	2013	2014	2015	2016
Ozone (O_3)						
Highest 1-hr average, ppm		0.076	0.081	0.088	0.081	0.088
Number of State standard exceedance days	0.09	0	0	0	0	0
Highest 8-hr average, ppm		0.57	0.069	0.068	0.070	0.067
Number of federal standard exceedance days	0.070	0	0	0	0	0
Respirable Particulate Matter-10 Micron (PM_{10})						
Highest 24-hr average, µg/m^3		37.1	54.4	40.9	42.0	27.0
Estimated State standard exceedance days	50	0	6	0	0	0
Estimated federal standard exceedance days	150	0	0	0	0	0
State Annual Average, µg/m^3	20	13.3	15.6	14.1	16.1	13.6
Exceedance?		No	No	No	No	No
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)						
Highest 24-hr average, µg/m^3		26.5	44.9	38.1	36.3	15.6
Estimated federal standard exceedance days	35	0	2	1	2	0
Federal Annual Average, µg/m^3	12.0	8.0	10.7	10.7	8.7	6.5
Exceedance?		No	No	No	No	No
Nitrogen Dioxide (NO_2)						
Highest 1-hr average, ppm		0.052	0.050	0.062	0.044	0.046
Number of State standard exceedance days, ppm	0.18	0	0	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0	0	0
State Annual Average, ppm	0.030	0.011	0.012	0.011	0.010	0.009
Exceedance?		No	No	No	No	No

NOTES: Underlined values indicate an excess of applicable standard. Data are from 4th Street Monitoring Station in San Rafael, California. ppm – parts per million; µg/m^3 – micrograms per cubic meter.

SOURCE: CARB, 2017.

summer minimums are around 50. Winter maximums are in the high 50's to the mid 60's, with minimums ranging from the mid-30s to low 40s (BAAQMD, 2017a).

Air Quality. The BAAQMD air quality monitoring station on Jefferson Avenue in Napa, located approximately seven miles to the east of the SVCSD service area, is closest and most representative of air quality conditions in the area. The station monitors O_3, PM_{10}, $PM_{2.5}$, and NO_2. The most recent data available from this monitoring station are shown in **Table 3.9-2** with applicable state and federal air quality standards.

Sensitive Receptors. Sensitive receptors in the vicinity of the SVCSD Napa Road Pipeline and the SCWA pipeline to the Valley of the Moon ASR alignments include many single-family residences along Napa Road. The Valley of the Moon ASR Pump Station and monitoring wells site is approximately 100 feet from the nearest residence and the Sonoma ASR Pump Station and monitoring well site is approximately 150 feet from the nearest residence.

City of Petaluma

Climate. The City of Petaluma service area is located in the Cotati and Petaluma Valleys subregion of the Air Basin. The subregion stretches from Santa Rosa to the San Pablo Bay. To the east, the valley is bordered by the Sonoma Mountains, while to the west is a series of low hills, followed by the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay is known as the Petaluma Gap. This low-terrain area allows marine air to travel into the Air Basin.

TABLE 3.9-2: AIR POLLUTANT SUMMARY FOR THE AMERICAN CANYON, NAPA SD, AND SVCSD SERVICE AREAS

Pollutant	Standard	2012	2013	2014	2015	2016
Ozone (O_3)						
Highest 1-hr average, ppm		0.082	0.089	0.074	0.079	0.080
Number of State standard exceedance days	0.09	0	0	0	0	0
Highest 8-hr average, ppm		0.064	0.076	0.066	0.069	0.067
Number of State standard exceedance days	0.070	0	2	0	0	0
Number of federal standard exceedance days	0.070	0	1	0	0	0
Respirable Particulate Matter-10 Micron (PM_{10})						
Highest 24-hr average, µg/m^3		37.7	39.6	39.3	50.0	33.0
Estimated State standard exceedance days	50	0	0	0	0	0
Estimated federal standard exceedance days	150	0	0	0	0	0
State Annual Average, µg/m^3	20	16.1	18.7	15.8	18.7	*
Exceedance?		No	No	No	No	*
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)						
Highest 24-hr average, µg/m^3		24.2	35.8	29.9	38.2	24.3
Estimated federal standard exceedance days	35	*	1	0	1	0
Federal Annual Average, µg/m^3	12.0	*	11.7	11.9	10.7	8.6
Exceedance?		*	No	No	No	No
Nitrogen Dioxide (NO_2)						
Highest 1-hr average, ppm		0.050	0.043	0.046	0.043	0.039
Number of State standard exceedance days, ppm	0.18	0	0	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0	0	0
State Annual Average, ppm	0.030	0.007	0.009	0.007	0.007	0.007
Exceedance?		0	0	0	0	0

NOTES: Underlined values indicate an excess of the applicable standard. Data are from Jefferson Avenue Monitoring Station in Napa, California. ppm – parts per million; µg/m^3 – micrograms per cubic meter. * Indicates there was insufficient data available to determine the value.

SOURCE: CARB, 2017.

Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds flowing predominantly from the west. As marine air travels through the Petaluma Gap, it splits into northward and southward paths moving into the Cotati and Petaluma valleys. When the ocean breeze is weak, strong winds from the east can predominate, carrying pollutants from the Central Valley and the Carquinez Strait. During these periods, up-valley flows can carry the polluted air as far north as Santa Rosa. Winds are usually stronger in the Petaluma Valley than the Cotati Valley because the former is directly in line with the Petaluma Gap. Petaluma's climate is similar to areas closer to the coast even though Petaluma is 28 miles from the ocean. Average annual wind speed at the Petaluma Airport is 7 miles per hour (mph). Summer maximum temperatures for Petaluma in degrees Fahrenheit are in the low-to-mid-80's, while winter maximum temperatures are in the high-50's to low-60's. Summer minimum temperatures are around 50 degrees, and winter minimum temperatures are in the high 30's.

Air Quality. Generally, air pollution potential is low in Petaluma Valley because of its link to the Petaluma Gap and because of its low population density. There are two scenarios that could produce elevated pollutant levels: 1) stagnant conditions in the morning hours created when a weak ocean breeze meets a weak bay breeze, and 2) an eastern or southeastern wind pattern in the afternoon that can bring in pollution from the Carquinez Strait Region and the Central Valley (BAAQMD, 2017a).

The BAAQMD air quality monitoring station on Morris Street in Sebastopol, located approximately 13 miles northwest of the City of Petaluma service area, is closest to and most representative of air quality conditions in the area. The station monitors O_3, $PM_{2.5}$, and NO_2. The most recent data available from this monitoring station

are shown in **Table 3.9-3** (no data are available for 2012 or 2013) with applicable state and federal air quality standards.

TABLE 3.9-3: AIR POLLUTANT SUMMARY FOR CITY OF PETALUMA SERVICE AREA

Pollutant	Standard	2014	2015	2016
Ozone (O_3)				
Highest 1-hr average, ppm		0.067	0.068	0.073
Number of State standard exceedance days	0.09	0	0	0
Highest 8-hr average, ppm		0.061	0.062	0.064
Number of federal standard exceedance days	0.070	0	0	0
Fine Particulate Matter-2.5 Micron ($PM_{2.5}$)				
Highest 24-hr average, µg/m^3		26.2	29.9	18.7
Estimated federal standard exceedance days	35	0	0	0
Federal Annual Average, µg/m^3	12.0	7.7	6.8	4.9
Exceedance?		No	No	No
Nitrogen Dioxide (NO_2)				
Highest 1-hr average, ppm		0.044	0.037	0.032
Number of State standard exceedance days, ppm	0.18	0	0	0
Number of federal standard exceedance days, ppb	100	0	0	0
State Annual Average, ppm	0.030	0.004	0.004	0.004
Exceedance?		No	No	No

NOTES: Data are from Morris Street Station in Sebastopol; ppm – parts per million; µg/m^3 – micrograms per cubic meter.

SOURCE: CARB, 2017.

Sensitive Receptors. Sensitive receptors in the vicinity of the proposed pipeline alignments within the City of Petaluma service area include many single- and multi-family residences, Bernard Eldredge Elementary School, Meadow Elementary School, Kenilworth Junior High School, McKinley Elementary School, Miwok Valley Elementary School, La Tercera Elementary School, Old Adobe Union School Kid Care, and River Montessori Charter School. There are also several residences across the street from the Ellis Creek Water Recycling Facility on the north side of Lakeville Highway, the closest of which would be approximately 450 feet from the Increase Ellis Creek Water Recycling Facility (WRF) Capacity Project site.

Napa SD and City of American Canyon

Climate. The Napa SD and City of American Canyon service areas are located within the Napa Valley subregion of the Air Basin. Up-valley winds frequently develop during warm summer afternoons drawing from the air flowing through San Pablo Bay. Down-valley winds develop during evenings in the winter. The average maximum temperatures measured in degrees Fahrenheit in summer are in the low 80's at the southern end of the valley and in the low 90's at the northern end with minimum temperatures in the low 50's. The average maximum temperatures in winter are in the high 50's with minimum temperatures in the high to mid-30's. Winter extreme low temperatures range from the high 20's to the mid-20's.

Air Quality. The potential for air pollution in the valley is high. Summer and fall prevailing winds can transport non-local and locally generated ozone precursors northward where the valley narrows, effectively trapping and concentrating the pollutants under stable conditions. The local upslope and down-slope flows setup by the surrounding mountains may also re-circulate pollutants adding to the total burden. Also, the high frequency of light winds and associated stable conditions during the late fall and winter, contribute to the buildup of particulates and CO from automobiles, agricultural burning, and fireplace burning (BAAQMD, 2017a).

The BAAQMD air quality monitoring station on Jefferson Avenue in Napa, located within the Napa SD service area and within six miles of the City of American Canyon service area, is the closest to and most representative of air quality conditions at these service areas. The station monitors O_3, PM_{10}, $PM_{2.5}$, and NO_2. **Table 3.9-2** presents the most recent data available from this monitoring station and compares the pollutants to applicable state and federal air quality standards.

Sensitive Receptors. One of the American Canyon Recycled Water Distribution System Expansion 1 pipelines would pass just north of Napa Junction Elementary School, and a pipeline segment would pass adjacent to a daycare facility, single-family residences, a senior care facility, and American Canyon Middle School. There are several residences approximately 600 feet from the Napa State Hospital Storage Tank project site, but no sensitive receptors in the vicinity of the proposed Soscol WRF Increased Filter Capacity project.

Air Pollutants of Concern

Regulation of air pollution is achieved through both national and State ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the United States Environmental Protection Agency (USEPA) has identified criteria pollutants and has established national ambient air quality standards (NAAQS) to protect public health and welfare. The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. The USEPA has established the NAAQS for O_3, CO, NO_2, SO_2, particulate matter (i.e., PM_{10}, $PM_{2.5}$), and lead. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient thresholds for all criteria pollutants. Primary thresholds are set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards are set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

California has adopted more stringent ambient air quality standards (i.e., California Ambient Air Quality Standards [CAAQS]) for most of the criteria air pollutants. **Table 3.9-1** presents the national and state ambient air quality standards and associated attainment status for each pollutant. California has also established state ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected to occur under the Program; therefore, are not discussed further in the section.

3.9.2 Regulatory Framework

Federal

Clean Air Act

The federal CAA is a comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the USEPA to establish NAAQS to protect public health and the environment. The CAA specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas that do not meet the standards. The SIPs must include pollution control measures that demonstrate how the standards would be met. Under amendments to the federal CAA, USEPA has classified air basins or portions thereof as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the national standards have been achieved.

TABLE 3.9-1
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Attainment Status for California Standard	Federal Primary Standard	Attainment Status for Federal Standard
Ozone	8 Hour	0.070 ppm	Non-Attainment	0.070 ppm	Non-Attainment - Marginal
	1 Hour	0.09 ppm	Non-Attainment	---	---
Carbon Monoxide	8 Hour	9.0 ppm	Attainment	9 ppm	Attainment
	1 Hour	20 ppm	Attainment	35 ppm	Attainment
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment
	1 Hour	0.18 ppm	Attainment	0.100 ppm	Unclassified
Sulfur Dioxide	Annual Average	---	---	0.030 ppm	Attainment
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 $\mu g/m^3$	Non-Attainment	---	---
	24 Hour	50 $\mu g/m^3$	Non-Attainment	150 $\mu g/m^3$	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 $\mu g/m^3$	Non-Attainment	12.0 $\mu g/m^3$	Unclassified/Attainment
	24 Hour	---	---	35 $\mu g/m^3$	Non-Attainment - Moderate
Sulfates	24 Hour	25 $\mu g/m^3$	Attainment	---	---
Lead	Calendar Quarter	---	---	1.5 $\mu g/m^3$	Attainment
	30-Day Average	1.5 $\mu g/m^3$	Attainment	---	---
	3-Month Rolling Average	---	---	0.15 $\mu g/m^3$	Unclassified
Hydrogen Sulfide	1 Hour	0.03 ppm	Unclassified	No Federal Standard	---
Vinyl Chloride	24 Hour	0.010 ppm	No information available	---	---
Visibility Reducing Particles	8 Hour	Extinction of 0.23/km; visibility of 10 miles or more	Unclassified	No Federal Standard	---

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

SOURCE: BAAQMD, 2017b.

Federal Conformity Requirements

Federal projects are subject to either the Transportation Conformity Rule (40 Code of Federal Regulations [CFR], Part 51, Subpart T), which applies to federal highway and transit projects, or the General Conformity Rule (40 CFR, Part 51, Subpart W), which applies to all other federal projects. Because the proposed Program is not a federal highway or transit project, it is subject to the General Conformity Rule.

The purpose of the General Conformity Rule is to ensure that federal projects conform to applicable SIPs so that they do not interfere with strategies employed to attain the NAAQS. The rule applies to federal projects in nonattainment areas for any of the criteria pollutants for which the USEPA has established these national standards and in areas designated as "maintenance" areas. The rule covers direct and indirect emissions of

criteria pollutants or their precursors that result from a federal project, that are reasonably foreseeable, and that can be practicably controlled by the federal agency through its continuing program responsibility. The rule applies to all federal projects, including project approvals and funding, except:

1. Projects specifically included in a transportation plan or program that is found to conform under the federal transportation conformity rule;
2. Projects with associated emissions below specified "de minimis" threshold levels (i.e., levels beyond which an air quality effect is considered significant); or
3. Certain other projects that are exempt or presumed to conform.

Sources that are exempt include those that require a permit under the New Source Review or Prevention of Significant Deterioration program. Projects presumed to conform are those that are presumed to result in insignificant quantities of emissions, including routine maintenance and repair, routine operations, and prescribed burning. The proposed Program does not fall under the exempt categories and would be subject to the General Conformity Rule.

Class 1 Areas

The federal CAA of 1977 set a long-term goal of improving visibility by 2064 to achieve natural conditions in selected national parks and wilderness areas of the United States, known as Class 1 Areas. California has 29 mandatory Class 1 Areas managed by either the National Parks Service or the U.S. Forest Service. The closest Class I Area is the Point Reyes Wilderness Area, located along the Marin County coast, at a distance of approximately 10 miles (16 kilometers (km)) from the Program area. There are no other Class I Areas within 62 miles (100 km) of the Program Area (USEPA, 2011).

In 1999, the USEPA promulgated a regional haze regulation that calls for states to establish goals and emission reduction strategies to make initial improvements in visibility at their respective Class 1 Areas. The USEPA funded five Regional Planning Organizations throughout the country to coordinate regional haze rule-related activities between states in each region. California belongs to the Western Regional Air Partnership (WRAP), the consensus organization of western states, tribes, and federal agencies, which oversees analyses of monitoring data and preparation of technical reports regarding regional haze in the western United States.

State

The California Air Resources Board (CARB) is responsible for establishing and reviewing the State standards, compiling the California SIP and securing approval of the plan from the USEPA, conducting research and planning, and identifying TACs. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts, such as the BAAQMD, are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal and California CAAs.

Local

Bay Area Air Quality Management District

The Program area is within the jurisdiction of the BAAQMD, which is the local agency delegated responsibility for preparing, adopting, and implementing stationary and area air emission control measures and standards.

BAAQMD Air Quality Plans

The 1977 CAA amendments require regional planning and air pollution control agencies to prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the CAA. The California CAA also requires development of air quality plans and strategies to meet state air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the state particulate matter standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. (As indicated above, air quality plans developed to meet federal requirements are referred to as SIPs.)

For state air quality planning purposes, the Air Basin is classified as a serious non-attainment area for the 1-hour ozone standard. The "serious" classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the BAAQMD update its Clean Air Plan every 3 years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The BAAQMD's record of progress in implementing previous measures must also be reviewed. The most recently adopted air quality plan to address nonattainment issues for the Air Basin is titled *Spare the Air, Cool the Climate, A Blueprint for Clean Air and Climate Protection in the Bay Area, Final 2017 Clean Air Plan* (2017 Clean Air Plan; BAAQMD, 2017c). The 2017 Clean Air Plan provides a regional strategy to protect public health and protect the climate by continuing progress toward attaining all state and federal air quality standards; eliminating health risk disparities from exposure to air pollution among Bay Area communities; transitioning the region to a post-carbon economy needed to achieve GHG reduction targets for 2030 and 2050; and providing a regional climate protection strategy that will put the Bay Area on a pathway to help achieve those GHG reduction targets. The 2017 Clean Air Plan includes a wide range of 85 control measures designed to decrease emissions of the air pollutants that are most harmful to residents, such as particulate matter, ozone, and TACs; to reduce emissions of methane and other "super-GHGs" that are potent climate pollutants in the near-term; and to decrease emissions of CO by reducing fossil fuel combustion (BAAQMD, 2017c).

Regulation 9-8-330

This rule limits the emissions of NO_x and CO from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower. It stipulates that a person may only operate an emergency standby engine for reliability-related activities so long as total hours of operation for this purpose do not exceed 50 hours in a calendar year, or limitations contained in a BAAQMD permit, whichever is lower.

Local General Plans

This section lists the goals and policies in the general plans for the cities and counties in the project area that apply to air quality and would be applicable to the Program.

LGVSD

City of San Rafael General Plan

The Air and Water Quality Elements of the City of San Rafael 2020 General Plan include policies to help San Rafael meet all ambient air quality standards. Policies that may be applicable to the Program include the following (City of San Rafael, 2016):

> ***Policy AW-2b: Buffers.*** Through development review, ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with existing health standards.

Policy AQ-4a: Pollution Reduction. Through development review, ensure that any proposed new sources of particulate matter use latest control technology (such as enclosures, paving unpaved areas, parking lot sweeping and landscaping) and provide adequate buffer setbacks to protect existing or future sensitive receptors.

Marin Countywide Plan

Policies regarding air quality are contained within the Natural Systems and Agricultural Element of the Marin Countywide Plan. Policies and implementation programs that may be applicable to the Program include the following (Marin County, 2007):

Goal AIR-1: Improved Regional Air Quality. Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.

Policy AIR-1.3: Require Mitigation of Air Quality Impacts. Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.

Implementation program AIR-4h: Evaluate the Carbon Emissions Impacts of Proposed Developments. Incorporate a carbon emissions assessment into land use plans and the environmental impact report for proposed actions.

Novato SD

City of Novato General Plan

The Environment Legacy Chapter of the City of Novato General Plan 2035 includes policies to regulate emissions of air pollutants. Programs included in the City of Novato General Plan 2035 that may be applicable to the proposed action include the following (City of Novato, 2016):

EL 17a: Clean Air Plan. Cooperate with the Bay Area Air Quality Management District in implementing the regional Clean Air Plan.

SVCSD

City of Sonoma General Plan

The Environmental Resources Element of the City of Sonoma's 2020 General Plan includes the following policy and implementation measure that may be applicable to the Program (City of Sonoma, 2006):

***Policy 2.9*:** Require development to avoid potential impacts to wildlife habitat, air quality, and other significant biological resources, or to adequately mitigate such impacts if avoidance is not feasible.

***Implementation Measure 2.9.1*:** Evaluate applications for new developments in terms of their potential to expose sensitive uses to substantial air pollutant concentrations and/or to create or emit objectionable odors.

Sonoma County General Plan

The Sonoma County General Plan's Resource Conservation Element includes goals and policies regarding the protection and enhancement of air quality in the region. The county's goal in maintaining air quality is to "Preserve and maintain good air quality and provide for an air quality standard that will protect human health and preclude crop, plant, and property damage in accordance with the requirement of the federal and state Clean Air Acts" (Sonoma County, 2008). The General Plan Resource Conservation Element contains the following objective that would generally be applicable to the Program:

> ***Objective RC-13.1*:** Maintain the projected county air quality as set forth in the Final Environmental Impact Report [for the General Plan EIR] and minimize air pollution.

Napa SD

City of Napa General Plan

The City of Napa General Plan's Natural Resources chapter contains a number of policies to help maintain acceptable levels of air quality in the City of Napa. The following policy may be applicable to the proposed action (City of Napa, 1998):

> ***Policy NR-5.4*:** The City shall, during discretionary review, require that development proposals comply with federal and state air quality standards, or make findings that the project has overriding benefits to the community that outweigh nonattainment of the standards.

Napa County General Plan

The Conservation and Open Space Element of the Napa County General Plan contains policies to protect and enhance air quality in the County. The policies outlined in this plan focus primarily on discouraging scattered development and preventing the filling of river areas, salt ponds, wetlands, and marsh areas (Napa County, 2008).

City of Petaluma

City of Petaluma General Plan

The Natural Environment Chapter in the City of Petaluma's General Plan contains goals and policies to help improve air quality. The following goal and policy may be applicable to the Program (City of Petaluma, 2008).

> **Goal 4-G-3: Air Quality.** Improve air quality and meet all Federal and State ambient air quality standards and goals by reducing the generation of air pollutants from stationary and mobile sources.
>
> ***Policy 4-P-16:*** To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts of the following requirements or measures shown to be equally effective.
>
> 1. Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;
> 2. Minimize idling time of construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;
> 3. Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline);
> 4. Use add-on control devices such as diesel oxidation catalysts or particulate filters;
> 5. Use diesel equipment that meets the ARB's 2000 or newer certification standard for offroad heavy-duty diesel engines;
> 6. Phase construction of the project;
> 7. Limit the hours of operation of heavy duty equipment.

APPENDIX 3.9C

Construction Criteria Pollutant Exhaust Emissions

3.9.1 ESTIMATED CONSTRUCTION PHASING

Program Phasing Schedule as Presented in Feasibility Report

Project Schedule by MA for Phase 2 Program								
Agency	Project Type	Project Title	Year					
			2018	2019	2020	2021	2022	2023
Novato SD	Treatment	Novato SD WRP Capacity - 1st Expansion (+0.85 MGD)					■	■
	Environmental Enhancement	Marin County Lower Novato Creek Project - Distribution					■	
		Turnout to Transitional Wetlands			■	■		
SVCSD	Distribution	Napa Road Pipeline			■	■		
SCWA	Seasonal Storage	Valley of the Moon ASR		■	■			
		Sonoma ASR			■	■		
City of Petaluma	Treatment	Increase ECWRF Capacity	■	■				
	Distribution	Urban Recycled Water Expansion	■	■	■	■	■	■
		Agricultural Recycled Water Expansion Phase 1		■	■			
		Agricultural Recycled Water Expansion Phase 2				■	■	
Napa SD	Treatment	Soscol WRF Increased Filter Capacity	■	■				
	Operational Storage	Additional Soscol WRF Covered Storage		■	■			
MMWD/ CMSA	Distribution	Recycled Water Distribution System Expansion to San Quentin Prison			■	■		
City of American Canyo	Distribution	Phase 1 Recycled Water Distribution System Expansion	■	■				
		Phase 2 Recycled Water Distribution System Expansion		■	■			
	Treatment	AmCam WRF Phase 2 Treatment Plant Upgrades				■	■	

3.9.2 PROGRAM PHASING SCHEULE FOR CALEEMOD INPUT

PhaseName	PhaseStartDate	PhaseEndDate	NumDaysWeek	NumDays
Increase Soscol WRF Filter Capacity	2018/10/26	2019/04/19	5	126
Recycled Water Distribution System Expansion – Phase 1	2018/12/03	2019/04/09	5	92
Increase ECWRF Capacity	2019/04/20	2019/10/14	5	126
Urban Recycled Water Expansion	2019/10/15	2021/05/27	5	423
Agricultural Recycled Water Expansion – Phases 1 and 2	2019/11/11	2020/07/13	5	176
Recycled Water Distribution System Expansion – Phase 2	2019/12/02	2020/04/24	5	105
Soscol WRF Covered Storage	2019/12/30	2020/08/19	5	168
Turnout to Wetlands	2020/01/06	2020/01/17	5	10
Napa Road Pipeline	2020/01/06	2020/06/12	5	115
Recycled Water Distribution System Expansion to San Quentin Prison	2020/01/06	2020/06/29	5	126
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	2020/01/06	2020/01/20	5	11
Soscol WRF Covered Storage - Pipeline	2020/01/06	2020/01/13	5	6
Marin County Lower Novato Creek - Distribution	2021/05/28	2021/08/17	5	58
WRF Phase 2 Treatment Plant Upgrades	2021/11/01	2022/04/25	5	126
WRF Phase 2 Treatment Plant Upgrades - Pipelines	2021/11/01	2021/11/15	5	11
RWTF Treatment Capacity Expansion	2022/02/07	2022/06/02	5	84

3.9.3 CONSTRUCTION WORKER AUTO AND TRUCK TRIPS

Total Trips per Phase 2 Projects

Program Phase 2 Projects	Workdays	workers	Daily one-way worker trips	Total one-way worker trips	Daily one-way truck trips	Total one-way truck trips
RWTF Treatment Capacity Expansion	84	9	18	1,512	2	168
Marin County Lower Novato Creek - Distribution	58	12	24	1,392	3	154
Turnout to Wetlands	10	12	24	240	18	174
Napa Road Pipeline	115	12	24	2,760	5	534
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	126	9	18	2,268	2	252
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	58	12	24	1,392	3	154
Increase Soscol WRF Filter Capacity	84	9	18	1,512	2	168
Soscol WRF Covered Storage	168	15	30	5,040	1	101
Soscol WRF Covered Storage - Pipeline	6	12	24	144	6	34
Increase ECWRF Capacity	126	9	18	2,268	2	252
Urban Recycled Water Expansion	423	12	24	10,152	5	1,964
Agricultural Recycled Water Expansion – Phases 1 and 2	176	12	24	4,224	7	1,180
Recycled Water Distribution System Expansion – Phase 1	92	12	24	2,208	4	353
Recycled Water Distribution System Expansion – Phase 2	105	12	24	2,520	5	444
WRF Phase 2 Treatment Plant Upgrades	126	9	18	2,268	2	252
WRF Phase 2 Treatment Plant Upgrades - Pipeline	11	12	24	264	5	49
			Total	40,164	Total	6,232

Notes:

Worker one-way trips are estimated based on the number workdays, multiplied by the number of workers, multiplied by two. 12 workers for pipeline construction, 15 workers for Covered Storage construction (see PD), and 12 workers for other facilities construction.Daily one-way truck trips are rounded up.

See below for assumptions related to the truck one-way trips estimates.

Truck Trips for Pipeline Construction

Program Phase 2 Project with Pipeline Segments	Assumed average diameter (in)[1]	Trench Dimensions			trench volume		Disturbed cy (cut/fill)	One-way export truck trips[3]	One-way import truck trips[4]	Total pipeline truck trips
		feet	inches[2]							
		length	depth	width	cubic feet	cubic yards				
Marin County Lower Novato Creek - Distribution	6	5,780	24	13	12,386	459	917	38	116	154
Turnout to Wetlands	54	100	216	116	17,357	643	1,286	54	100	154
Napa Road Pipeline	12	11,500	48	26	98,571	3,651	7,302	304	230	534
Recycled Water Distribution System Expansion to San Quentin Prison	6	5,800	24	13	12,429	460	921	38	116	154
Soscol WRF Covered Storage	14	600	56	30	7,000	259	519	22	12	34
Urban Recycled Water Expansion	12	42,260	48	26	362,229	13,416	26,832	1,118	846	1,964
Agricultural Recycled Water Expansion – Phases 1 and 2	16	17,600	64	34	268,190	9,933	19,866	828	352	1,180
Recycled Water Distribution System Expansion – Phase 1	10	9,180	40	21	54,643	2,024	4,048	169	184	353
Recycled Water Distribution System Expansion – Phase 2	11	10,530	44	24	75,841	2,809	5,618	234	210	444
WRF Phase 2 Treatment Plant Upgrades	12	1,056	48	26	9,051	335	670	28	21	49
Notes:									Total	5,020

[1] Based on diameters presented in EIR Section 2.7.1

[2] Depth and width estimated by rough scaling; based on 30 in width and 56 in depth for 14-inch pipeline.

[3] Export trips assume truck capacity of 8 cy/ round trip, and that 1/3 of trench spoils would be hauled offsite.

[4] Pipe and material deliveries (2 one-way trips/day except for 54 in pipe, which would require 10 one-way trips/day.

Truck Trips for Non-Pipeline Construction

Program Phase 2 Non-Pipeline Construction	truck trips
RWTF Treatment Capacity Expansion	168
Turnout to Wetlands	20
Recycled Water Distribution System Expansion to San Quentin Prison	252
Soscol WRF Covered Storage	101
Increase Soscol WRF Filter Capacity	168
Increase ECWRF Capacity	252
WRF Phase 2 Treatment Plant Upgrades	252

Notes:

It is assumed that there would be two one-way trips per project per day, with the exception of for Soscol WRF Covered Storage, which would have two trips per day plus 101 trips for clay layer import (truck capacity of 8 cy/ round trip, layer would have a height of 1 foot over 0.25 acre equal to a volume of 403 cubic yards).

3.9.4 AVERAGE DAILY OFFROAD CONSTRUCTION EQUIPMENT HOURS FOR CALEEMOD INPUT AND EQUIPMENT FUEL USE ESTIMATES

Novato SD WRP Capacity - 1st Expansion (+0.85 MGD)

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day
Loader	203	1	8	21	168	84	2.0
Backhoe	97	1	8	21	168	84	2.0
Crane	231	1	6	63	378	84	4.5
Cement Truck	402	1	6	2	12	84	0.1
Grader	187	1	8	21	168	84	2.0
Forklifts	89	1	6	63	378	84	4.5
Generator	84	1	8	84	672	84	8.0

Notes: Construction activities with heavy equipment would be anticipated to occur over a 4 month period with two main activities: site preperation (1 month); and equipment installation (3 months). There would be approximately 21 workdays per month.

Marin County Lower Novato Creek Project - Distribution

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Rollers	80	1	6	58	347	58	6.0
Backhoe	97	1	8	58	462	58	8.0
Excavator	158	1	8	58	462	58	8.0
Crane	231	1	6	58	347	58	6.0
Loader	203	1	8	58	462	58	8.0
Generator	84	1	8	58	462	58	8.0

Notes: Construction would last approximately 3 months. It is assumed pipeline construction would proceed at a rate of approximately 100 feet per day for 58 days.

Turnout to Transitional Wetlands - Pipeline and other facilities

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Rollers	80	1	6	10	60	10	6.0
Backhoe	97	1	8	10	80	10	8.0
Excavator	158	1	8	10	80	10	8.0
Crane	231	1	6	10	60	10	6.0
Loader	203	1	8	10	80	10	8.0
Generator	84	1	8	10	80	10	8.0

Notes: Construction would last approximately two weeks.

Napa Road Pipeline

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Concrete saw	81	1	6	115	690	115	6.0
Pavers	130	1	6	115	690	115	6.0
Rollers	80	1	6	117	702	115	6.1
Backhoe	97	1	8	115	920	115	8.0
Excavator	158	1	8	131	1,048	115	9.1
Crane	231	1	6	117	702	115	6.1
Jack-and-Bore Rig	221	1	8	4	32	115	0.3
Loader	203	1	8	131	1,048	115	9.1
Generator	84	1	8	115	920	115	8.0

Notes: Construction would last approximately 6 months. It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 115 days. In addition, there would be 2 jack-and-bore crossings that would each take two weeks (one at East 8th Street and one at a creek 650 feet east of Hyde Road). 8 days of pit preparation and backfill (including one day of use for a roller and crane, and 8 days of use of an excavator and loader), and two days of boring and pipe installation for each crossing.

Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day
Loader	203	1	8	21	168	126	1.3
Backhoe	97	1	8	21	168	126	1.3
Crane	231	1	6	105	630	126	5.0
Cement Truck	402	1	6	2	12	126	0.1
Grader	187	1	8	21	168	126	1.3
Forklifts	89	1	6	105	630	126	5.0
Generator	84	1	8	126	1,008	126	8.0

Notes: Construction activities with heavy equipment would be anticipated to occur over a 6 month period with two main activities: site preperation (1 month); and equipment installation (5 months). There would be approximately 21 workdays per month.

Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Concrete saw	81	1	6	58	348	58	6.0
Pavers	130	1	6	58	348	58	6.0
Rollers	80	1	6	59	354	58	6.1
Backhoe	97	1	8	58	464	58	8.0
Excavator	158	1	8	66	528	58	9.1
Crane	231	1	6	59	354	58	6.1
Jack-and-Bore Rig	221	1	8	2	16	58	0.3
Loader	203	1	8	66	528	58	9.1
Generator	84	1	8	58	464	58	8.0

Notes: Construction would last approximately 3 months. It is assumed construction of 5,800 feet of pipeline would proceed at a rate of approximately 100 feet per day for a total of 58 days. In addition there would be 1 jack-and-bore crossing at Sir Francis Drake Boulevard (8 days of pit preparation and backfill (including one day of use for a roller and crane, and 8 days of use of an excavator and loader), and two days of boring and pipe installation for each crossing).

Increase Soscol WRF Filter Capacity

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day
Loader	203	1	8	21	168	84	2.0
Backhoe	97	1	8	21	168	84	2.0
Crane	231	1	6	63	378	84	4.5
Cement Truck	402	1	6	2	12	84	0.1
Grader	187	1	8	21	168	84	2.0
Forklifts	89	1	6	63	378	84	4.5
Generator	84	1	8	84	672	84	8.0

Notes: Construction activities with heavy equipment would be anticipated to occur over a 4 month period with two main activities: site preperation (1 month); and equipment installation (3 months). There would be approximately 21 workdays per month.

Soscol WRF Covered Storage

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day
Rollers	80	2	6	84	1,008	168	3.0
Loader	203	1	8	84	672	168	4.0
Backhoe	97	1	8	84	672	168	4.0
Grader	187	1	8	84	672	168	4.0
Forklifts	89	2	6	84	1,008	168	3.0
Off-Highway Truck	402	1	8	84	672	168	4.0
Generator	84	1	8	168	1,344	168	8.0

Notes: Construction activities with heavy equipment would be anticipated to occur over an 8-month period with two main activities: site preperation (4 months); and liner and embankment installation (4 months). There would be approximately 21 workdays per month.

Soscol WRF Covered Storage - Pipeline

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Concrete saw	81	1	6	6	36	6	6.0
Pavers	130	1	6	6	36	6	6.0
Rollers	80	1	6	6	36	6	6.0
Backhoe	97	1	8	6	48	6	8.0
Excavator	158	1	8	6	48	6	8.0
Crane	231	1	6	6	36	6	6.0
Loader	203	1	8	6	48	6	8.0
Generator	84	1	8	6	48	6	8.0

Notes: Construction would last less than 2 weeks. It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 6 days.

City of Petaluma

Increase Ellis Creek Water Reclamation Facility Capacity

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day
Loader	203	1	8	42	336	126	2.7
Backhoe	97	1	8	42	336	126	2.7
Crane	213	1	6	84	504	126	4.0
Cement Truck	402	1	6	5	30	126	0.2
Grader	187	1	8	42	336	126	2.7
Forklifts	89	1	6	84	504	126	4.0
Generator	84	1	8	126	1,008	126	8.0

Notes: Construction activities with heavy equipment would be anticipated to occur over a 6 month period with two main activities: site preperation (2 months); and equipment installation (4 months). There would be approximately 21 workdays per month.

Urban Recycled Water Expansion

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Concrete saw	81	1	6	423	2,536	423	6.0
Pavers	130	1	6	423	2,536	423	6.0
Rollers	80	1	6	431	2,584	423	6.1
Backhoe	97	1	8	423	3,381	423	8.0
Excavator	158	1	8	487	3,893	423	9.2
Crane	231	1	6	431	2,584	423	6.1
Jack-and-Bore Rig	221	1	8	16	128	423	0.3
Loader	203	1	8	487	3,893	423	9.2
Generator	84	1	8	423	3,381	423	8.0

Notes: It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 423 workdays. In addition there would be 8 jack-and-bore crossings (1 of North McDowell Boulevard, 2 of Sonoma Mountain Parkway, 1 of Lynch Creek, 1 of creek at Maria and Sunrise Parkway, 1 of Highway 101, 2 of Caulfield Lane). 8 days of pit preparation and backfill (including one day of use for a roller and crane, and 8 days of use of an excavator and loader), and two days of boring and pipe installation for each crossing.

Agricultural Recycled Water Expansion – Phases 1 and 2

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day
Concrete saw	81	1	6	176	1,056	176	6.0
Pavers	130	1	6	176	1,056	176	6.0
Rollers	80	1	6	177	1,062	176	6.0
Backhoe	97	1	8	176	1,408	176	8.0
Excavator	158	1	8	184	1,472	176	8.4
Crane	231	1	6	177	1,062	176	6.0
Jack-and-Bore Rig	221	1	8	2	16	176	0.1
Loader	203	1	8	184	1,472	176	8.4
Generator	84	1	8	176	1,408	176	8.0

Notes: It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 176 workdays. In addition there would be 1 jack-and-bore crossing at SR 116 (Stage Gulch Road) (8 days of pit preparation and backfill (including one day of use for a roller and crane, and 8 days of use of an excavator and loader), and two days of boring and pipe installation for each crossing).

City of American Canyon

Recycled Water Distribution System Expansion – Phase 1

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day	Pipeline Lengths
Concrete saw	81	1	6	92	551	92	6.0	
Pavers	130	1	6	92	551	92	6.0	17,500
Rollers	80	1	6	92	551	92	6.0	12,900
Backhoe	97	1	8	92	734	92	8.0	10,200
Excavator	158	1	8	92	734	92	8.0	1,600
Crane	231	1	6	92	551	92	6.0	60
Loader	203	1	8	92	734	92	8.0	42,260
Generator	84	1	8	92	734	92	8.0	

Notes: It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 92 workdays.

Recycled Water Distribution System Expansion – Phase 2

Off-Road Equipment	Approx. HP	Number	Hour/day	Days	Total hours	Total Workdays	Average Hours/day	Pipeline Lengths
Concrete saw	81	1	6	105	632	105	6.0	
Pavers	130	1	6	105	632	105	6.0	13,900
Rollers	80	1	6	110	662	105	6.3	3,600
Backhoe	97	1	8	105	842	105	8.0	100
Excavator	158	1	8	145	1,162	105	11.0	
Crane	231	1	6	110	662	105	6.3	
Jack-and-Bore Rig	221	1	8	10	80	105	0.8	17,600
Loader	203	1	8	145	1,162	105	11.0	
Generator	84	1	8	105	842	105	8.0	

105 workdays. In addition there would be 5 jack-and-bore crossings. 1 at SR 29 on- and off-ramps from Main Street,1 at Eucalyptus Drive, 1 at S. Napa Junction Road, 1 at Donaldson Way E., 1 at railroad al Donaldson Way E. (8 days of pit preparation and backfill (including one day of use for a roller and crane, and 8 days of use of an excavator and loader), and two days of boring and pipe installation for each crossing).

WRF Phase 2 Treatment Plant Upgrades

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day	Pipeline Lengths
Loader	203	1	8	42	336	126	2.7	
Backhoe	97	1	8	42	336	126	2.7	6,110
Crane	231	1	6	84	504	126	4.0	3,070
Cement Truck	402	1	6	5	30	126	0.2	
Grader	187	1	8	42	336	126	2.7	
Forklifts	89	1	6	84	504	126	4.0	9,180
Generator	84	1	8	126	1,008	126	8.0	

Notes: Construction activities with heavy equipment would be anticipated to occur over a 6 month period with two main activities: site preperation (2 months); and equipment installation (4 months). There would be approximately 21 workdays per month.

WRF Phase 2 Treatment Plant Upgrades - Pipelines

Off Road Equipment	Approx. HP	Number	Hour/Day	Days	Total hours	Total Workdays	Average Hours/day	Pipeline Lengths
Pavers	130	1	6	11	63	11	6.0	7,080
Rollers	80	1	6	11	63	11	6.0	2,230
Backhoe	97	1	8	11	84	11	8.0	1,220
Excavator	158	1	8	11	84	11	8.0	
Crane	231	1	6	11	63	11	6.0	
Loader	203	1	8	11	84	11	8.0	10,530
Generator	84	1	8	11	84	11	8.0	

Notes: Construction would last approximatley 11 workdays. It is assumed linear pipeline construction would proceed at a rate of approximately 100 feet per day for a total of 6 days.

3.9C CONSTRUCTION CRITERIA POLLUTANT EXHAUST EMISSIONS

2020 Maximum Day Unmitigated Construction Exhaust Emissions (pounds)

Project Component	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato Sanitation District					
Turnout to Wetlands	1.86	23.01	15.10	0.88	0.83
Subtotal	*1.86*	*23.01*	*15.10*	*0.88*	*0.83*
Sonoma Valley County Sanitation District					
Napa Road Pipeline	2.40	25.20	20.46	1.16	1.10
Subtotal	2.40	25.20	20.46	1.16	1.10
City of Petaluma					
Urban Recycled Water Expansion	2.41	25.28	20.52	1.17	1.10
Agricultural Recycled Water Expansion – Phases 1 and 2	2.35	24.97	19.98	1.13	1.07
Subtotal	*4.76*	*50.25*	*40.50*	*2.30*	*2.17*
Napa Sanitation District					
Soscol WRF Covered Storage	1.41	14.58	10.49	0.64	0.60
Soscol WRF Covered Storage - Pipeline	2.30	24.30	19.68	1.12	1.06
Subtotal	*3.71*	*38.89*	*30.17*	*1.76*	*1.66*
Marin Municipal Water District/Central Marin Sanitation Agency					
Recycled Water Distribution System Expansion to San Quentin Prison	0.88	9.61	6.58	0.42	0.40
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	2.38	24.65	20.40	1.16	1.09
Subtotal	*3.27*	*34.26*	*26.98*	*1.58*	*1.50*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	2.58	27.22	21.85	1.24	1.17
Subtotal	*2.58*	*27.22*	*21.85*	*1.24*	*1.17*
Grand Total	18.59	198.84	155.07	8.92	8.42

Notes: See Esimated Construction Phasing schdule.

2020 Maximum Day Mitigated Construction Exhaust Emissions (pounds)

Project Component	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato Sanitation District					
Turnout to Wetlands	0.49	7.59	17.79	0.03	0.03
Subtotal	*0.49*	*7.59*	*17.79*	*0.03*	*0.03*
Sonoma Valley County Sanitation District					
Napa Road Pipeline	0.53	4.52	24.12	0.02	0.02
Subtotal	0.53	4.52	24.12	0.02	0.02
City of Petaluma					
Urban Recycled Water Expansion	0.53	4.53	24.21	0.02	0.02
Agricultural Recycled Water Expansion – Phases 1 and 2	0.53	5.00	23.43	0.02	0.02
Subtotal	*1.06*	*9.53*	*47.64*	*0.04*	*0.04*
Napa Sanitation District					
Soscol WRF Covered Storage	0.28	1.74	12.28	0.01	0.01
Soscol WRF Covered Storage - Pipeline	0.51	4.69	23.01	0.02	0.02
Subtotal	*0.79*	*6.43*	*35.29*	*0.03*	*0.03*
Marin Municipal Water District/Central Marin Sanitation Agency					
Recycled Water Distribution System Expansion to San Quentin Prison	0.17	1.42	7.65	0.00	0.00
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	0.51	3.97	24.06	0.02	0.01
Subtotal	*0.69*	*5.39*	*31.71*	*0.02*	*0.02*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	0.57	4.71	26.11	0.02	0.02
Subtotal	*0.57*	*4.71*	*26.11*	*0.02*	*0.02*
Grand Total	4.14	38.18	182.67	0.16	0.15

Notes: See Esimated Construction Phasing schdule

Urban Recycled Water Expansion

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.41	25.28	20.52	1.17	1.10
Mitigated	0.53	4.53	24.21	0.02	0.02

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.35	23.84	19.70	1.16	1.09
Mitigated	0.47	3.09	23.39	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile)					Emissions (pounds/day)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck (diesel)	5	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.04	1.37	0.15	0.01	0.01
							Total	0.05	1.44	0.82	0.01	0.01

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	423	100	26	214	0.005	2.081	2.62	0.01	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

Agricultural Recycled Water Expansion – Phases 1 and 2

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.35	24.97	19.98	1.13	1.07
Mitigated	0.53	5.00	23.43	0.02	0.02

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.27	22.98	19.10	1.12	1.06
Mitigated	0.45	3.01	22.55	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile) ROG	NOx	CO	PM_{10}	$PM_{2.5}$	Emissions (pounds/day) ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	7	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.05	1.92	0.21	0.01	0.01
							Total	0.06	1.99	0.88	0.01	0.01

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	176	100	30	250	0.006	1.010	2.62	0.02	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

Recycled Water Distribution System Expansion – Phase 2

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.58	27.22	21.85	1.24	1.17
Mitigated	0.57	4.71	26.11	0.02	0.02

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.52	25.78	21.03	1.23	1.16
Mitigated	0.51	3.27	25.29	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile) ROG	NOx	CO	PM_{10}	$PM_{2.5}$	Emissions (pounds/day) ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	5	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.04	1.37	0.15	0.01	0.01
							Total	0.05	1.44	0.82	0.01	0.01

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	105	100	24	196	0.005	0.473	2.62	0.01	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

Soscol WRF Covered Storage

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	1.41	14.58	10.49	0.64	0.60
Mitigated	0.28	1.74	12.28	0.01	0.01

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	1.39	14.33	9.63	0.64	0.60
Mitigated	0.26	1.14	12.28	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

			Emission Factors (grams/mile)					Emissions (pounds/day)				
Vehicle Type	Trips/day	miles/trip	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	30	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.02	0.09	0.84	0.00	0.00
Heavy duty truck	1	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.00	0.16	0.02	0.00	0.00
							Total	0.02	0.25	0.86	0.00	0.00

Turnout to Wetlands

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	1.86	23.01	15.10	0.88	0.83
Mitigated	0.49	7.59	17.79	0.03	0.03

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	1.72	18.01	13.90	0.86	0.81
Mitigated	0.35	2.59	16.59	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

			Emission Factors (grams/mile)					Emissions (pounds/day)				
Vehicle Type	Trips/day	miles/trip	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	18	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.13	4.93	0.53	0.02	0.02
							Total	0.14	5.00	1.20	0.02	0.02

Napa Road Pipeline

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.40	25.20	20.46	1.16	1.10
Mitigated	0.53	4.52	24.12	0.02	0.02

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.34	23.76	19.64	1.15	1.09
Mitigated	0.47	3.08	23.30	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile)					Emissions (pounds/day)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	5	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.04	1.37	0.15	0.01	0.01
							Total	0.05	1.44	0.82	0.01	0.01

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	115	100	26	214	0.005	0.566	2.62	0.01	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

Recycled Water Distribution System Expansion to San Quentin Prison

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	0.88	9.61	6.58	0.42	0.40
Mitigated	0.17	1.42	7.65	0.00	0.00

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

Offroad Equipment	Emissions (pounds)				
	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	0.86	9.01	6.01	0.42	0.40
Mitigated	0.15	0.82	7.08	0.00	0.00

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile)					Emissions (pounds/day)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	18	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.05	0.51	0.00	0.00
Heavy duty truck	2	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.01	0.55	0.06	0.00	0.00
							Total	0.02	0.60	0.57	0.00	0.00

Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.38	24.65	20.40	1.16	1.09
Mitigated	0.51	3.97	24.06	0.02	0.01

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.34	23.76	19.64	1.15	1.09
Mitigated	0.47	3.08	23.30	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

Vehicle Type	Trips/day	miles/trip	Emission Factors (grams/mile)					Emissions (pounds/day)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	3	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.02	0.82	0.09	0.00	0.00
							Total	0.04	0.89	0.76	0.01	0.00

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	58	100	13	107	0.002	0.143	2.62	0.01	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

Soscol WRF Covered Storage - Pipeline

Total Daily Construction Exhaust Emissions (pounds/day)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.30	24.30	19.68	1.12	1.06
Mitigated	0.51	4.69	23.01	0.02	0.02

Includes offroad and on-road emissions sources.

Average Daily Offroad Equipment Construction Exhaust Emissions

	Emissions (pounds)				
Offroad Equipment	ROG	NOX	CO	PM_{10}	$PM_{2.5}$
Unmitigated	2.23	22.59	18.83	1.11	1.05
Mitigated	0.44	2.98	22.16	0.01	0.01

See CalEEMod output for equipment use assumptions.

On-road Daily Construction Emissions

			Emission Factors (grams/mile)					Emissions (pounds/day)				
Vehicle Type	Trips/day	miles/trip	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	24	10	0.0269	0.1327	1.2758	2.4E-03	2.2E-03	0.01	0.07	0.68	0.00	0.00
Heavy duty truck	6	30	0.1073	4.1443	0.4440	1.9E-02	1.8E-02	0.04	1.64	0.18	0.01	0.01
							Total	0.06	1.71	0.85	0.01	0.01

Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (lbs/acre) [4] ROG[4]	Emissions (lb/day) ROG	Emissions (tons/proj.) ROG
Turnout to Wetlands	6	100	30	250	0.006	0.034	2.62	0.02	0.00

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

3.9.6 CONSTRUCTION CRITERIA POLLUTANT EXHAUST EMISSIONS

Maximum Annual (2020) Construction Exhaust Emissions (tons)

Project Component	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Novato Sanitation District					
Turnout to Wetlands	0.01	0.11	0.08	0.03	0.01
Subtotal	*0.01*	*0.11*	*0.08*	*0.03*	*0.01*
Sonoma Valley County Sanitation District					
Napa Road Pipeline	0.13	1.45	1.18	0.08	0.06
Subtotal	0.13	1.45	1.18	0.08	0.06
City of Petaluma					
Urban Recycled Water Expansion	0.32	3.29	2.68	0.17	0.15
Agricultural Recycled Water Expansion – Phases 1 and 2	0.22	2.24	1.77	0.12	0.10
Subtotal	*0.53*	*5.53*	*4.45*	*0.30*	*0.24*
Napa Sanitation District					
Soscol WRF Covered Storage	0.12	1.23	0.88	0.11	0.06
Soscol WRF Covered Storage - Pipeline	0.01	0.07	0.06	0.00	0.00
Subtotal	*0.13*	*1.31*	*0.94*	*0.11*	*0.06*
Marin Municipal Water District/Central Marin Sanitation Agency					
Recycled Water Distribution System Expansion to San Quentin Prison	0.05	0.61	0.42	0.08	0.04
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	0.01	0.15	0.13	0.01	0.01
Subtotal	*0.06*	*0.76*	*0.55*	*0.10*	*0.05*
City of American Canyon					
Recycled Water Distribution System Expansion – Phase 2	0.13	1.44	1.14	0.08	0.06
Subtotal	*0.13*	*1.44*	*1.14*	*0.08*	*0.06*
Grand Total	**1.00**	**10.60**	**8.34**	**0.69**	**0.49**

Notes: See Esimated Construction Phasing schdule.

Urban Recycled Water Expansion

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.31	3.12	2.58	0.15	0.14
Auto and Truck Trips	0.01	0.17	0.10	0.01	0.00
Fugitive dust	0.00	0.00	0.00	0.02	0.00
Total Maximum Annual Emissions	0.32	3.29	2.68	0.17	0.15

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.

Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	6,048	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.01	0.09	0.00	0.00
Heavy duty truck (diesel)	1,170	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.16	0.02	0.00	0.00
							Total	0.01	0.17	0.10	0.01	0.00

See Construction Worker Auto and Truck Trips for trip assumptions. Annual trips estimated assuming 252 workdays.
Emission factors are from Emfac2014.

Agricultural Recycled Water Expansion – Phases 1 and 2

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.21	2.07	1.69	0.10	0.09
Auto and Truck Trips	0.01	0.17	0.08	0.01	0.00
Fugitive dust	0.00	0.00	0.00	0.02	0.00
Total Maximum Annual Emissions	0.22	2.24	1.77	0.12	0.10

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.
For a conservative analysis, it is assumed all emissions would occur in a single year (i.e., emissions output for 2019 and 2020 are combined).
Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	4,224	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.01	0.06	0.00	0.00
Heavy duty truck (diesel)	1,180	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.16	0.02	0.00	0.00
							Total	0.01	0.17	0.08	0.01	0.00

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.

Recycled Water Distribution System Expansion – Phase 2

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.13	1.38	1.10	0.07	0.06
Auto and Truck Trips	0.00	0.06	0.04	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.01	0.00
Total Maximum Annual Emissions	0.13	1.44	1.14	0.08	0.06

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.
For a conservative analysis, it is assumed all emissions would occur in a single year (i.e., emissions output for 2019 and 2020 are combined).
Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	2,520	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.04	0.00	0.00
Heavy duty truck (diesel)	444	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.06	0.01	0.00	0.00
See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.							Total	0.00	0.06	0.04	0.00	0.00

Soscol WRF Covered Storage

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.12	1.21	0.81	0.05	0.05
Auto and Truck Trips	0.00	0.02	0.07	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.05	0.01
Total Maximum Annual Emissions	0.12	1.23	0.88	0.11	0.06

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.
For a conservative analysis, it is assumed all emissions would occur in a single year (i.e., emissions output for 2019 and 2020 are combined).

Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	5,040	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.01	0.07	0.00	0.00
Heavy duty truck (diesel)	101	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.01	0.00	0.00	0.00
See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.							Total	0.00	0.02	0.07	0.00	0.00

Turnout to Wetlands

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.01	0.09	0.07	0.00	0.00
Auto and Truck Trips	0.00	0.02	0.01	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.03	0.01
Total Maximum Annual Emissions	0.01	0.11	0.08	0.03	0.01

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.
Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

			Emission Factors (grams/mile)					Emissions (tons/year)				
Vehicle Type	trips/year	miles/trip	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	240	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.00	0.00	0.00
Heavy duty truck (diesel)	174	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.02	0.00	0.00	0.00
							Total	0.00	0.02	0.01	0.00	0.00

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.

Napa Road Pipeline

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.13	1.37	1.13	0.07	0.06
Auto and Truck Trips	0.00	0.08	0.05	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.01	0.00
Total Maximum Annual Emissions	0.13	1.45	1.18	0.08	0.06

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.

Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	2,760	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.04	0.00	0.00
Heavy duty truck (diesel)	534	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.07	0.01	0.00	0.00
See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.							Total	0.00	0.08	0.05	0.00	0.00

Recycled Water Distribution System Expansion to San Quentin Prison

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.05	0.57	0.38	0.03	0.03
Auto and Truck Trips	0.00	0.04	0.04	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.05	0.01
Total Maximum Annual Emissions	0.05	0.61	0.42	0.08	0.04

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.

Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	2,268	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.03	0.00	0.00
Heavy duty truck (diesel)	252	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.03	0.00	0.00	0.00
See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.							Total	0.00	0.04	0.04	0.00	0.00

Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.01	0.13	0.11	0.01	0.01
Auto and Truck Trips	0.00	0.02	0.02	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.00	0.00
Total Maximum Annual Emissions	0.01	0.15	0.13	0.01	0.01

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.

Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

			Emission Factors (grams/mile)					Emissions (tons/year)				
Vehicle Type	trips/year	miles/trip	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	1,392	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.02	0.00	0.00
Heavy duty truck (diesel)	154	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.02	0.00	0.00	0.00
							Total	0.00	0.02	0.02	0.00	0.00

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.

Soscol WRF Covered Storage - Pipeline

Total Maximum Annual Construction Emissions (ton/year)

Emissions	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Offroad Equipment	0.01	0.07	0.06	0.00	0.00
Auto and Truck Trips	0.00	0.00	0.00	0.00	0.00
Fugitive dust	0.00	0.00	0.00	0.00	0.00
Total Maximum Annual Emissions	0.01	0.07	0.06	0.00	0.00

See CalEEMod Output for offroad equipment emission estimate assumptions and Construction Fugitive Dust for fugitive dust emission estimate assumptions.
Assumptions relative to auto and truck trip emission estimates are provided below.

On-road Maximum Annual Construction Emissions

Vehicle Type	trips/year	miles/trip	Emission Factors (grams/mile)					Emissions (tons/year)				
			ROG	NOx	CO	PM_{10}	$PM_{2.5}$	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Light duty truck (gas)	144	10	0.0269	0.1327	1.2758	4.7E-02	2.0E-02	0.00	0.00	0.00	0.00	0.00
Heavy duty truck (diesel)	34	30	0.1073	4.1443	0.4440	1.2E-01	5.4E-02	0.00	0.00	0.00	0.00	0.00
See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014.							Total	0.00	0.00	0.00	0.00	0.00

3.9.7 CONSTRUCTION FUGITIVE DUST

Grading and Earth Moving Fugitive Dust

2020 Maximum Day Unmitigated Construction Exhaust Emissions (pounds)

	Emissions (tons/year)		Mitigated Emissions[4] (tons/year)	
Project Component	PM10	PM2.5 [4]	PM10	PM2.5 [3]
Novato Sanitation District				
Turnout to Wetlands	0.03	0.01	0.01	0.00
Subtotal	*0.03*	*0.01*	*0.01*	*0.00*
Sonoma Valley County Sanitation District				
Napa Road Pipeline	0.01	0.00	0.00	0.00
Subtotal	0.01	0.00	0.00	0.00
City of Petaluma				
Urban Recycled Water Expansion	0.03	0.00	0.01	0.00
Agricultural Recycled Water Expansion – Phases 1 and 2	0.02	0.00	0.00	0.00
Subtotal	*0.04*	*0.01*	*0.01*	*0.00*
Napa Sanitation District				
Soscol WRF Covered Storage	0.05	0.01	0.01	0.00
Soscol WRF Covered Storage - Pipeline	0.00	0.00	0.00	0.00
Subtotal	*0.05*	*0.01*	*0.01*	*0.00*
Marin Municipal Water District/Central Marin Sanitation Agency				
Recycled Water Distribution System Expansion to San Quentin Prison	0.05	0.01	0.01	0.00
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	0.00	0.00	0.00	0.00
Subtotal	*0.05*	*0.01*	*0.01*	*0.00*
City of American Canyon				
Recycled Water Distribution System Expansion – Phase 2	0.01	0.00	0.00	0.00
Subtotal	*0.01*	*0.00*	*0.00*	*0.00*
Grand Total	0.19	0.04	0.05	0.01

Notes: See Esimated Construction Phasing schdule.

Fugitive dust from Non-Pipeline Construction Soil Disturbance

Program Project	Area Disturbed (acres/day) [1]	Days	Emission Factor (lbs/acre-day) [2]	Emissions (tons/year)		Mitigated Emissions[4] (tons/year)	
			PM10	PM10	PM2.5 [4]	PM10	PM2.5 [3]
RWTF Treatment Capacity Expansion	0.25	21	20	0.05	0.01	0.01	0.00
Turnout to Wetlands	0.25	10	20	0.03	0.01	0.01	0.00
Recycled Water Distribution System Expansion to San Quentin Prison	0.25	21	20	0.05	0.01	0.01	0.00
Soscol WRF Covered Storage	0.25	21	20	0.05	0.01	0.01	0.00
Increase Soscol WRF Filter Capacity	0.25	21	20	0.05	0.01	0.01	0.00
Increase ECWRF Capacity	0.25	42	20	0.11	0.02	0.03	0.01
WRF Phase 2 Treatment Plant Upgrades	0.25	42	20	0.11	0.02	0.03	0.01
			Total	0.45	0.09	0.11	0.02

1 It is assumed that each non-pipeline project component would disturb an average of 1/4 acre per day during site preperation.

2 The Midwest Research Institute has derived a value of 0.11 tons/acre/month, which converts to 10 pounds per day. The California Air Resources Board review has reviewed this factor and concluded that it represents PM10 emissions with watering. Consequently, CARB concludes that 20 pounds per acre day is more appropriate for unmitigated fugitive dust conditions (CARB, 2002).

3 Mitigation is assumed to reduce emissions by 75 percent, based on BAAQMD, 2017, Appendix B.

4 PM2.5 fractions for soil disturbance and earth moving were obtained from SCAQMD, 2006.

Fugitive dust from Pipeline Construction Earth Moving Activities

Program Project	Trench Soil Disturbed [5] (cubic yards)	Number of Bore Pits	Bore Pit Soil Disturbed [6] (cubic yards)	Emission Factor (pounds/cubic yard) [7] PM10	Emission Factor (pounds/cubic yard) [7] PM2.5	Emissions (tons/year) PM10	Emissions (tons/year) PM2.5 [4]	Mitigated Emissions [3] (tons/year) PM10	Mitigated Emissions [3] (tons/year) PM2.5 [4]
Marin County Lower Novato Creek - Distribution	917	0	0	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Turnout to Wetlands	1,286	0	0	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Napa Road Pipeline	7,302	2	1,778	0.001634267	0.0002475	0.01	0.00	0.00	0.00
Recycled Water Distribution System Expansion to San Quentin Prison	921	1	889	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Soscol WRF Covered Storage	519	0	0	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Urban Recycled Water Expansion	26,832	8	7,111	0.001634267	0.0002475	0.03	0.00	0.01	0.00
Agricultural Recycled Water Expansion – Phases 1 and 2	19,866	1	889	0.001634267	0.0002475	0.02	0.00	0.00	0.00
Recycled Water Distribution System Expansion – Phase 1	4,048	0	0	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Recycled Water Distribution System Expansion – Phase 2	5,618	5	4,444	0.001634267	0.0002475	0.01	0.00	0.00	0.00
WRF Phase 2 Treatment Plant Upgrades	670	0	0	0.001634267	0.0002475	0.00	0.00	0.00	0.00
Total	67,978		15,111			0.07	0.01	0.02	0.00

5 Refer to Truck Trips for Pipeline Construction for assumptions related to trench soil disturbed estimates.

6 Each horizontal boring would result in 889 cubic yards of soil disturbance = 30 feet x 10 feet x 20 feet x 2 pits per boring x 2 (excavation and back fill).

7 Based on *truck loading* emission factors included in CalEEMod. Mean wind speed is 7.1 mph. Material moisture content is 2.5% based on AP42. See CalEEMod users manual Appendix A page 10 (http://www.aqmd.gov/caleemod/doc/AppendixA.pdf).

Based on AP-42 Emission Factor: EF (lbs/ton) = k (0.0032)(U/5)^1.3 / (M/2)^1.4

Where:

EF = emission rate in pounds PM10 per ton material handled.

k = particle size multiplier (assumed 0.35 for PM10 and 0.053 for PM2.5 per CalEEMod Users Guide, Appendix A)

U = mean wind speed

M = material moisture content (%).

Particulate Matter size	pounds PM per ton material	tons material per cubic yard	pounds PM per cubic yard
PM10	0.001292763	1.2641662	0.001634267
PM2.5	0.000195761	1.2641662	0.000247475

3.9.8 ROG OFF-GASSING FROM ASPHALT PAVING

Proposed Action ROG Off-gassing from Pipeline-related Asphalt Paving

Project Component	Worddays[1]	Area Paved length/day (feet)	width (inches)[2]	(square feet)	(acres/day)[3]	acres/yr	Emission Factor (pounds/acre) [4] ROG[4]	Emissions (pounds/day) ROG	Emissions (tons/proj.) ROG
Napa Road Pipeline	115	100	26	214	0.005	0.566	2.62	0.01	0.00
Recycled Water Distribution System Expansion to San Quentin Prison	58	100	13	107	0.002	0.143	2.62	0.01	0.00
Soscol WRF Covered Storage	6	100	30	250	0.006	0.034	2.62	0.02	0.00
Urban Recycled Water Expansion	423	100	26	214	0.005	2.081	2.62	0.01	0.00
Agricultural Recycled Water Expansion – Phases 1 and 2	176	100	34	286	0.007	1.154	2.62	0.02	0.00
Recycled Water Distribution System Expansion – Phase 1	92	100	21	179	0.004	0.377	2.62	0.01	0.00
Recycled Water Distribution System Expansion – Phase 2	105	100	24	196	0.005	0.473	2.62	0.01	0.00
WRF Phase 2 Treatment Plant Upgrades	11	100	26	214	0.005	0.054	2.62	0.01	0.00
Total				1,661	0	5		0.10	0.006

Notes:

[1] See Average Daily Offroad Construction Equipment Hours for assumptions regarding workdays.

[2] See Truck Trips for Pipeline Construction for trench dimensions.

[3] There are 43560 square feet per acre.

[4] Emission factor source is from CalEEMod, 2013, and is described in terms of volatile organic compounds, which for the purposes of this analysis is equivalent to reactive organic compounds.

3.9.9 EMERGENCY GENERATOR TESTING CRITERIA POLLUTANT EMISSIONS

Criteria Pollutant Emission Factors

Project	Approx. kW[a]	Load Factor[b]	Emission Factors (gkWhr)[c]				Emission Rates (lb/hr)				
			HC[c]	NOx[d]	PM[e]	CO[c]	ROG[d]	NOx	PM10	PM2.5	CO
RWTF Treatment Capacity Expansion	62	0.74	0.235	4.47	0.2	5.00	0.02	0.45	0.02	0.02	0.50
Increase ECWRF Capacity	228	0.74	0.2	3.80	0.2	3.50	0.08	1.42	0.07	0.07	1.30
Increase Soscol WRF Filter Capacity	120	0.74	0.2	3.80	0.2	5.00	0.04	0.75	0.04	0.04	0.98
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	26	0.74	0.235	4.47	0.2	5.00	0.01	0.19	0.01	0.01	0.22
WRF Phase 2 Treatment Plant Upgrades	68	0.74	0.235	4.47	0.2	5.00	0.03	0.49	0.02	0.02	0.55

Notes:

[1] Proposed emergency generator hp ratings are based on electricity usage per year (kWh), assuming operation for half the year and 74% load with fan. Hp = hph/(24*365*1/2) / 0.74

[b] Load factors are from CalEEMod.

[c] Emission factors are based on BAAQMD BACT Guideline (BAAQMD, 2015).

[d] A factor of 1.053 was applied to HC to obtain ROG based on USEPA, 2010. A factor of 0.967 was applied to PM to obtain PM10 and a factor of 0.991 was applied to PM10 to obtain PM2.5 based on SCAQMD (2006).

Emergency Generator Criteria Pollutant Emissions

Equipment	Test Duration		Maximum Day (lbs/day)					Maximum Annual (tons/year)				
	hrs/test	test/yr	ROG	NOx	PM10	PM2.5	CO	ROG	NOx	PM10	PM2.5	CO
RWTF Treatment Capacity Expansion	4.2	12	0.10	1.89	0.08	0.08	2.11	0.00	0.01	0.00	0.00	0.01
Increase ECWRF Capacity	4.2	12	0.33	5.94	0.31	0.30	5.48	0.00	0.04	0.00	0.00	0.03
Increase Soscol WRF Filter Capacity	4.2	12	0.17	3.13	0.16	0.16	4.12	0.00	0.02	0.00	0.00	0.02
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	4.2	12	0.04	0.81	0.04	0.04	0.91	0.00	0.00	0.00	0.00	0.01
WRF Phase 2 Treatment Plant Upgrades	4.2	12	0.12	2.08	0.09	0.09	2.33	0.00	0.01	0.00	0.00	0.01
Notes:		Total	0.77	13.85	0.67	0.67	14.94	0.00	0.08	0.00	0.00	0.09

It is assumed that each diesel generator would be tested approximately 50 hours per year (4.2 hours per test, 12 tests per year) pursuant to BAAQMD Regulation 9-8-330.

3.9.10 GHG CONSTRUCTION EMISSIONS

Total Construction GHG Emissions Summary

Project Component	CO_2e Emissions (metric tons)
Novato Sanitation District	
RWTF Treatment Capacity Expansion	67.60
Marin County Lower Novato Creek - Distribution	82.19
Turnout to Wetlands	21.43
Subtotal	171.22
Sonoma Valley County Sanitation District	
Napa Road Pipeline	225.91
Subtotal	225.91
Marin Municipal Water District/Central Marin Sanitation Agency	
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	91.65
Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline	38.61
Subtotal	130.25
Napa Sanitation District	
Increase Soscol WRF Filter Capacity	96.96
Soscol WRF Covered Storage	190.63
Soscol WRF Covered Storage - Pipeline	11.54
Subtotal	299.13
City of Petaluma	
Increase ECWRF Capacity	109.91
Urban Recycled Water Expansion	835.75
Agricultural Recycled Water Expansion – Phases 1 and 2	354.32
Subtotal	1,299.98
City of American Canyon	
Recycled Water Distribution System Expansion – Phase 1	171.90
Recycled Water Distribution System Expansion – Phase 2	221.25
WRF Phase 2 Treatment Plant Upgrades	118.26
WRF Phase 2 Treatment Plant Upgrades - Pipeline	47.49
Subtotal	558.90
Total Emissions	2,685.39
Amortized over 30 years	89.51

RWTF Treatment Capacity Expansion

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	67.60

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment					54.46	54.46

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	1,512	307.76	0.045	0.087	5	0.00	0.00	5
Heavy duty truck	30	168	1,601.47	0.005	0.005	8	0.00	0.00	8
					Total	13	0.00	0.00	13

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Marin County Lower Novato Creek - Distribution

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	82.19

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment				69.88		69.88

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	1,392	318.22	0.045	0.087	4	0.00	0.00	5
Heavy duty truck	30	154	1,619.44	0.005	0.005	7	0.00	0.00	8
					Total	12	0.00	0.00	12

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Turnout to Wetlands

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	21.43

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment			12.05			12.05

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	240	328.34	0.045	0.087	1	0.00	0.00	1
Heavy duty truck	30	174	1,636.72	0.005	0.005	9	0.00	0.00	9
					Total	9	0.00	0.00	9

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Napa Road Pipeline

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	225.91

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment			189.84			189.84

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,760	328.34	0.045	0.087	9	0.00	0.00	10
Heavy duty truck	30	534	1,636.72	0.005	0.005	26	0.00	0.00	26
					Total	35	0.00	0.00	36

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	91.65

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment			71.20			71.20

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,268	328.34	0.045	0.087	7	0.00	0.00	8
Heavy duty truck	30	252	1,636.72	0.005	0.005	12	0.00	0.00	12
					Total	20	0.00	0.00	20

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Recycled Water Distribution System Expansion to San Quentin Prison - Pipeline

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	38.61

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment			18.16			18.16

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	1,392	328.34	0.045	0.087	7	0.00	0.00	8
Heavy duty truck	30	154	1,636.72	0.005	0.005	12	0.00	0.00	12
					Total	20	0.00	0.00	20

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Increase Soscol WRF Filter Capacity

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	96.96

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment	31.19	51.93				83.12

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	1,512	337.16	0.045	0.087	5	0.00	0.00	6
Heavy duty truck	30	168	1,652.36	0.005	0.005	8	0.00	0.00	8
					Total	13	0.00	0.00	14

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Soscol WRF Covered Storage

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	190.63

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment		2.03	165.73			167.76

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	5,040	328.34	0.045	0.087	17	0.00	0.00	18
Heavy duty truck	30	101	1,636.72	0.005	0.005	5	0.00	0.00	5
					Total	21	0.00	0.00	23

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Soscol WRF Covered Storage - Pipeline

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	11.54

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment			9.38			9.38

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	144	328.34	0.045	0.087	0	0.00	0.00	1
Heavy duty truck	30	34	1,636.72	0.005	0.005	2	0.00	0.00	2
					Total	2	0.00	0.00	2

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Increase ECWRF Capacity

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	109.91

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment		89.15				89.15

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,268	337.16	0.045	0.087	8	0.00	0.00	8
Heavy duty truck	30	252	1,652.36	0.005	0.005	12	0.00	0.00	13
					Total	20	0.00	0.00	21

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Urban Recycled Water Expansion

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	835.75

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment		94.35	434.61	174.18		703.14

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	10,152	328.34	0.045	0.087	33	0.00	0.01	36
Heavy duty truck	30	1,964	1,636.72	0.005	0.005	96	0.00	0.00	97
					Total	130	0.00	0.01	133

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Agricultural Recycled Water Expansion – Phases 1 and 2

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	354.32

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment		59.86	221.46			281.32

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	4,224	328.34	0.045	0.087	14	0.00	0.00	15
Heavy duty truck	30	1,180	1,636.72	0.005	0.005	58	0.00	0.00	58
					Total	72	0.00	0.00	73

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Recycled Water Distribution System Expansion – Phase 1

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	171.90

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment	33.70	112.66				146.36

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,208	337.16	0.045	0.087	7	0	0	8
Heavy duty truck	30	353	1,652.36	0.005	0.005	17	0	0	17
					Total	25	0.00	0.00	26

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

Recycled Water Distribution System Expansion – Phase 2

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	221.25

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment		40.42	150.05			190.47

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,520	328.34	0.045	0.087	8	0.00	0.00	9
Heavy duty truck	30	444	1,636.72	0.005	0.005	22	0.00	0.00	22
					Total	30	0.00	0.00	31

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

WRF Phase 2 Treatment Plant Upgrades

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	118.26

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment				31.41	56.55	87.96

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	2,268	318.22	0.045	0.087	8	0.00	0.00	9
Heavy duty truck	30	252	1,619.44	0.005	0.005	22	0.00	0.00	22
					Total	30	0.00	0.00	30

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

WRF Phase 2 Treatment Plant Upgrades - Pipeline

Total Construction Emissions (metric tons)

Source	CO_2e
Construction Emissions	47.49

Includes offroad and on-road emissions sources.

Total Offroad Equipment Emissions

	CO_2e (metric tons)					
Source	2018	2019	2020	2021	2022	Total
Off-road Equipment				17.19		17.19

See CalEEMod output for equipment use assumptions.

Total On-road Construction GHG Emissions

			Emission Factors (gram/mile)			Total Emissions (Metric tons)			
On-road Sources	Miles/trip	Trips	CO_2	CH_4	N2O	CO_2	CH_4	N_2O	CO_2e
Light duty truck	10	264	318.22	0.045	0.087	8	0.00	0.00	9
Heavy duty truck	30	49	1,619.44	0.005	0.005	22	0.00	0.00	22
					Total	30	0.00	0.00	30

See Construction Worker Auto and Truck Trips for trip assumptions. Emission factors are from Emfac2014 (for CO_2) and TCR, 2017 (for N_2O and CH_4). It is assumed that workers would commute 10 miles to the construction site and truck trips would average 30 miles one-way.

3.9.11 GHG OPERATIONAL EMISSIONS

Total GHG Emissions for Operations of the Proposed Action

Operation Emissions Source	GHG Emissions (CO2e per year)		
	Increase in Electricity Consumption	Emergency Generator Testing	Total
RWTF Treatment Capacity Expansion	26.49	0.90	27.39
Increase ECWRF Capacity	98.02	3.97	101.99
ase Soscol WRF Filter Capacity	51.66	1.68	53.34
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	11.35	2.58	13.93
WRF Phase 2 Treatment Plant Upgrades	29.14	5.65	34.79
Total	216.66	14.78	231.44

Indirect Emissions from Electricity Consumption

GHGs from Electricity Consumption					Estimated Emergency Generator Ratings					
GHG	Emission Factor (lb/kWh)	Electricity Consumption kWhr	metric tons	CO_2e* (metric tons)	Assuming 24/365 operation (kW)	Assuming operations half of year (kW)	kW Rattings Assuming operations at 74% load	Assuming 24/365 operation (hp)	Assuming operations half of year (hp)	HP Rattings Assuming operations at 74% load
RWTF Treatment Capacity Expansion										
CO_2	0.29000	200,000	26.31	26.31	22.8	45.7	61.7	30.6	61.2	82.7
CH_4	0.000033	200,000	0.00	0.08						
N_20	0.000004	200,000	0.00	0.11						
			Total =	26.49						
Increase ECWRF Capacity										
CO_2	0.29000	740,000	97.34	97.34	84.5	168.9	228.3	113.2	226.4	305.9
CH_4	0.000033	740,000	0.01	0.28						
N_20	0.000004	740,000	0.00	0.40						
			Total =	98.02						
Increase Soscol WRF Filter Capacity										
CO_2	0.29000	390,000	51.30	51.30	44.5	89.0	120.3	59.7	119.3	161.2
CH_4	0.000033	390,000	0.01	0.15						
N_20	0.000004	390,000	0.00	0.21						
			Total =	51.66						
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities										
CO_2	0.29000	85,690	11.27	11.27	9.8	19.6	26.4	13.1	26.2	35.4
CH_4	0.000033	85,690	0.00	0.03						
N_20	0.000004	85,690	0.00	0.05						
			Total =	11.35						

Indirect Emissions from Electricity Consumption

GHGs from Electricity Consumption					Estimated Emergency Generator Ratings					
GHG	Emission Factor (lb/kWh)	Electricity Consumption kWhr	metric tons	CO_2e* (metric tons)	Assuming 24/365 operation (kW)	Assuming operations half of year (kW)	kW Rattings Assuming operations at 74% load	Assuming 24/365 operation (hp)	Assuming operations half of year (hp)	HP Rattings Assuming operations at 74% load
WRF Phase 2 Treatment Plant Upgrades										
CO_2	0.29000	220,000	28.94	28.94	25.1	50.2	67.9	33.7	67.3	91.0
CH_4	0.000033	220,000	0.00	0.08						
N_20	0.000004	220,000	0.00	0.12						
			Total =	29.14						
			Grand Total =	216.66						

Notes: The emission factor for CO_2 was obtained from PG&E, 2015. Emission factors for CH_4 and N_2O are from TCR, 2017.
Project electricity consumption estimates obtained from "Summary of Energy for Projects."
*Global Warming Potential for CH_4 = 25; GWP for N_2O = 298 (CARB, 2014).
California Air Resources Board (CARB), 2014. Updated Scoping Report. May 2014.
Pacific Gas and Electric Company (PG&E), 2015. Greenhouse Gas Emission Factors: Guidance for PG&E Customers, November 2015.
The Climate Registry (TCR), 2017. The Climate Registry 2017 Default Emission Factors, March 15, 2017.
Proposed emergency generator hp ratings are based on electricity usage per year (kWh), assuming operation for half the year and 74% load with fan. Hp = hph/(24*365*1/2) / 0.74

Emergency Generator Emissions

GHG Emissions Factors for Diesel Exhaust

Fuel	CO_2 (g/gal)	N_2O (g/gal)	CH_4 (g/gal)
Diesel Fuel	10,210.00	0.26	0.58

Notes: Emission factors obtained from TCR, 2016, Tables 13.1 and 13.7.

Emergency Generator Emissions

Project	Approx. HP[a]	Offroad HP range	Hrs/yr	Consumption[b] gal/hr	Consumption[b] gal/yr	Total Emissions (metric tons) CO_2	N_2O	CH_4	CO_2e
RWTF Treatment Capacity Expansion	83	51-120	50.00	1.75	87.48	0.893	0.000	0.000	0.90
Increase ECWRF Capacity	306	251-500	50.00	7.71	385.27	3.934	0.000	0.000	3.97
Increase Soscol WRF Filter Capacity	161	121-175	50.00	3.26	162.95	1.664	0.000	0.000	1.68
Recycled Water Distribution System Expansion to San Quentin Prison - Pump Station and Other Facilities	35	1--50	50.00	0.91	45.62	2.56	0.00	0.00	2.58
WRF Phase 2 Treatment Plant Upgrades	91	51-120	50.00	1.75	87.48	5.60	0.00	0.00	5.65

Assumed at 75 percent load with fan.
[a] Proposed generator hp ratings are based on electricity usage per year (kWh), assuming operation for half the year and 75% load with fan. Hp = hp-hr/(24*365*1/2) / 0.75
[b] Diesel fuel consumption factors are obtained from Offroad 2011, see Equipment and Fuel Use.

3.9.12 EMFAC 2014 ON-ROAD EMISSION FACTORS

EMFAC2014 (v1.0.7) Emission Rates
Region Type: Air Basin
Region: San Francisco Air Basin
Calendar Year: 2018
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_PMTW	PM2_5_PMBW
San Francisco Bay Area	2018	LDT1	Aggregated	Aggregated	GAS	218857	7204135	1E+06	0.041	1.6614	0.17308	345.67	0.00269	0.008	0.0368	0.00248	0.002	0.01575
San Francisco Bay Area	2018	T7 single construction	Aggregated	Aggregated	DSL	1169	106789.2	0	0.1451	0.5534	5.41562	1668.9	0.03735	0.036	0.0617	0.03573	0.009	0.02646

EMFAC2014 (v1.0.7) Emission Rates
Region Type: Air Basin
Region: San Francisco Air Basin
Calendar Year: 2019
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_PMTW	PM2_5_PMBW
San Francisco Bay Area	2019	LDT1	Aggregated	Aggregated	GAS	213974	7071282	1E+06	0.0328	1.4523	0.15121	337.16	0.00255	0.008	0.0368	0.00234	0.002	0.01575
San Francisco Bay Area	2019	T7 single construction	Aggregated	Aggregated	DSL	1034.9	96474.09	0	0.1363	0.5321	4.98252	1652.4	0.03297	0.036	0.0617	0.03155	0.009	0.02646

EMFAC2014 (v1.0.7) Emission Rates
Region Type: Air Basin
Region: San Francisco Air Basin
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_PMTW	PM2_5_PMBW
San Francisco Bay Area	2020	LDT1	Aggregated	Aggregated	GAS	210162	6961771	1E+06	0.0269	1.2758	0.13271	328.34	0.00242	0.008	0.0368	0.00222	0.002	0.01575
San Francisco Bay Area	2020	T7 single construction	Aggregated	Aggregated	DSL	894.37	85141.05	0	0.1073	0.444	4.14427	1636.7	0.01907	0.036	0.0617	0.01824	0.009	0.02646

EMFAC2014 (v1.0.7) Emission Rates
Region Type: Air Basin
Region: San Francisco Air Basin
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_PMTW	PM2_5_PMBW
San Francisco Bay Area	2021	LDT1	Aggregated	Aggregated	GAS	207449	6877710	1E+06	0.0238	1.1515	0.11823	318.22	0.0023	0.008	0.0368	0.00212	0.002	0.01575
San Francisco Bay Area	2021	T7 single construction	Aggregated	Aggregated	DSL	976.64	93306.01	0	0.1035	0.4408	3.66197	1619.4	0.017	0.036	0.0617	0.01627	0.009	0.02646

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region Type: Air Basin
Region: San Francisco Air Basin
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_PMTW	PM2_5_PMBW
San Francisco Bay Area	2022	LDT1	Aggregated	Aggregated	GAS	205466	6799689	1E+06	0.0211	1.0413	0.10532	307.76	0.00221	0.008	0.0368	0.00203	0.002	0.01575
San Francisco Bay Area	2022	T7 single construction	Aggregated	Aggregated	DSL	1060.1	101819.4	0	0.0997	0.4374	3.24926	1601.5	0.01462	0.036	0.0617	0.01399	0.009	0.02646

Source: EMFAC 2014 Web Database (v1.0.7)
https://www.arb.ca.gov/emfac/2014/

3.9.13 EQUIPMENT AND VEHICLE FUEL USE

Construction

Total Fuel Use During Contruction

Fuel Type	Fuel Consumed (gal/proj)	Fuel Consumed (av. gal/yr)	Gallons sold in region in 2015	% Project gall/County gal
Gasoline	19,403	5,544	369,000,000	0.00%
Diesel	216,864	61,961	29,000,000	0.21%

Gallons sold in region refers to gallons sold in Marin, Sonoma, and Napa counties

Construction Equipment Fuel Consumptoin Factors from Off-road 2011 Model

Calendar Year	Air Basin	Equipment Type	Horsepower	BSFC (lbs/yr)	Activity (hrs/yr)	BSFC (gal/hr)*
2019	SF	Bore/Drill Rigs	250	377109.22	9982.506466	5.32
2019	SF	Cranes	250	1301219.26	56605.27427	3.24
2019	SF	Excavators	175	4083729.192	199454.5433	2.88
2019	SF	Graders	250	4282443.33	138626.7346	4.35
2019	SF	Off-Highway Trucks	500	12199515.91	232353.6828	7.39
2019	SF	Other Construction Equipment	50	333813.6072	51507.20534	0.91
2019	SF	Other Construction Equipment	120	1047240.19	84278.99536	1.75
2019	SF	Other Construction Equipment	175	569798.183	24616.95258	3.26
2019	SF	Other Construction Equipment	250	730628.8989	21953.71797	4.69
2019	SF	Other Construction Equipment	500	2491192.195	45519.82311	7.71
2019	SF	Pavers	175	538847.4765	22312.23101	3.40
2019	SF	Rollers	120	1312518.746	109329.7204	1.69
2019	SF	Rough Terrain Forklifts	120	3444098.558	241960.8326	2.00
2019	SF	Rubber Tired Loaders	250	9290005.392	341522.9882	3.83
2019	SF	Tractors/Loaders /Backhoes	120	20196519.46	1794561.153	1.58

*There is 1.874 pounds/liter of diesel, and 3.79 liters/gallon.

SF = San Francisco Bay Air Basin; BSFC = brake specific fuel consumption.

Construction Equipment Total Diesel Fuel Use

Off Road Equipment	Fuel Consumption (gal/hr)	Total Hours (hrs/project)	Diesel Fuel Consumed (gal/prog)	Diesel Fuel Consumed (av. gal/yr)
Concrete saw	1.7	5,622	9,835	2,810
Pavers	3.4	5,912	20,101	5,743
Rollers	1.7	7,428	12,556	3,587
Backhoe	1.6	10,272	16,277	4,651
Excavator	2.9	6,106	17,603	5,029
Crane	3.2	8,814	28,528	8,151
Jack-and-Bore Rig	5.3	272	1,447	413
Loader	3.8	11,360	43,509	12,431
Generator	1.7	14,136	24,732	7,066
Forklifts	2.0	3,402	6,818	1,948
Concrete truck	7.4	96	710	203
Grader	4.3	1,848	8,038	2,297
	Total	75,270	190,154	54,330
	Average gallons/hour		2.5	

See Average Daily Offroad Construction Equipment Hours regarding the equipment total hours estimates.

Construction Vehicles Total Fuel Use

Vehicle Type	Fuel Type	Total Trips	Miles/trip	Total Miles Travelled	Ave consum. rate (miles/gallon)	Total Gallons	
						gal/proj	gal/year
Light Duty Truck	gasoline	40,164	10	401,640	20.7	19,403	5,544
Heavy Duty Truck	diesel	6,232	30	186,968	7.0	26,710	7,631

diesel fuel economcy obtained from http://www.dieselforum.org/about-clean-diesel/trucking

Operation and Maintenance

Emergency Generator Diesel Fuel Use

Project	Approx. HP[a]	Offroad HP range	Hrs/yr	Diesel Fuel Consumption[b]	
				gal/hr	gal/yr
RWTF Treatment Capacity Expansion	83	51-120	50.00	1.75	87.48
Increase ECWRF Capacity	306	251-500	50.00	7.71	385.27
Increase Soscol WRF Filter Capacity	161	121-175	50.00	3.26	162.95
Distribution System Expansion to San Quentin	35	1--50	50.00	0.91	250.42
WRF Phase 2 Treatment Plant Upgrades	91	51-120	50.00	1.75	548.22
Total					1,434.34

See GHG Operational Emissions sheet for assumptions on hp ratings.

Assumed at 75 percent load with fan.

ratings are based on electricity usage per year

[b] Diesel fuel consumption factors are obtained from Offroad 2011, see Equipment and Fuel Use.

APPENDIX 3.9D

NBWRP Phase 2 San Francisco Bay Area Air Basin, Summer

North Bay Water Reuse Program Phase 2

San Francisco Bay Area Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	100.00	User Defined Unit	1.00	1.00	1

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Placeholder; Model run only for construction.

Construction Phase - See Construction Equipment Work Hours estimated outside of model for total days assumptions.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project. Pavers and concrete saws are not required because the pipeline would not be installed within a road.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project.

Off-road Equipment - Changed per project; pavers not required because pipeilne would not be installed within a road.

Off-road Equipment - Changed per project.

Construction Off-road Equipment Mitigation - Mitigation to use Tier 4 off-road equipment.

North Bay Water Reuse Program Phase 2 - San Francisco Bay Area Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	250	0
tblAreaCoating	Area_Nonresidential_Exterior	1	0
tblAreaCoating	Area_Nonresidential_Interior	2	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	15.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	16.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	16.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	16.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1.00	126.00
tblConstructionPhase	NumDays	1.00	126.00
tblConstructionPhase	NumDays	1.00	11.00
tblConstructionPhase	NumDays	1.00	6.00
tblConstructionPhase	NumDays	1.00	58.00
tblConstructionPhase	NumDays	1.00	126.00
tblConstructionPhase	NumDays	1.00	11.00
tblConstructionPhase	NumDays	1.00	84.00
tblConstructionPhase	NumDays	1.00	92.00
tblConstructionPhase	NumDays	1.00	126.00
tblConstructionPhase	NumDays	1.00	423.00
tblConstructionPhase	NumDays	1.00	176.00
tblConstructionPhase	NumDays	1.00	105.00
tblConstructionPhase	NumDays	1.00	168.00
tblConstructionPhase	NumDays	1.00	10.00
tblConstructionPhase	NumDays	1.00	115.00
tblLandUse	BuildingSpaceSquareFeet	0.00	1.00
tblLandUse	GreenSpaceAllowEdit	0.00	1.00
tblLandUse	LandUseSquareFeet	0.00	1.00
tblLandUse	LotAcreage	0.00	1.00
tblLandUse	Population	0.00	1.00
tblLandUse	RecSwimmingAreaAllowEdit	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	PhaseName		Site Preparation1
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	PhaseName		Site Preparation1
tblOffRoadEquipment	PhaseName		Site Preparation1
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
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tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	PhaseName		Site Preparation1
tblOffRoadEquipment	PhaseName		Site Preparation13
tblOffRoadEquipment	PhaseName		Site Preparation8
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.30
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.30

tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2024
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleEF	HHD	0.41	0.62
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.08	0.12
tblVehicleEF	HHD	1.59	2.70
tblVehicleEF	HHD	0.92	1.02
tblVehicleEF	HHD	3.16	3.42
tblVehicleEF	HHD	4,294.05	4,628.81
tblVehicleEF	HHD	1,558.12	1,675.61
tblVehicleEF	HHD	9.89	10.11
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	13.97	22.72
tblVehicleEF	HHD	2.00	4.49
tblVehicleEF	HHD	19.60	19.70
tblVehicleEF	HHD	8.2000e-003	0.02
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.2050e-003	0.02
tblVehicleEF	HHD	9.2000e-005	1.1600e-004
tblVehicleEF	HHD	7.8450e-003	0.02
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8150e-003	8.8050e-003
tblVehicleEF	HHD	5.9370e-003	0.02
tblVehicleEF	HHD	8.4000e-005	1.0700e-004
tblVehicleEF	HHD	7.5000e-005	9.5000e-005
tblVehicleEF	HHD	4.1270e-003	5.8140e-003
tblVehicleEF	HHD	0.41	0.69
tblVehicleEF	HHD	4.9000e-005	6.0000e-005
tblVehicleEF	HHD	0.09	0.15
tblVehicleEF	HHD	3.5100e-004	5.2500e-004

tblVehicleEF	HHD	0.07	0.11
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	1.5100e-004	1.5800e-004
tblVehicleEF	HHD	7.5000e-005	9.5000e-005
tblVehicleEF	HHD	4.1270e-003	5.8140e-003
tblVehicleEF	HHD	0.48	0.79
tblVehicleEF	HHD	4.9000e-005	6.0000e-005
tblVehicleEF	HHD	0.16	0.22
tblVehicleEF	HHD	3.5100e-004	5.2500e-004
tblVehicleEF	HHD	0.08	0.13
tblVehicleEF	HHD	0.38	0.59
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.07	0.11
tblVehicleEF	HHD	1.15	1.97
tblVehicleEF	HHD	0.93	1.03
tblVehicleEF	HHD	2.88	3.13
tblVehicleEF	HHD	4,549.17	4,901.04
tblVehicleEF	HHD	1,558.12	1,675.61
tblVehicleEF	HHD	9.89	10.11
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	14.42	23.44
tblVehicleEF	HHD	1.92	4.32
tblVehicleEF	HHD	19.59	19.68
tblVehicleEF	HHD	6.9130e-003	0.02
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.2050e-003	0.02
tblVehicleEF	HHD	9.2000e-005	1.1600e-004
tblVehicleEF	HHD	6.6140e-003	0.02
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8150e-003	8.8050e-003
tblVehicleEF	HHD	5.9370e-003	0.02
tblVehicleEF	HHD	8.4000e-005	1.0700e-004
tblVehicleEF	HHD	1.7700e-004	2.3700e-004

tblVehicleEF	HHD	4.4470e-003	6.3260e-003
tblVehicleEF	HHD	0.38	0.65
tblVehicleEF	HHD	1.0700e-004	1.4400e-004
tblVehicleEF	HHD	0.09	0.15
tblVehicleEF	HHD	3.3900e-004	5.1700e-004
tblVehicleEF	HHD	0.07	0.11
tblVehicleEF	HHD	0.04	0.05
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	1.4600e-004	1.5400e-004
tblVehicleEF	HHD	1.7700e-004	2.3700e-004
tblVehicleEF	HHD	4.4470e-003	6.3260e-003
tblVehicleEF	HHD	0.45	0.75
tblVehicleEF	HHD	1.0700e-004	1.4400e-004
tblVehicleEF	HHD	0.16	0.22
tblVehicleEF	HHD	3.3900e-004	5.1700e-004
tblVehicleEF	HHD	0.08	0.12
tblVehicleEF	HHD	0.44	0.67
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.08	0.13
tblVehicleEF	HHD	2.19	3.71
tblVehicleEF	HHD	0.92	1.01
tblVehicleEF	HHD	3.40	3.69
tblVehicleEF	HHD	3,941.75	4,252.86
tblVehicleEF	HHD	1,558.12	1,675.61
tblVehicleEF	HHD	9.89	10.11
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	13.35	21.72
tblVehicleEF	HHD	2.03	4.56
tblVehicleEF	HHD	19.62	19.72
tblVehicleEF	HHD	9.9760e-003	0.03
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.2050e-003	0.02
tblVehicleEF	HHD	9.2000e-005	1.1600e-004
tblVehicleEF	HHD	9.5450e-003	0.03

tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8150e-003	8.8050e-003
tblVehicleEF	HHD	5.9370e-003	0.02
tblVehicleEF	HHD	8.4000e-005	1.0700e-004
tblVehicleEF	HHD	3.7000e-005	4.1000e-005
tblVehicleEF	HHD	4.2800e-003	6.3370e-003
tblVehicleEF	HHD	0.44	0.74
tblVehicleEF	HHD	2.4000e-005	2.6000e-005
tblVehicleEF	HHD	0.09	0.15
tblVehicleEF	HHD	3.9300e-004	5.7900e-004
tblVehicleEF	HHD	0.08	0.12
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	1.5500e-004	1.6300e-004
tblVehicleEF	HHD	3.7000e-005	4.1000e-005
tblVehicleEF	HHD	4.2800e-003	6.3370e-003
tblVehicleEF	HHD	0.51	0.86
tblVehicleEF	HHD	2.4000e-005	2.6000e-005
tblVehicleEF	HHD	0.16	0.22
tblVehicleEF	HHD	3.9300e-004	5.7900e-004
tblVehicleEF	HHD	0.09	0.13
tblVehicleEF	LDA	3.2450e-003	4.9090e-003
tblVehicleEF	LDA	4.5130e-003	7.8890e-003
tblVehicleEF	LDA	0.47	0.63
tblVehicleEF	LDA	1.05	1.59
tblVehicleEF	LDA	229.68	271.43
tblVehicleEF	LDA	53.11	61.58
tblVehicleEF	LDA	0.58	0.57
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.06	0.10
tblVehicleEF	LDA	1.6780e-003	1.8480e-003
tblVehicleEF	LDA	2.2420e-003	2.3430e-003
tblVehicleEF	LDA	1.5460e-003	1.7050e-003
tblVehicleEF	LDA	2.0610e-003	2.1540e-003
tblVehicleEF	LDA	0.03	0.04

tblVehicleEF	LDA	0.09	0.12
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	8.1700e-003	0.01
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	0.06	0.11
tblVehicleEF	LDA	2.2990e-003	2.7180e-003
tblVehicleEF	LDA	5.4900e-004	6.4300e-004
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.09	0.12
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	0.07	0.12
tblVehicleEF	LDA	3.6190e-003	5.4630e-003
tblVehicleEF	LDA	3.7150e-003	6.4710e-003
tblVehicleEF	LDA	0.56	0.74
tblVehicleEF	LDA	0.82	1.24
tblVehicleEF	LDA	247.75	292.85
tblVehicleEF	LDA	53.11	61.58
tblVehicleEF	LDA	0.58	0.57
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.05	0.09
tblVehicleEF	LDA	1.6780e-003	1.8480e-003
tblVehicleEF	LDA	2.2420e-003	2.3430e-003
tblVehicleEF	LDA	1.5460e-003	1.7050e-003
tblVehicleEF	LDA	2.0610e-003	2.1540e-003
tblVehicleEF	LDA	0.06	0.09
tblVehicleEF	LDA	0.10	0.14
tblVehicleEF	LDA	0.05	0.07
tblVehicleEF	LDA	9.0940e-003	0.01
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.05	0.09
tblVehicleEF	LDA	2.4810e-003	2.9340e-003
tblVehicleEF	LDA	5.4500e-004	6.3700e-004
tblVehicleEF	LDA	0.06	0.09

tblVehicleEF	LDA	0.10	0.14
tblVehicleEF	LDA	0.05	0.07
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.05	0.10
tblVehicleEF	LDA	3.1630e-003	4.8040e-003
tblVehicleEF	LDA	5.1000e-003	8.9430e-003
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tblVehicleEF	LDA	53.11	61.58
tblVehicleEF	LDA	0.58	0.57
tblVehicleEF	LDA	0.04	0.07
tblVehicleEF	LDA	0.06	0.11
tblVehicleEF	LDA	1.6780e-003	1.8480e-003
tblVehicleEF	LDA	2.2420e-003	2.3430e-003
tblVehicleEF	LDA	1.5460e-003	1.7050e-003
tblVehicleEF	LDA	2.0610e-003	2.1540e-003
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.09	0.13
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	7.9650e-003	0.01
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.07	0.12
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tblVehicleEF	LDA	5.5200e-004	6.4800e-004
tblVehicleEF	LDA	0.01	0.02
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tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.08	0.13
tblVehicleEF	LDT1	6.6480e-003	0.01
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.86	1.27

tblVehicleEF	LDT1	2.15	3.40
tblVehicleEF	LDT1	285.82	328.14
tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.08	0.13
tblVehicleEF	LDT1	0.12	0.19
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003
tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.19	0.27
tblVehicleEF	LDT1	0.06	0.08
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.14	0.18
tblVehicleEF	LDT1	0.14	0.23
tblVehicleEF	LDT1	2.8670e-003	3.2960e-003
tblVehicleEF	LDT1	6.9800e-004	8.0100e-004
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.19	0.27
tblVehicleEF	LDT1	0.06	0.08
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.14	0.18
tblVehicleEF	LDT1	0.15	0.26
tblVehicleEF	LDT1	7.3430e-003	0.01
tblVehicleEF	LDT1	8.3290e-003	0.01
tblVehicleEF	LDT1	0.99	1.47
tblVehicleEF	LDT1	1.67	2.62
tblVehicleEF	LDT1	307.35	352.76
tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.07	0.12
tblVehicleEF	LDT1	0.10	0.17
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003

tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.17	0.23
tblVehicleEF	LDT1	0.22	0.30
tblVehicleEF	LDT1	0.13	0.17
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.11	0.19
tblVehicleEF	LDT1	3.0840e-003	3.5450e-003
tblVehicleEF	LDT1	6.9000e-004	7.8700e-004
tblVehicleEF	LDT1	0.17	0.23
tblVehicleEF	LDT1	0.22	0.30
tblVehicleEF	LDT1	0.13	0.17
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.12	0.21
tblVehicleEF	LDT1	6.5190e-003	0.01
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.85	1.27
tblVehicleEF	LDT1	2.53	4.00
tblVehicleEF	LDT1	283.23	325.17
tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.09	0.15
tblVehicleEF	LDT1	0.13	0.21
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003
tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.21	0.29
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.17	0.22
tblVehicleEF	LDT1	0.16	0.27

tblVehicleEF	LDT1	2.8410e-003	3.2670e-003
tblVehicleEF	LDT1	7.0500e-004	8.1100e-004
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.21	0.29
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.17	0.22
tblVehicleEF	LDT1	0.17	0.29
tblVehicleEF	LDT2	4.4670e-003	6.2630e-003
tblVehicleEF	LDT2	5.7230e-003	9.2100e-003
tblVehicleEF	LDT2	0.62	0.78
tblVehicleEF	LDT2	1.31	1.91
tblVehicleEF	LDT2	322.78	373.37
tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.09	0.16
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	3.2320e-003	3.7390e-003
tblVehicleEF	LDT2	7.6400e-004	8.7900e-004
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.08	0.14

tblVehicleEF	LDT2	4.9670e-003	6.9560e-003
tblVehicleEF	LDT2	4.7180e-003	7.5690e-003
tblVehicleEF	LDT2	0.72	0.91
tblVehicleEF	LDT2	1.03	1.49
tblVehicleEF	LDT2	347.35	401.90
tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.08	0.14
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.08
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.06	0.10
tblVehicleEF	LDT2	3.4790e-003	4.0260e-003
tblVehicleEF	LDT2	7.5900e-004	8.7100e-004
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	4.3560e-003	6.1220e-003
tblVehicleEF	LDT2	6.4640e-003	0.01
tblVehicleEF	LDT2	0.61	0.77
tblVehicleEF	LDT2	1.53	2.23
tblVehicleEF	LDT2	319.83	369.93
tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.07	0.10

tblVehicleEF	LDT2	0.10	0.17
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.08	0.09
tblVehicleEF	LDT2	0.09	0.14
tblVehicleEF	LDT2	3.2020e-003	3.7050e-003
tblVehicleEF	LDT2	7.6800e-004	8.8400e-004
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.08	0.09
tblVehicleEF	LDT2	0.10	0.15
tblVehicleEF	LHD1	5.0010e-003	6.0100e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
tblVehicleEF	LHD1	0.98	1.32
tblVehicleEF	LHD1	2.37	3.04
tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.19	1.63
tblVehicleEF	LHD1	0.93	1.10
tblVehicleEF	LHD1	9.0300e-004	9.0900e-004
tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02

tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
tblVehicleEF	LHD1	8.6400e-004	8.7000e-004
tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	2.2490e-003	2.5080e-003
tblVehicleEF	LHD1	0.10	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.2490e-003	1.3230e-003
tblVehicleEF	LHD1	0.12	0.14
tblVehicleEF	LHD1	0.31	0.32
tblVehicleEF	LHD1	0.24	0.31
tblVehicleEF	LHD1	6.6740e-003	6.9910e-003
tblVehicleEF	LHD1	3.5100e-004	3.9200e-004
tblVehicleEF	LHD1	2.2490e-003	2.5080e-003
tblVehicleEF	LHD1	0.10	0.11
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.2490e-003	1.3230e-003
tblVehicleEF	LHD1	0.15	0.18
tblVehicleEF	LHD1	0.31	0.32
tblVehicleEF	LHD1	0.26	0.34
tblVehicleEF	LHD1	5.0010e-003	6.0100e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
tblVehicleEF	LHD1	1.00	1.35
tblVehicleEF	LHD1	2.18	2.79
tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.14	1.56
tblVehicleEF	LHD1	0.87	1.02
tblVehicleEF	LHD1	9.0300e-004	9.0900e-004

tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
tblVehicleEF	LHD1	8.6400e-004	8.7000e-004
tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	5.2840e-003	6.0230e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.6100e-003	2.8770e-003
tblVehicleEF	LHD1	0.12	0.14
tblVehicleEF	LHD1	0.30	0.31
tblVehicleEF	LHD1	0.22	0.29
tblVehicleEF	LHD1	6.6740e-003	6.9910e-003
tblVehicleEF	LHD1	3.4800e-004	3.8800e-004
tblVehicleEF	LHD1	5.2840e-003	6.0230e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.6100e-003	2.8770e-003
tblVehicleEF	LHD1	0.15	0.18
tblVehicleEF	LHD1	0.30	0.31
tblVehicleEF	LHD1	0.24	0.32
tblVehicleEF	LHD1	5.0010e-003	6.0100e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
tblVehicleEF	LHD1	0.97	1.30
tblVehicleEF	LHD1	2.55	3.27
tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.22	1.67

tblVehicleEF	LHD1	0.99	1.17
tblVehicleEF	LHD1	9.0300e-004	9.0900e-004
tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
tblVehicleEF	LHD1	8.6400e-004	8.7000e-004
tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	1.0100e-003	1.0710e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.9800e-004	6.1100e-004
tblVehicleEF	LHD1	0.12	0.14
tblVehicleEF	LHD1	0.35	0.36
tblVehicleEF	LHD1	0.25	0.33
tblVehicleEF	LHD1	6.6740e-003	6.9900e-003
tblVehicleEF	LHD1	3.5400e-004	3.9600e-004
tblVehicleEF	LHD1	1.0100e-003	1.0710e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	5.9800e-004	6.1100e-004
tblVehicleEF	LHD1	0.15	0.17
tblVehicleEF	LHD1	0.35	0.36
tblVehicleEF	LHD1	0.27	0.36
tblVehicleEF	LHD2	3.2340e-003	4.0830e-003
tblVehicleEF	LHD2	7.0930e-003	0.01
tblVehicleEF	LHD2	6.0220e-003	0.01
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.54	0.70
tblVehicleEF	LHD2	1.10	1.49
tblVehicleEF	LHD2	13.94	14.11
tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003

tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.65	1.17
tblVehicleEF	LHD2	0.42	0.58
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
tblVehicleEF	LHD2	6.7800e-004	9.6300e-004
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0400e-004	5.2500e-004
tblVehicleEF	LHD2	0.10	0.12
tblVehicleEF	LHD2	0.06	0.10
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
tblVehicleEF	LHD2	6.8280e-003	7.1210e-003
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tblVehicleEF	LHD2	6.7800e-004	9.6300e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.0400e-004	5.2500e-004
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.06	0.10
tblVehicleEF	LHD2	0.09	0.15
tblVehicleEF	LHD2	3.2340e-003	4.0830e-003
tblVehicleEF	LHD2	7.1900e-003	0.01
tblVehicleEF	LHD2	5.6920e-003	9.4580e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.54	0.71
tblVehicleEF	LHD2	1.02	1.37
tblVehicleEF	LHD2	13.94	14.11

tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.62	1.13
tblVehicleEF	LHD2	0.40	0.54
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
tblVehicleEF	LHD2	1.5810e-003	2.3000e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	8.3900e-004	1.1340e-003
tblVehicleEF	LHD2	0.10	0.12
tblVehicleEF	LHD2	0.06	0.09
tblVehicleEF	LHD2	0.08	0.13
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
tblVehicleEF	LHD2	6.8280e-003	7.1210e-003
tblVehicleEF	LHD2	2.5600e-004	2.8500e-004
tblVehicleEF	LHD2	1.5810e-003	2.3000e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.3900e-004	1.1340e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.06	0.09
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	3.2340e-003	4.0830e-003
tblVehicleEF	LHD2	7.0200e-003	0.01
tblVehicleEF	LHD2	6.2950e-003	0.01
tblVehicleEF	LHD2	0.12	0.13

tblVehicleEF	LHD2	0.54	0.69
tblVehicleEF	LHD2	1.17	1.59
tblVehicleEF	LHD2	13.94	14.11
tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.66	1.20
tblVehicleEF	LHD2	0.44	0.62
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
tblVehicleEF	LHD2	3.2300e-004	4.2900e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	1.9700e-004	2.4700e-004
tblVehicleEF	LHD2	0.10	0.12
tblVehicleEF	LHD2	0.07	0.11
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
tblVehicleEF	LHD2	6.8280e-003	7.1200e-003
tblVehicleEF	LHD2	2.5900e-004	2.8900e-004
tblVehicleEF	LHD2	3.2300e-004	4.2900e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.9700e-004	2.4700e-004
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.07	0.11
tblVehicleEF	LHD2	0.09	0.16
tblVehicleEF	MCY	0.46	0.45

tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	19.35	20.92
tblVehicleEF	MCY	10.27	10.18
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.16	1.17
tblVehicleEF	MCY	0.32	0.32
tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	0.82	0.83
tblVehicleEF	MCY	0.70	0.77
tblVehicleEF	MCY	0.47	0.49
tblVehicleEF	MCY	2.28	2.38
tblVehicleEF	MCY	0.59	0.67
tblVehicleEF	MCY	2.22	2.29
tblVehicleEF	MCY	2.1250e-003	2.1330e-003
tblVehicleEF	MCY	6.8500e-004	7.0200e-004
tblVehicleEF	MCY	0.82	0.83
tblVehicleEF	MCY	0.70	0.77
tblVehicleEF	MCY	0.47	0.49
tblVehicleEF	MCY	2.83	2.91
tblVehicleEF	MCY	0.59	0.67
tblVehicleEF	MCY	2.42	2.49
tblVehicleEF	MCY	0.45	0.43
tblVehicleEF	MCY	0.14	0.14
tblVehicleEF	MCY	18.43	19.84
tblVehicleEF	MCY	8.92	8.91
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.02	1.03
tblVehicleEF	MCY	0.29	0.29

tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	2.26	2.31
tblVehicleEF	MCY	0.92	0.98
tblVehicleEF	MCY	1.34	1.41
tblVehicleEF	MCY	2.19	2.27
tblVehicleEF	MCY	0.55	0.63
tblVehicleEF	MCY	1.85	1.89
tblVehicleEF	MCY	2.1080e-003	2.1130e-003
tblVehicleEF	MCY	6.5100e-004	6.6900e-004
tblVehicleEF	MCY	2.26	2.31
tblVehicleEF	MCY	0.92	0.98
tblVehicleEF	MCY	1.34	1.41
tblVehicleEF	MCY	2.72	2.79
tblVehicleEF	MCY	0.55	0.63
tblVehicleEF	MCY	2.01	2.06
tblVehicleEF	MCY	0.48	0.47
tblVehicleEF	MCY	0.19	0.20
tblVehicleEF	MCY	20.90	22.72
tblVehicleEF	MCY	11.71	11.58
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.24	1.26
tblVehicleEF	MCY	0.34	0.34
tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	0.27	0.27
tblVehicleEF	MCY	0.84	0.93
tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	2.37	2.49

tblVehicleEF	MCY	0.70	0.79
tblVehicleEF	MCY	2.57	2.67
tblVehicleEF	MCY	2.1530e-003	2.1650e-003
tblVehicleEF	MCY	7.1900e-004	7.3600e-004
tblVehicleEF	MCY	0.27	0.27
tblVehicleEF	MCY	0.84	0.93
tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	2.94	3.05
tblVehicleEF	MCY	0.70	0.79
tblVehicleEF	MCY	2.80	2.90
tblVehicleEF	MDV	8.0870e-003	0.01
tblVehicleEF	MDV	0.01	0.02
tblVehicleEF	MDV	0.92	1.37
tblVehicleEF	MDV	2.44	3.60
tblVehicleEF	MDV	435.22	495.13
tblVehicleEF	MDV	98.68	110.40
tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.11	0.18
tblVehicleEF	MDV	0.21	0.33
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.16	0.18
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.10	0.11
tblVehicleEF	MDV	0.18	0.28
tblVehicleEF	MDV	4.3550e-003	4.9610e-003
tblVehicleEF	MDV	1.0290e-003	1.1680e-003
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.16	0.18
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.03	0.05

tblVehicleEF	MDV	0.10	0.11
tblVehicleEF	MDV	0.20	0.31
tblVehicleEF	MDV	8.9890e-003	0.01
tblVehicleEF	MDV	0.01	0.02
tblVehicleEF	MDV	1.07	1.58
tblVehicleEF	MDV	1.90	2.82
tblVehicleEF	MDV	467.67	532.29
tblVehicleEF	MDV	98.68	110.40
tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.10	0.16
tblVehicleEF	MDV	0.18	0.29
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.13	0.14
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.11	0.12
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.15	0.23
tblVehicleEF	MDV	4.6820e-003	5.3360e-003
tblVehicleEF	MDV	1.0200e-003	1.1540e-003
tblVehicleEF	MDV	0.13	0.14
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.11	0.12
tblVehicleEF	MDV	0.03	0.05
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.16	0.25
tblVehicleEF	MDV	7.9010e-003	0.01
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.91	1.38
tblVehicleEF	MDV	2.85	4.21
tblVehicleEF	MDV	431.24	490.55
tblVehicleEF	MDV	98.68	110.40

tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.12	0.19
tblVehicleEF	MDV	0.23	0.35
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.16	0.19
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.12	0.13
tblVehicleEF	MDV	0.20	0.32
tblVehicleEF	MDV	4.3150e-003	4.9160e-003
tblVehicleEF	MDV	1.0370e-003	1.1790e-003
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.16	0.19
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.03	0.05
tblVehicleEF	MDV	0.12	0.13
tblVehicleEF	MDV	0.22	0.35
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.57	3.51
tblVehicleEF	MH	5.10	7.25
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
tblVehicleEF	MH	7.3200e-004	8.1200e-004
tblVehicleEF	MH	1.21	1.60
tblVehicleEF	MH	0.77	0.96
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03

tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	0.65	0.94
tblVehicleEF	MH	0.06	0.09
tblVehicleEF	MH	0.25	0.34
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.29	0.44
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7100e-004	7.4500e-004
tblVehicleEF	MH	0.65	0.94
tblVehicleEF	MH	0.06	0.09
tblVehicleEF	MH	0.25	0.34
tblVehicleEF	MH	0.11	0.20
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.32	0.48
tblVehicleEF	MH	0.02	0.05
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.64	3.63
tblVehicleEF	MH	4.61	6.56
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
tblVehicleEF	MH	7.3200e-004	8.1200e-004
tblVehicleEF	MH	1.14	1.50
tblVehicleEF	MH	0.71	0.89
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	1.55	2.28
tblVehicleEF	MH	0.07	0.09
tblVehicleEF	MH	0.53	0.76
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02

tblVehicleEF	MH	0.27	0.40
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.6200e-004	7.3300e-004
tblVehicleEF	MH	1.55	2.28
tblVehicleEF	MH	0.07	0.09
tblVehicleEF	MH	0.53	0.76
tblVehicleEF	MH	0.11	0.21
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.30	0.44
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.52	3.46
tblVehicleEF	MH	5.53	7.91
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
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tblVehicleEF	MH	1.25	1.66
tblVehicleEF	MH	0.81	1.02
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	0.28	0.37
tblVehicleEF	MH	0.07	0.10
tblVehicleEF	MH	0.12	0.15
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.31	0.46
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7800e-004	7.5600e-004
tblVehicleEF	MH	0.28	0.37
tblVehicleEF	MH	0.07	0.10
tblVehicleEF	MH	0.12	0.15

tblVehicleEF	MH	0.10	0.20
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.34	0.51
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	3.7750e-003	9.9170e-003
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tblVehicleEF	MHD	0.33	0.44
tblVehicleEF	MHD	0.32	0.64
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tblVehicleEF	MHD	148.90	151.53
tblVehicleEF	MHD	1,183.15	1,207.41
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tblVehicleEF	MHD	0.41	0.97
tblVehicleEF	MHD	1.10	2.26
tblVehicleEF	MHD	11.49	11.36
tblVehicleEF	MHD	1.2000e-004	3.0950e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	1.1500e-004	2.9610e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
tblVehicleEF	MHD	7.1400e-004	1.0180e-003
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	4.1300e-004	5.3600e-004
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.29	0.44
tblVehicleEF	MHD	1.4320e-003	1.4570e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.2300e-004	7.0200e-004
tblVehicleEF	MHD	7.1400e-004	1.0180e-003
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.03	0.04

tblVehicleEF	MHD	4.1300e-004	5.3600e-004
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.32	0.48
tblVehicleEF	MHD	0.01	0.02
tblVehicleEF	MHD	3.8500e-003	0.01
tblVehicleEF	MHD	0.04	0.06
tblVehicleEF	MHD	0.23	0.31
tblVehicleEF	MHD	0.32	0.66
tblVehicleEF	MHD	4.49	6.78
tblVehicleEF	MHD	157.87	160.66
tblVehicleEF	MHD	1,183.15	1,207.41
tblVehicleEF	MHD	53.72	57.19
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.43	1.00
tblVehicleEF	MHD	1.06	2.17
tblVehicleEF	MHD	11.44	11.28
tblVehicleEF	MHD	1.0100e-004	2.6090e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	9.7000e-005	2.4960e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
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tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	8.9500e-004	1.2420e-003
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.28	0.41
tblVehicleEF	MHD	1.5160e-003	1.5430e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.1600e-004	6.9100e-004
tblVehicleEF	MHD	1.7020e-003	2.5140e-003
tblVehicleEF	MHD	0.04	0.05

tblVehicleEF	MHD	0.03	0.04
tblVehicleEF	MHD	8.9500e-004	1.2420e-003
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.30	0.45
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	3.7230e-003	9.7820e-003
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tblVehicleEF	MHD	0.44	0.58
tblVehicleEF	MHD	0.31	0.64
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tblVehicleEF	MHD	136.85	139.26
tblVehicleEF	MHD	1,183.15	1,207.41
tblVehicleEF	MHD	53.72	57.19
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.39	0.92
tblVehicleEF	MHD	1.12	2.30
tblVehicleEF	MHD	11.53	11.42
tblVehicleEF	MHD	1.4600e-004	3.7660e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	1.4000e-004	3.6030e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
tblVehicleEF	MHD	3.2900e-004	4.2600e-004
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.02	0.04
tblVehicleEF	MHD	1.9300e-004	2.3400e-004
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	0.31	0.47
tblVehicleEF	MHD	1.3180e-003	1.3420e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.2900e-004	7.1200e-004
tblVehicleEF	MHD	3.2900e-004	4.2600e-004

tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.03	0.05
tblVehicleEF	MHD	1.9300e-004	2.3400e-004
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	0.34	0.51
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tblVehicleEF	OBUS	0.03	0.03
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tblVehicleEF	OBUS	0.45	0.74
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tblVehicleEF	OBUS	1,295.29	1,327.27
tblVehicleEF	OBUS	65.39	66.62
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tblVehicleEF	OBUS	0.97	2.45
tblVehicleEF	OBUS	3.12	3.35
tblVehicleEF	OBUS	2.3000e-005	3.6800e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	2.2000e-005	3.5200e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	1.1060e-003	1.1640e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	5.2600e-004	5.3400e-004
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.31	0.39
tblVehicleEF	OBUS	1.1280e-003	1.2180e-003
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4300e-004	7.7700e-004

tblVehicleEF	OBUS	1.1060e-003	1.1640e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	5.2600e-004	5.3400e-004
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.34	0.43
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.4610e-003	0.01
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.24	0.27
tblVehicleEF	OBUS	0.46	0.76
tblVehicleEF	OBUS	4.61	5.72
tblVehicleEF	OBUS	123.04	133.00
tblVehicleEF	OBUS	1,295.29	1,327.27
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tblVehicleEF	OBUS	2.6490e-003	2.5450e-003
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tblVehicleEF	OBUS	0.92	2.34
tblVehicleEF	OBUS	3.06	3.28
tblVehicleEF	OBUS	2.0000e-005	3.1000e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	1.9000e-005	2.9600e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	2.5230e-003	2.7110e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	1.1140e-003	1.1710e-003
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.29	0.37
tblVehicleEF	OBUS	1.1850e-003	1.2810e-003
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.3500e-004	7.6700e-004
tblVehicleEF	OBUS	2.5230e-003	2.7110e-003
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tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	1.1140e-003	1.1710e-003
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.32	0.40
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.1590e-003	0.01
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tblVehicleEF	OBUS	0.44	0.73
tblVehicleEF	OBUS	5.46	6.77
tblVehicleEF	OBUS	108.75	117.42
tblVehicleEF	OBUS	1,295.29	1,327.27
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tblVehicleEF	OBUS	2.6490e-003	2.5450e-003
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tblVehicleEF	OBUS	0.99	2.49
tblVehicleEF	OBUS	3.17	3.42
tblVehicleEF	OBUS	2.8000e-005	4.4700e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	2.7000e-005	4.2800e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	5.7500e-004	5.7700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	2.6000e-004	2.5700e-004
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.33	0.41
tblVehicleEF	OBUS	1.0490e-003	1.1320e-003

tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4900e-004	7.8500e-004
tblVehicleEF	OBUS	5.7500e-004	5.7700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	2.6000e-004	2.5700e-004
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.36	0.45
tblVehicleEF	SBUS	0.83	0.88
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.07	0.09
tblVehicleEF	SBUS	5.84	5.40
tblVehicleEF	SBUS	0.65	0.87
tblVehicleEF	SBUS	5.74	6.36
tblVehicleEF	SBUS	1,231.71	1,288.91
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	9.96	13.15
tblVehicleEF	SBUS	3.91	5.51
tblVehicleEF	SBUS	14.73	15.68
tblVehicleEF	SBUS	8.9310e-003	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	8.5440e-003	0.01
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	1.8160e-003	1.9710e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.69	0.65
tblVehicleEF	SBUS	8.6000e-004	8.0700e-004
tblVehicleEF	SBUS	0.10	0.13

tblVehicleEF	SBUS	8.8680e-003	0.01
tblVehicleEF	SBUS	0.29	0.32
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8300e-004	4.4600e-004
tblVehicleEF	SBUS	1.8160e-003	1.9710e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	1.00	0.93
tblVehicleEF	SBUS	8.6000e-004	8.0700e-004
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	8.8680e-003	0.01
tblVehicleEF	SBUS	0.31	0.34
tblVehicleEF	SBUS	0.83	0.88
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.06	0.07
tblVehicleEF	SBUS	5.72	5.24
tblVehicleEF	SBUS	0.66	0.89
tblVehicleEF	SBUS	4.21	4.66
tblVehicleEF	SBUS	1,293.63	1,355.64
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	10.28	13.58
tblVehicleEF	SBUS	3.75	5.29
tblVehicleEF	SBUS	14.70	15.64
tblVehicleEF	SBUS	7.5280e-003	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	7.2030e-003	0.01
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	4.0820e-003	4.5750e-003
tblVehicleEF	SBUS	0.02	0.02

tblVehicleEF	SBUS	0.69	0.65
tblVehicleEF	SBUS	1.8080e-003	1.7980e-003
tblVehicleEF	SBUS	0.10	0.13
tblVehicleEF	SBUS	7.5760e-003	9.4490e-003
tblVehicleEF	SBUS	0.24	0.26
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.5700e-004	4.1700e-004
tblVehicleEF	SBUS	4.0820e-003	4.5750e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.99	0.93
tblVehicleEF	SBUS	1.8080e-003	1.7980e-003
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	7.5760e-003	9.4490e-003
tblVehicleEF	SBUS	0.26	0.29
tblVehicleEF	SBUS	0.84	0.89
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.10
tblVehicleEF	SBUS	6.01	5.63
tblVehicleEF	SBUS	0.64	0.85
tblVehicleEF	SBUS	7.17	7.95
tblVehicleEF	SBUS	1,146.20	1,196.76
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	9.52	12.57
tblVehicleEF	SBUS	3.98	5.61
tblVehicleEF	SBUS	14.75	15.71
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03

tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	9.6700e-004	9.4300e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.70	0.66
tblVehicleEF	SBUS	4.3200e-004	3.9300e-004
tblVehicleEF	SBUS	0.10	0.13
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.32	0.36
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	5.0700e-004	4.7200e-004
tblVehicleEF	SBUS	9.6700e-004	9.4300e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	1.00	0.94
tblVehicleEF	SBUS	4.3200e-004	3.9300e-004
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.35	0.39
tblVehicleEF	UBUS	0.28	0.30
tblVehicleEF	UBUS	0.05	0.05
tblVehicleEF	UBUS	5.17	6.15
tblVehicleEF	UBUS	8.35	8.31
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	10.13	13.34
tblVehicleEF	UBUS	14.91	16.06
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	2.7420e-003	2.6490e-003
tblVehicleEF	UBUS	0.05	0.06

tblVehicleEF	UBUS	1.4690e-003	1.3090e-003
tblVehicleEF	UBUS	0.60	0.81
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.65	0.61
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1690e-003	1.0030e-003
tblVehicleEF	UBUS	2.7420e-003	2.6490e-003
tblVehicleEF	UBUS	0.05	0.06
tblVehicleEF	UBUS	1.4690e-003	1.3090e-003
tblVehicleEF	UBUS	0.93	1.18
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.71	0.66
tblVehicleEF	UBUS	0.28	0.30
tblVehicleEF	UBUS	0.04	0.04
tblVehicleEF	UBUS	5.22	6.22
tblVehicleEF	UBUS	6.59	6.51
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	9.70	12.78
tblVehicleEF	UBUS	14.83	15.98
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	6.5140e-003	6.4350e-003
tblVehicleEF	UBUS	0.06	0.06
tblVehicleEF	UBUS	3.1610e-003	2.9500e-003
tblVehicleEF	UBUS	0.61	0.82
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.56	0.52
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1380e-003	9.7200e-004

tblVehicleEF	UBUS	6.5140e-003	6.4350e-003
tblVehicleEF	UBUS	0.06	0.06
tblVehicleEF	UBUS	3.1610e-003	2.9500e-003
tblVehicleEF	UBUS	0.94	1.20
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.62	0.57
tblVehicleEF	UBUS	0.27	0.30
tblVehicleEF	UBUS	0.05	0.05
tblVehicleEF	UBUS	5.13	6.10
tblVehicleEF	UBUS	9.93	9.94
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	10.29	13.55
tblVehicleEF	UBUS	14.97	16.12
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	1.2450e-003	1.1230e-003
tblVehicleEF	UBUS	0.06	0.07
tblVehicleEF	UBUS	6.7200e-004	5.5800e-004
tblVehicleEF	UBUS	0.60	0.81
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.72	0.68
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1960e-003	1.0310e-003
tblVehicleEF	UBUS	1.2450e-003	1.1230e-003
tblVehicleEF	UBUS	0.06	0.07
tblVehicleEF	UBUS	6.7200e-004	5.5800e-004
tblVehicleEF	UBUS	0.92	1.17
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.79	0.74

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	4.1464	40.6058	28.0954	0.0538	0.4447	2.1159	2.5607	0.0971	2.0046	2.1017	0.0000	5,304.5787	5,304.5787	1.1558	0.0000	5,333.4726
2019	9.6312	95.6437	72.9629	0.1454	0.9798	4.7098	5.6896	0.2182	4.4466	4.6648	0.0000	14,222.5155	14,222.5155	3.3275	0.0000	14,305.7038
2020	18.6773	184.4517	152.5121	0.3047	1.8957	8.8560	10.7517	0.4476	8.3601	8.8077	0.0000	29,362.3685	29,362.3685	6.8431	0.0000	29,533.4465
2021	3.1397	30.7108	26.8294	0.0546	0.4911	1.4320	1.9231	0.1021	1.3546	1.4567	0.0000	5,256.4808	5,256.4808	1.1521	0.0000	5,285.2828
2022	1.8163	17.4848	14.7550	0.0336	0.6072	0.7707	1.3780	0.1121	0.7326	0.8447	0.0000	3,229.2705	3,229.2705	0.6175	0.0000	3,244.7081
Maximum	**18.6773**	**184.4517**	**152.5121**	**0.3047**	**1.8957**	**8.8560**	**10.7517**	**0.4476**	**8.3601**	**8.8077**	**0.0000**	**29,362.3685**	**29,362.3685**	**6.8431**	**0.0000**	**29,533.4465**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.7792	4.1024	31.7128	0.0538	0.4447	0.0137	0.4584	0.0971	0.0135	0.1106	0.0000	5,304.5787	5,304.5787	1.1558	0.0000	5,333.4726
2019	2.0458	11.3239	86.0925	0.1454	0.9798	0.0368	1.0166	0.2182	0.0365	0.2546	0.0000	14,222.5155	14,222.5155	3.3275	0.0000	14,305.7038
2020	4.2528	24.0604	180.9720	0.3047	1.8957	0.0771	1.9728	0.4476	0.0764	0.5239	0.0000	29,362.3685	29,362.3685	6.8431	0.0000	29,533.4464
2021	0.7577	4.2335	31.9255	0.0546	0.4911	0.0138	0.5049	0.1021	0.0137	0.1158	0.0000	5,256.4807	5,256.4807	1.1521	0.0000	5,285.2828
2022	0.4747	2.2694	17.9354	0.0336	0.6072	8.7800e-003	0.6160	0.1121	8.6400e-003	0.1207	0.0000	3,229.2705	3,229.2705	0.6175	0.0000	3,244.7081
Maximum	**4.2528**	**24.0604**	**180.9720**	**0.3047**	**1.8957**	**0.0771**	**1.9728**	**0.4476**	**0.0764**	**0.5239**	**0.0000**	**29,362.3685**	**29,362.3685**	**6.8431**	**0.0000**	**29,533.4464**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**77.79**	**87.53**	**-18.12**	**0.00**	**0.00**	**99.16**	**79.51**	**0.00**	**99.12**	**93.70**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.6000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**9.6000e-004**	**9.0000e-005**	**0.0102**	**0.0000**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**	**0.0000**	**0.0233**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	9.6000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**9.6000e-004**	**9.0000e-005**	**0.0102**	**0.0000**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**	**0.0000**	**0.0233**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation1	Site Preparation	10/26/2018	4/19/2019	5	126	Increase Soscol WRF Filter Capacity
2	Site Preparation2	Site Preparation	12/3/2018	4/9/2019	5	92	Recycled Water Distribution System Expansion – Phase 1
3	Site Preparation3	Site Preparation	4/20/2019	10/14/2019	5	126	Increase ECWRF Capacity
4	Site Preparation4	Site Preparation	10/15/2019	5/27/2021	5	423	Urban Recycled Water Expansion
5	Site Preparation5	Site Preparation	11/11/2019	7/13/2020	5	176	Agricultural Recycled Water Expansion – Phases 1 and 2
6	Site Preparation6	Site Preparation	12/2/2019	4/24/2020	5	105	Recycled Water Distribution System Expansion – Phase 2
7	Site Preparation7	Site Preparation	12/30/2019	6/19/2020	5	168	Soscol WRF Covered Storage
8	Site Preparation8	Site Preparation	1/6/2020	1/17/2020	5	10	Turnout to Wetlands
9	Site Preparation9	Site Preparation	1/6/2020	6/12/2020	5	115	Napa Road Pipeline
10	Site Preparation10	Site Preparation	1/6/2020	6/29/2020	5	126	Recycled Water Distribution System Expansion to San Quentin Prison
11	Site Preparation11	Site Preparation	1/6/2020	1/20/2020	5	11	Recycled Water Distribution System Expansion to San Quentin
12	Site Preparation12	Site Preparation	1/6/2020	1/13/2020	5	6	Soscol WRF Covered Storage - Pipeline
13	Site Preparation13	Site Preparation	5/28/2021	8/17/2021	5	58	Marin County Lower Novato Creek - Distribution
14	Site Preparation14	Site Preparation	11/1/2021	4/25/2022	5	126	WRF Phase 2 Treatment Plant Upgrades
15	Site Preparation15	Site Preparation	11/1/2021	11/15/2021	5	11	WRF Phase 2 Treatment Plant Upgrades - Pipelines
16	Site Preparation16	Site Preparation	2/7/2022	6/2/2022	5	84	RWTF Treatment Capacity Expansion

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation1	Cranes	1	4.50	231	0.29
Site Preparation1	Forklifts	1	4.50	89	0.20
Site Preparation1	Generator Sets	1	8.00	84	0.74
Site Preparation1	Graders	1	2.00	187	0.41
Site Preparation1	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation1	Rubber Tired Loaders	1	2.00	203	0.36
Site Preparation1	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Site Preparation2	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation2	Cranes	1	6.00	231	0.29
Site Preparation2	Excavators	1	8.00	158	0.38
Site Preparation2	Generator Sets	1	8.00	84	0.74
Site Preparation2	Pavers	1	6.00	130	0.42
Site Preparation2	Rollers	1	6.00	80	0.38
Site Preparation2	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation2	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation3	Cranes	1	4.00	231	0.29
Site Preparation3	Forklifts	1	4.00	89	0.20
Site Preparation3	Generator Sets	1	8.00	84	0.74
Site Preparation3	Graders	1	2.70	187	0.41
Site Preparation3	Off-Highway Trucks	1	0.20	402	0.38
Site Preparation3	Rubber Tired Loaders	1	2.70	203	0.36
Site Preparation3	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Site Preparation4	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation4	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation4	Cranes	1	6.10	231	0.29
Site Preparation4	Excavators	1	9.20	158	0.38
Site Preparation4	Generator Sets	1	8.00	84	0.74
Site Preparation4	Pavers	1	6.00	130	0.42
Site Preparation4	Rollers	1	6.10	80	0.38
Site Preparation4	Rubber Tired Loaders	1	9.20	203	0.36
Site Preparation4	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation5	Bore/Drill Rigs	1	0.10	221	0.50
Site Preparation5	Concrete/Industrial Saws	1	6.00	81	0.73

Site Preparation5	Cranes	1	6.00	231	0.29
Site Preparation5	Excavators	1	8.40	158	0.38
Site Preparation5	Generator Sets	1	8.00	84	0.74
Site Preparation5	Pavers	1	6.00	130	0.42
Site Preparation5	Rollers	1	6.00	80	0.38
Site Preparation5	Rubber Tired Loaders	1	8.40	203	0.36
Site Preparation5	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation6	Bore/Drill Rigs	1	0.80	221	0.50
Site Preparation6	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation6	Cranes	1	6.30	231	0.29
Site Preparation6	Excavators	1	11.00	158	0.38
Site Preparation6	Generator Sets	1	8.00	84	0.74
Site Preparation6	Pavers	1	6.00	130	0.42
Site Preparation6	Rollers	1	6.30	80	0.38
Site Preparation6	Rubber Tired Loaders	1	11.00	203	0.36
Site Preparation6	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation7	Forklifts	1	3.00	89	0.20
Site Preparation7	Generator Sets	1	8.00	84	0.74
Site Preparation7	Graders	1	4.00	187	0.41
Site Preparation7	Off-Highway Trucks	1	4.00	402	0.38
Site Preparation7	Rollers	1	3.00	80	0.38
Site Preparation7	Rubber Tired Loaders	1	4.00	203	0.36
Site Preparation7	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation8	Concrete/Industrial Saws	0	0.00	81	0.73
Site Preparation8	Cranes	1	6.00	231	0.29
Site Preparation8	Excavators	1	8.00	158	0.38
Site Preparation8	Generator Sets	1	8.00	84	0.74
Site Preparation8	Pavers	0	0.00	130	0.42
Site Preparation8	Rollers	1	6.00	80	0.38
Site Preparation8	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation8	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation9	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation9	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation9	Cranes	1	6.10	231	0.29
Site Preparation9	Excavators	1	9.10	158	0.38

Site Preparation9	Generator Sets	1	8.00	84	0.74
Site Preparation9	Pavers	1	6.00	130	0.42
Site Preparation9	Rollers	1	6.10	80	0.38
Site Preparation9	Rubber Tired Loaders	1	9.10	203	0.36
Site Preparation9	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation10	Cranes	1	5.00	231	0.29
Site Preparation10	Forklifts	0	5.00	89	0.20
Site Preparation10	Generator Sets	1	8.00	84	0.74
Site Preparation10	Graders	1	1.30	187	0.41
Site Preparation10	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation10	Rubber Tired Loaders	1	1.30	203	0.36
Site Preparation10	Tractors/Loaders/Backhoes	1	1.30	97	0.37
Site Preparation11	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation11	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation11	Cranes	1	6.10	231	0.29
Site Preparation11	Excavators	1	9.10	158	0.38
Site Preparation11	Generator Sets	1	8.00	84	0.74
Site Preparation11	Pavers	1	6.00	130	0.42
Site Preparation11	Rollers	1	6.10	80	0.38
Site Preparation11	Rubber Tired Loaders	1	9.10	203	0.36
Site Preparation11	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation12	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation12	Cranes	1	6.00	231	0.29
Site Preparation12	Excavators	1	8.00	158	0.38
Site Preparation12	Generator Sets	1	8.00	84	0.74
Site Preparation12	Pavers	1	6.00	130	0.42
Site Preparation12	Rollers	1	6.00	80	0.38
Site Preparation12	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation12	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation13	Concrete/Industrial Saws	0	0.00	81	0.73
Site Preparation13	Cranes	1	6.00	231	0.29
Site Preparation13	Excavators	1	8.00	158	0.38
Site Preparation13	Generator Sets	1	8.00	84	0.74
Site Preparation13	Pavers	0	0.00	130	0.42
Site Preparation13	Rollers	1	6.00	80	0.38

Site Preparation13	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation13	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation14	Cranes	1	4.00	231	0.29
Site Preparation14	Forklifts	1	4.00	89	0.20
Site Preparation14	Generator Sets	1	8.00	84	0.74
Site Preparation14	Graders	1	2.70	187	0.41
Site Preparation14	Off-Highway Trucks	1	0.20	402	0.38
Site Preparation14	Rubber Tired Loaders	1	2.70	203	0.36
Site Preparation14	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Site Preparation15	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation15	Cranes	1	6.00	231	0.29
Site Preparation15	Excavators	1	8.00	158	0.38
Site Preparation15	Generator Sets	1	8.00	84	0.74
Site Preparation15	Pavers	1	6.00	130	0.42
Site Preparation15	Rollers	1	6.00	80	0.38
Site Preparation15	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation15	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation16	Cranes	1	4.50	231	0.29
Site Preparation16	Forklifts	1	4.50	89	0.20
Site Preparation16	Generator Sets	1	8.00	84	0.74
Site Preparation16	Graders	1	2.00	187	0.41
Site Preparation16	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation16	Rubber Tired Loaders	1	2.00	203	0.36
Site Preparation16	Tractors/Loaders/Backhoes	1	2.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation1	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation2	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation3	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation4	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation5	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation6	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation7	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation8	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation9	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation10	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation11	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation12	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation13	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation14	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation15	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation16	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

3.2 Site Preparation1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	1.2402	12.7103	7.3963	0.0149		0.6522	0.6522		0.6210	0.6210		1,455.6401	1,455.6401	0.3042		1,463.2438
Total	**1.2402**	**12.7103**	**7.3963**	**0.0149**	**0.1326**	**0.6522**	**0.7848**	**0.0143**	**0.6210**	**0.6353**		**1,455.6401**	**1,455.6401**	**0.3042**		**1,463.2438**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0758	0.0490	0.6030	1.5800e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		157.2415	157.2415	4.5900e-003		157.3563
Total	**0.0758**	**0.0490**	**0.6030**	**1.5800e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**157.2415**	**157.2415**	**4.5900e-003**		**157.3563**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	0.1753	1.0228	8.2841	0.0149		3.3500e-003	3.3500e-003		3.3500e-003	3.3500e-003	0.0000	1,455.6401	1,455.6401	0.3042		1,463.2438
Total	**0.1753**	**1.0228**	**8.2841**	**0.0149**	**0.1326**	**3.3500e-003**	**0.1359**	**0.0143**	**3.3500e-003**	**0.0177**	**0.0000**	**1,455.6401**	**1,455.6401**	**0.3042**		**1,463.2438**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0758	0.0490	0.6030	1.5800e-003	0.1479	1.0000e-003	0.1489	0.0392	9.2000e-004	0.0401		157.2415	157.2415	4.5900e-003		157.3563
Total	**0.0758**	**0.0490**	**0.6030**	**1.5800e-003**	**0.1479**	**1.0000e-003**	**0.1489**	**0.0392**	**9.2000e-004**	**0.0401**		**157.2415**	**157.2415**	**4.5900e-003**		**157.3563**

3.2 Site Preparation1 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	1.1059	11.4860	7.1895	0.0148		0.5668	0.5668		0.5396	0.5396		1,441.7985	1,441.7985	0.2985		1,449.2614
Total	**1.1059**	**11.4860**	**7.1895**	**0.0148**	**0.1326**	**0.5668**	**0.6994**	**0.0143**	**0.5396**	**0.5539**		**1,441.7985**	**1,441.7985**	**0.2985**		**1,449.2614**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	0.1753	1.0228	8.2841	0.0148		3.3500e-003	3.3500e-003		3.3500e-003	3.3500e-003	0.0000	1,441.7985	1,441.7985	0.2985		1,449.2614
Total	**0.1753**	**1.0228**	**8.2841**	**0.0148**	**0.1326**	**3.3500e-003**	**0.1359**	**0.0143**	**3.3500e-003**	**0.0177**	**0.0000**	**1,441.7985**	**1,441.7985**	**0.2985**		**1,449.2614**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

3.3 Site Preparation2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.7461	27.7921	19.4260	0.0356		1.4616	1.4616		1.3817	1.3817		3,516.9844	3,516.9844	0.8419		3,538.0322
Total	**2.7461**	**27.7921**	**19.4260**	**0.0356**	**0.0000**	**1.4616**	**1.4616**	**0.0000**	**1.3817**	**1.3817**		**3,516.9844**	**3,516.9844**	**0.8419**		**3,538.0322**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0843	0.0544	0.6701	1.7500e-003	0.1643	1.1100e-003	0.1654	0.0436	1.0200e-003	0.0446		174.7128	174.7128	5.1000e-003		174.8403
Total	**0.0843**	**0.0544**	**0.6701**	**1.7500e-003**	**0.1643**	**1.1100e-003**	**0.1654**	**0.0436**	**1.0200e-003**	**0.0446**		**174.7128**	**174.7128**	**5.1000e-003**		**174.8403**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4438	2.9762	22.1556	0.0356		8.2400e-003	8.2400e-003		8.2400e-003	8.2400e-003	0.0000	3,516.9844	3,516.9844	0.8419		3,538.0322
Total	**0.4438**	**2.9762**	**22.1556**	**0.0356**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**3,516.9844**	**3,516.9844**	**0.8419**		**3,538.0322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0843	0.0544	0.6701	1.7500e-003	0.1643	1.1100e-003	0.1654	0.0436	1.0200e-003	0.0446		174.7128	174.7128	5.1000e-003		174.8403
Total	**0.0843**	**0.0544**	**0.6701**	**1.7500e-003**	**0.1643**	**1.1100e-003**	**0.1654**	**0.0436**	**1.0200e-003**	**0.0446**		**174.7128**	**174.7128**	**5.1000e-003**		**174.8403**

3.3 Site Preparation2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.4465	24.8443	19.0709	0.0356		1.2613	1.2613		1.1923	1.1923		3,477.3012	3,477.3012	0.8332		3,498.1307
Total	**2.4465**	**24.8443**	**19.0709**	**0.0356**	**0.0000**	**1.2613**	**1.2613**	**0.0000**	**1.1923**	**1.1923**		**3,477.3012**	**3,477.3012**	**0.8332**		**3,498.1307**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0761	0.0476	0.5964	1.7000e-003	0.1643	1.0900e-003	0.1654	0.0436	1.0000e-003	0.0446		169.4836	169.4836	4.5100e-003		169.5962
Total	**0.0761**	**0.0476**	**0.5964**	**1.7000e-003**	**0.1643**	**1.0900e-003**	**0.1654**	**0.0436**	**1.0000e-003**	**0.0446**		**169.4836**	**169.4836**	**4.5100e-003**		**169.5962**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4438	2.9762	22.1556	0.0356		8.2400e-003	8.2400e-003		8.2400e-003	8.2400e-003	0.0000	3,477.3012	3,477.3012	0.8332		3,498.1307
Total	**0.4438**	**2.9762**	**22.1556**	**0.0356**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**3,477.3012**	**3,477.3012**	**0.8332**		**3,498.1307**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0761	0.0476	0.5964	1.7000e-003	0.1643	1.0900e-003	0.1654	0.0436	1.0000e-003	0.0446		169.4836	169.4836	4.5100e-003		169.5962
Total	**0.0761**	**0.0476**	**0.5964**	**1.7000e-003**	**0.1643**	**1.0900e-003**	**0.1654**	**0.0436**	**1.0000e-003**	**0.0446**		**169.4836**	**169.4836**	**4.5100e-003**		**169.5962**

3.4 Site Preparation3 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	1.1712	12.3137	7.5307	0.0160		0.5936	0.5936		0.5642	0.5642		1,551.5848	1,551.5848	0.3333		1,559.9160
Total	**1.1712**	**12.3137**	**7.5307**	**0.0160**	**0.1789**	**0.5936**	**0.7725**	**0.0193**	**0.5642**	**0.5835**		**1,551.5848**	**1,551.5848**	**0.3333**		**1,559.9160**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	0.1917	1.1859	8.8365	0.0160		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	1,551.5848	1,551.5848	0.3333		1,559.9160
Total	**0.1917**	**1.1859**	**8.8365**	**0.0160**	**0.1789**	**3.6200e-003**	**0.1826**	**0.0193**	**3.6200e-003**	**0.0229**	**0.0000**	**1,551.5848**	**1,551.5848**	**0.3333**		**1,559.9160**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

3.5 Site Preparation4 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.5651	26.2120	19.9422	0.0378		1.3140	1.3140		1.2407	1.2407		3,691.9493	3,691.9493	0.9011		3,714.4766
Total	**2.5651**	**26.2120**	**19.9422**	**0.0378**	**0.0000**	**1.3140**	**1.3140**	**0.0000**	**1.2407**	**1.2407**		**3,691.9493**	**3,691.9493**	**0.9011**		**3,714.4766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4706	3.0923	23.3868	0.0378		8.7800e-003	8.7800e-003		8.7800e-003	8.7800e-003	0.0000	3,691.9493	3,691.9493	0.9011		3,714.4766
Total	**0.4706**	**3.0923**	**23.3868**	**0.0378**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**3,691.9493**	**3,691.9493**	**0.9011**		**3,714.4766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

3.5 Site Preparation4 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.3460	23.8410	19.6973	0.0378		1.1576	1.1576		1.0926	1.0926		3,634.7462	3,634.7462	0.8935		3,657.0845
Total	**2.3460**	**23.8410**	**19.6973**	**0.0378**	**0.0000**	**1.1576**	**1.1576**	**0.0000**	**1.0926**	**1.0926**		**3,634.7462**	**3,634.7462**	**0.8935**		**3,657.0845**

North Bay Water Reuse Program Phase 2 - San Francisco Bay Area Air Basin, Summer

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4706	3.0923	23.3868	0.0378		8.7800e-003	8.7800e-003		8.7800e-003	8.7800e-003	0.0000	3,634.7462	3,634.7462	0.8935		3,657.0844
Total	**0.4706**	**3.0923**	**23.3868**	**0.0378**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**3,634.7462**	**3,634.7462**	**0.8935**		**3,657.0844**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

3.5 Site Preparation4 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.1450	21.4846	19.5037	0.0378		1.0149	1.0149		0.9576	0.9576		3,634.9431	3,634.9431	0.8880		3,657.1420
Total	**2.1450**	**21.4846**	**19.5037**	**0.0378**	**0.0000**	**1.0149**	**1.0149**	**0.0000**	**0.9576**	**0.9576**		**3,634.9431**	**3,634.9431**	**0.8880**		**3,657.1420**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0740	0.0432	0.5650	1.8300e-003	0.1889	1.1900e-003	0.1901	0.0501	1.1000e-003	0.0512		182.1507	182.1507	4.0700e-003		182.2525
Total	**0.0740**	**0.0432**	**0.5650**	**1.8300e-003**	**0.1889**	**1.1900e-003**	**0.1901**	**0.0501**	**1.1000e-003**	**0.0512**		**182.1507**	**182.1507**	**4.0700e-003**		**182.2525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4706	3.0923	23.3868	0.0378		8.7800e-003	8.7800e-003		8.7800e-003	8.7800e-003	0.0000	3,634.9431	3,634.9431	0.8880		3,657.1420
Total	**0.4706**	**3.0923**	**23.3868**	**0.0378**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**8.7800e-003**	**8.7800e-003**	**0.0000**	**3,634.9431**	**3,634.9431**	**0.8880**		**3,657.1420**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0740	0.0432	0.5650	1.8300e-003	0.1889	1.1900e-003	0.1901	0.0501	1.1000e-003	0.0512		182.1507	182.1507	4.0700e-003		182.2525
Total	**0.0740**	**0.0432**	**0.5650**	**1.8300e-003**	**0.1889**	**1.1900e-003**	**0.1901**	**0.0501**	**1.1000e-003**	**0.0512**		**182.1507**	**182.1507**	**4.0700e-003**		**182.2525**

3.6 Site Preparation5 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.4830	25.2658	19.3438	0.0363		1.2772	1.2772		1.2069	1.2069		3,545.3885	3,545.3885	0.8547		3,566.7566
Total	**2.4830**	**25.2658**	**19.3438**	**0.0363**	**0.0000**	**1.2772**	**1.2772**	**0.0000**	**1.2069**	**1.2069**		**3,545.3885**	**3,545.3885**	**0.8547**		**3,566.7566**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4523	3.0130	22.5469	0.0363		8.4100e-003	8.4100e-003		8.4100e-003	8.4100e-003	0.0000	3,545.3885	3,545.3885	0.8547		3,566.7566
Total	**0.4523**	**3.0130**	**22.5469**	**0.0363**	**0.0000**	**8.4100e-003**	**8.4100e-003**	**0.0000**	**8.4100e-003**	**8.4100e-003**	**0.0000**	**3,545.3885**	**3,545.3885**	**0.8547**		**3,566.7566**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

3.6 Site Preparation5 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.2689	22.9773	19.1048	0.0363		1.1243	1.1243		1.0620	1.0620		3,491.3125	3,491.3125	0.8471		3,512.4910
Total	**2.2689**	**22.9773**	**19.1048**	**0.0363**	**0.0000**	**1.1243**	**1.1243**	**0.0000**	**1.0620**	**1.0620**		**3,491.3125**	**3,491.3125**	**0.8471**		**3,512.4910**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4523	3.0130	22.5469	0.0363		8.4100e-003	8.4100e-003		8.4100e-003	8.4100e-003	0.0000	3,491.3125	3,491.3125	0.8471		3,512.4910
Total	**0.4523**	**3.0130**	**22.5469**	**0.0363**	**0.0000**	**8.4100e-003**	**8.4100e-003**	**0.0000**	**8.4100e-003**	**8.4100e-003**	**0.0000**	**3,491.3125**	**3,491.3125**	**0.8471**		**3,512.4910**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

3.7 Site Preparation6 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.7492	28.3383	21.2884	0.0411		1.3961	1.3961		1.3162	1.3162		4,024.9099	4,024.9099	1.0064		4,050.0708
Total	**2.7492**	**28.3383**	**21.2884**	**0.0411**	**0.0000**	**1.3961**	**1.3961**	**0.0000**	**1.3162**	**1.3162**		**4,024.9099**	**4,024.9099**	**1.0064**		**4,050.0708**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5122	3.2725	25.2889	0.0411		9.6100e-003	9.6100e-003		9.6100e-003	9.6100e-003	0.0000	4,024.9099	4,024.9099	1.0064		4,050.0708
Total	**0.5122**	**3.2725**	**25.2889**	**0.0411**	**0.0000**	**9.6100e-003**	**9.6100e-003**	**0.0000**	**9.6100e-003**	**9.6100e-003**	**0.0000**	**4,024.9099**	**4,024.9099**	**1.0064**		**4,050.0708**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0875	0.0548	0.6858	1.9600e-003	0.1889	1.2500e-003	0.1902	0.0501	1.1500e-003	0.0513		194.9061	194.9061	5.1800e-003		195.0356
Total	**0.0875**	**0.0548**	**0.6858**	**1.9600e-003**	**0.1889**	**1.2500e-003**	**0.1902**	**0.0501**	**1.1500e-003**	**0.0513**		**194.9061**	**194.9061**	**5.1800e-003**		**195.0356**

3.7 Site Preparation6 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.5191	25.7829	21.0308	0.0412		1.2321	1.2321		1.1611	1.1611		3,960.6182	3,960.6182	0.9989		3,985.5913
Total	**2.5191**	**25.7829**	**21.0308**	**0.0412**	**0.0000**	**1.2321**	**1.2321**	**0.0000**	**1.1611**	**1.1611**		**3,960.6182**	**3,960.6182**	**0.9989**		**3,985.5913**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5122	3.2725	25.2889	0.0412		9.6100e-003	9.6100e-003		9.6100e-003	9.6100e-003	0.0000	3,960.6182	3,960.6182	0.9989		3,985.5912
Total	**0.5122**	**3.2725**	**25.2889**	**0.0412**	**0.0000**	**9.6100e-003**	**9.6100e-003**	**0.0000**	**9.6100e-003**	**9.6100e-003**	**0.0000**	**3,960.6182**	**3,960.6182**	**0.9989**		**3,985.5912**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

3.8 Site Preparation7 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2651	0.0000	0.2651	0.0286	0.0000	0.0286			0.0000			0.0000
Off-Road	1.5030	15.6203	9.7943	0.0227		0.7178	0.7178		0.6785	0.6785		2,223.0142	2,223.0142	0.5457		2,236.6563
Total	**1.5030**	**15.6203**	**9.7943**	**0.0227**	**0.2651**	**0.7178**	**0.9830**	**0.0286**	**0.6785**	**0.7071**		**2,223.0142**	**2,223.0142**	**0.5457**		**2,236.6563**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2651	0.0000	0.2651	0.0286	0.0000	0.0286			0.0000			0.0000
Off-Road	0.2798	1.7388	12.2758	0.0227		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	2,223.0142	2,223.0142	0.5457		2,236.6563
Total	**0.2798**	**1.7388**	**12.2758**	**0.0227**	**0.2651**	**5.2800e-003**	**0.2704**	**0.0286**	**5.2800e-003**	**0.0339**	**0.0000**	**2,223.0142**	**2,223.0142**	**0.5457**		**2,236.6563**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0685	0.0429	0.5367	1.5300e-003	0.1479	9.8000e-004	0.1488	0.0392	9.0000e-004	0.0401		152.5352	152.5352	4.0600e-003		152.6366
Total	**0.0685**	**0.0429**	**0.5367**	**1.5300e-003**	**0.1479**	**9.8000e-004**	**0.1488**	**0.0392**	**9.0000e-004**	**0.0401**		**152.5352**	**152.5352**	**4.0600e-003**		**152.6366**

3.8 Site Preparation7 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2651	0.0000	0.2651	0.0286	0.0000	0.0286			0.0000			0.0000
Off-Road	1.3924	14.3271	9.6280	0.0227		0.6383	0.6383		0.6029	0.6029		2,187.4556	2,187.4556	0.5411		2,200.9818
Total	**1.3924**	**14.3271**	**9.6280**	**0.0227**	**0.2651**	**0.6383**	**0.9034**	**0.0286**	**0.6029**	**0.6316**		**2,187.4556**	**2,187.4556**	**0.5411**		**2,200.9818**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2651	0.0000	0.2651	0.0286	0.0000	0.0286			0.0000			0.0000
Off-Road	0.2798	1.7388	12.2758	0.0227		5.2800e-003	5.2800e-003		5.2800e-003	5.2800e-003	0.0000	2,187.4556	2,187.4556	0.5411		2,200.9818
Total	**0.2798**	**1.7388**	**12.2758**	**0.0227**	**0.2651**	**5.2800e-003**	**0.2704**	**0.0286**	**5.2800e-003**	**0.0339**	**0.0000**	**2,187.4556**	**2,187.4556**	**0.5411**		**2,200.9818**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0626	0.0379	0.4830	1.4800e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		147.7398	147.7398	3.5600e-003		147.8288
Total	**0.0626**	**0.0379**	**0.4830**	**1.4800e-003**	**0.1479**	**9.6000e-004**	**0.1488**	**0.0392**	**8.8000e-004**	**0.0401**		**147.7398**	**147.7398**	**3.5600e-003**		**147.8288**

3.9 Site Preparation8 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.7238	18.0105	13.8950	0.0274		0.8588	0.8588		0.8058	0.8058		2,638.7235	2,638.7235	0.6870		2,655.8984
Total	**1.7238**	**18.0105**	**13.8950**	**0.0274**	**0.0000**	**0.8588**	**0.8588**	**0.0000**	**0.8058**	**0.8058**		**2,638.7235**	**2,638.7235**	**0.6870**		**2,655.8984**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.0695**	**0.0421**	**0.5366**	**1.6500e-003**	**0.1643**	**1.0600e-003**	**0.1654**	**0.0436**	**9.8000e-004**	**0.0446**		**164.1553**	**164.1553**	**3.9600e-003**		**164.2542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3536	2.5850	16.5894	0.0274		6.4400e-003	6.4400e-003		6.4400e-003	6.4400e-003	0.0000	2,638.7235	2,638.7235	0.6870		2,655.8984
Total	**0.3536**	**2.5850**	**16.5894**	**0.0274**	**0.0000**	**6.4400e-003**	**6.4400e-003**	**0.0000**	**6.4400e-003**	**6.4400e-003**	**0.0000**	**2,638.7235**	**2,638.7235**	**0.6870**		**2,655.8984**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.0695**	**0.0421**	**0.5366**	**1.6500e-003**	**0.1643**	**1.0600e-003**	**0.1654**	**0.0436**	**9.8000e-004**	**0.0446**		**164.1553**	**164.1553**	**3.9600e-003**		**164.2542**

3.10 Site Preparation9 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.3382	23.7557	19.6360	0.0376		1.1543	1.1543		1.0896	1.0896		3,620.9303	3,620.9303	0.8891		3,643.1568
Total	**2.3382**	**23.7557**	**19.6360**	**0.0376**	**0.0000**	**1.1543**	**1.1543**	**0.0000**	**1.0896**	**1.0896**		**3,620.9303**	**3,620.9303**	**0.8891**		**3,643.1568**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4689	3.0847	23.3023	0.0376		8.7400e-003	8.7400e-003		8.7400e-003	8.7400e-003	0.0000	3,620.9303	3,620.9303	0.8891		3,643.1568
Total	**0.4689**	**3.0847**	**23.3023**	**0.0376**	**0.0000**	**8.7400e-003**	**8.7400e-003**	**0.0000**	**8.7400e-003**	**8.7400e-003**	**0.0000**	**3,620.9303**	**3,620.9303**	**0.8891**		**3,643.1568**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

3.11 Site Preparation10 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0862	0.0000	0.0862	9.3100e-003	0.0000	9.3100e-003			0.0000			0.0000
Off-Road	0.8629	9.0139	6.0063	0.0130		0.4163	0.4163		0.3987	0.3987		1,239.9160	1,239.9160	0.2346		1,245.7809
Total	**0.8629**	**9.0139**	**6.0063**	**0.0130**	**0.0862**	**0.4163**	**0.5025**	**9.3100e-003**	**0.3987**	**0.4080**		**1,239.9160**	**1,239.9160**	**0.2346**		**1,245.7809**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0862	0.0000	0.0862	9.3100e-003	0.0000	9.3100e-003			0.0000			0.0000
Off-Road	0.1492	0.8175	7.0798	0.0130		2.8800e-003	2.8800e-003		2.8800e-003	2.8800e-003	0.0000	1,239.9160	1,239.9160	0.2346		1,245.7809
Total	**0.1492**	**0.8175**	**7.0798**	**0.0130**	**0.0862**	**2.8800e-003**	**0.0891**	**9.3100e-003**	**2.8800e-003**	**0.0122**	**0.0000**	**1,239.9160**	**1,239.9160**	**0.2346**		**1,245.7809**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0316	0.4025	1.2400e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		123.1165	123.1165	2.9700e-003		123.1907
Total	**0.0521**	**0.0316**	**0.4025**	**1.2400e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**123.1165**	**123.1165**	**2.9700e-003**		**123.1907**

3.12 Site Preparation11 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.3382	23.7557	19.6360	0.0376		1.1543	1.1543		1.0896	1.0896		3,620.9303	3,620.9303	0.8891		3,643.1568
Total	**2.3382**	**23.7557**	**19.6360**	**0.0376**	**0.0000**	**1.1543**	**1.1543**	**0.0000**	**1.0896**	**1.0896**		**3,620.9303**	**3,620.9303**	**0.8891**		**3,643.1568**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4689	3.0847	23.3023	0.0376		8.7400e-003	8.7400e-003		8.7400e-003	8.7400e-003	0.0000	3,620.9303	3,620.9303	0.8891		3,643.1568
Total	**0.4689**	**3.0847**	**23.3023**	**0.0376**	**0.0000**	**8.7400e-003**	**8.7400e-003**	**0.0000**	**8.7400e-003**	**8.7400e-003**	**0.0000**	**3,620.9303**	**3,620.9303**	**0.8891**		**3,643.1568**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0799	0.0484	0.6171	1.8900e-003	0.1889	1.2200e-003	0.1902	0.0501	1.1300e-003	0.0512		188.7786	188.7786	4.5500e-003		188.8923
Total	**0.0799**	**0.0484**	**0.6171**	**1.8900e-003**	**0.1889**	**1.2200e-003**	**0.1902**	**0.0501**	**1.1300e-003**	**0.0512**		**188.7786**	**188.7786**	**4.5500e-003**		**188.8923**

3.13 Site Preparation12 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.2344	22.5921	18.8337	0.0356		1.1099	1.1099		1.0487	1.0487		3,424.6760	3,424.6760	0.8256		3,445.3157
Total	**2.2344**	**22.5921**	**18.8337**	**0.0356**	**0.0000**	**1.1099**	**1.1099**	**0.0000**	**1.0487**	**1.0487**		**3,424.6760**	**3,424.6760**	**0.8256**		**3,445.3157**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.0695**	**0.0421**	**0.5366**	**1.6500e-003**	**0.1643**	**1.0600e-003**	**0.1654**	**0.0436**	**9.8000e-004**	**0.0446**		**164.1553**	**164.1553**	**3.9600e-003**		**164.2542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4438	2.9762	22.1556	0.0356		8.2400e-003	8.2400e-003		8.2400e-003	8.2400e-003	0.0000	3,424.6760	3,424.6760	0.8256		3,445.3157
Total	**0.4438**	**2.9762**	**22.1556**	**0.0356**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**3,424.6760**	**3,424.6760**	**0.8256**		**3,445.3157**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0695	0.0421	0.5366	1.6500e-003	0.1643	1.0600e-003	0.1654	0.0436	9.8000e-004	0.0446		164.1553	164.1553	3.9600e-003		164.2542
Total	**0.0695**	**0.0421**	**0.5366**	**1.6500e-003**	**0.1643**	**1.0600e-003**	**0.1654**	**0.0436**	**9.8000e-004**	**0.0446**		**164.1553**	**164.1553**	**3.9600e-003**		**164.2542**

3.14 Site Preparation13 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.5687	16.1593	13.7129	0.0274		0.7487	0.7487		0.7022	0.7022		2,638.9736	2,638.9736	0.6838		2,656.0683
Total	**1.5687**	**16.1593**	**13.7129**	**0.0274**	**0.0000**	**0.7487**	**0.7487**	**0.0000**	**0.7022**	**0.7022**		**2,638.9736**	**2,638.9736**	**0.6838**		**2,656.0683**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3536	2.5850	16.5894	0.0274		6.4400e-003	6.4400e-003		6.4400e-003	6.4400e-003	0.0000	2,638.9736	2,638.9736	0.6838		2,656.0683
Total	**0.3536**	**2.5850**	**16.5894**	**0.0274**	**0.0000**	**6.4400e-003**	**6.4400e-003**	**0.0000**	**6.4400e-003**	**6.4400e-003**	**0.0000**	**2,638.9736**	**2,638.9736**	**0.6838**		**2,656.0683**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

3.15 Site Preparation14 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	0.9755	10.2554	7.2490	0.0160		0.4574	0.4574		0.4342	0.4342		1,530.7685	1,530.7685	0.3254		1,538.9028
Total	**0.9755**	**10.2554**	**7.2490**	**0.0160**	**0.1789**	**0.4574**	**0.6364**	**0.0193**	**0.4342**	**0.4536**		**1,530.7685**	**1,530.7685**	**0.3254**		**1,538.9028**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0579	0.0338	0.4421	1.4300e-003	0.1479	9.3000e-004	0.1488	0.0392	8.6000e-004	0.0401		142.5527	142.5527	3.1900e-003		142.6324
Total	**0.0579**	**0.0338**	**0.4421**	**1.4300e-003**	**0.1479**	**9.3000e-004**	**0.1488**	**0.0392**	**8.6000e-004**	**0.0401**		**142.5527**	**142.5527**	**3.1900e-003**		**142.6324**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	0.1917	1.1859	8.8365	0.0160		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	1,530.7685	1,530.7685	0.3254		1,538.9028
Total	**0.1917**	**1.1859**	**8.8365**	**0.0160**	**0.1789**	**3.6200e-003**	**0.1826**	**0.0193**	**3.6200e-003**	**0.0229**	**0.0000**	**1,530.7685**	**1,530.7685**	**0.3254**		**1,538.9028**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0579	0.0338	0.4421	1.4300e-003	0.1479	9.3000e-004	0.1488	0.0392	8.6000e-004	0.0401		142.5527	142.5527	3.1900e-003		142.6324
Total	**0.0579**	**0.0338**	**0.4421**	**1.4300e-003**	**0.1479**	**9.3000e-004**	**0.1488**	**0.0392**	**8.6000e-004**	**0.0401**		**142.5527**	**142.5527**	**3.1900e-003**		**142.6324**

3.15 Site Preparation14 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	0.8805	9.0091	7.1361	0.0160		0.3935	0.3935		0.3737	0.3737		1,530.9513	1,530.9513	0.3232		1,539.0323
Total	**0.8805**	**9.0091**	**7.1361**	**0.0160**	**0.1789**	**0.3935**	**0.5724**	**0.0193**	**0.3737**	**0.3931**		**1,530.9513**	**1,530.9513**	**0.3232**		**1,539.0323**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0539	0.0303	0.4074	1.3800e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		137.3212	137.3212	2.8600e-003		137.3927
Total	**0.0539**	**0.0303**	**0.4074**	**1.3800e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**137.3212**	**137.3212**	**2.8600e-003**		**137.3927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1789	0.0000	0.1789	0.0193	0.0000	0.0193			0.0000			0.0000
Off-Road	0.1917	1.1859	8.8365	0.0160		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003	0.0000	1,530.9513	1,530.9513	0.3232		1,539.0323
Total	**0.1917**	**1.1859**	**8.8365**	**0.0160**	**0.1789**	**3.6200e-003**	**0.1826**	**0.0193**	**3.6200e-003**	**0.0229**	**0.0000**	**1,530.9513**	**1,530.9513**	**0.3232**		**1,539.0323**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0539	0.0303	0.4074	1.3800e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		137.3212	137.3212	2.8600e-003		137.3927
Total	**0.0539**	**0.0303**	**0.4074**	**1.3800e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**137.3212**	**137.3212**	**2.8600e-003**		**137.3927**

3.16 Site Preparation15 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.0420	20.3840	18.6470	0.0356		0.9726	0.9726		0.9186	0.9186		3,424.7677	3,424.7677	0.8200		3,445.2672
Total	**2.0420**	**20.3840**	**18.6470**	**0.0356**	**0.0000**	**0.9726**	**0.9726**	**0.0000**	**0.9186**	**0.9186**		**3,424.7677**	**3,424.7677**	**0.8200**		**3,445.2672**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4438	2.9762	22.1556	0.0356		8.2400e-003	8.2400e-003		8.2400e-003	8.2400e-003	0.0000	3,424.7677	3,424.7677	0.8200		3,445.2672
Total	**0.4438**	**2.9762**	**22.1556**	**0.0356**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**8.2400e-003**	**8.2400e-003**	**0.0000**	**3,424.7677**	**3,424.7677**	**0.8200**		**3,445.2672**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0643	0.0376	0.4913	1.5900e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		158.3919	158.3919	3.5400e-003		158.4804
Total	**0.0643**	**0.0376**	**0.4913**	**1.5900e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**158.3919**	**158.3919**	**3.5400e-003**		**158.4804**

3.17 Site Preparation16 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	0.8281	8.4150	6.8041	0.0149		0.3755	0.3755		0.3572	0.3572		1,423.6769	1,423.6769	0.2885		1,430.8905
Total	**0.8281**	**8.4150**	**6.8041**	**0.0149**	**0.1326**	**0.3755**	**0.5080**	**0.0143**	**0.3572**	**0.3715**		**1,423.6769**	**1,423.6769**	**0.2885**		**1,430.8905**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0539	0.0303	0.4074	1.3800e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		137.3212	137.3212	2.8600e-003		137.3927
Total	**0.0539**	**0.0303**	**0.4074**	**1.3800e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**137.3212**	**137.3212**	**2.8600e-003**		**137.3927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1326	0.0000	0.1326	0.0143	0.0000	0.0143			0.0000			0.0000
Off-Road	0.1753	1.0228	8.2841	0.0149		3.3500e-003	3.3500e-003		3.3500e-003	3.3500e-003	0.0000	1,423.6769	1,423.6769	0.2885		1,430.8905
Total	**0.1753**	**1.0228**	**8.2841**	**0.0149**	**0.1326**	**3.3500e-003**	**0.1359**	**0.0143**	**3.3500e-003**	**0.0177**	**0.0000**	**1,423.6769**	**1,423.6769**	**0.2885**		**1,430.8905**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0539	0.0303	0.4074	1.3800e-003	0.1479	9.1000e-004	0.1488	0.0392	8.4000e-004	0.0401		137.3212	137.3212	2.8600e-003		137.3927
Total	**0.0539**	**0.0303**	**0.4074**	**1.3800e-003**	**0.1479**	**9.1000e-004**	**0.1488**	**0.0392**	**8.4000e-004**	**0.0401**		**137.3212**	**137.3212**	**2.8600e-003**		**137.3927**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.580272	0.038274	0.193741	0.109917	0.015100	0.005324	0.018491	0.026678	0.002649	0.002134	0.005793	0.000896	0.000732

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.6000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233
Unmitigated	9.6000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.4000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233
Total	**9.6000e-004**	**9.0000e-005**	**0.0102**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**		**0.0233**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.4000e-004	9.0000e-005	0.0102	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0233
Total	**9.6000e-004**	**9.0000e-005**	**0.0102**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**		**0.0233**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX 3.9E

NBWRP Phase 2 San Francisco Bay Area Air Basin, Annual

North Bay Water Reuse Program Phase 2

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	100.00	User Defined Unit	1.00	1.00	1

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
Land Use - Placeholder; Model run only for construction.
Construction Phase - See Construction Equipment Work Hours estimated outside of model for total days assumptions.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project. Pavers and concrete saws are not required because the pipeline would not be installed within a road.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project.
Off-road Equipment - Changed per project; pavers not required because pipeilne would not be installed within a road.
Off-road Equipment - Changed per project.
Construction Off-road Equipment Mitigation - Mitigation to use Tier 4 off-road equipment.

North Bay Water Reuse Program Phase 2 - San Francisco Bay Area Air Basin, Annual

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tblVehicleEF	LDA	7.9650e-003	0.01
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.07	0.12
tblVehicleEF	LDA	2.2760e-003	2.6920e-003
tblVehicleEF	LDA	5.5200e-004	6.4800e-004
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.09	0.13
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.08	0.13
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tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.86	1.27

tblVehicleEF	LDT1	2.15	3.40
tblVehicleEF	LDT1	285.82	328.14
tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.08	0.13
tblVehicleEF	LDT1	0.12	0.19
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003
tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.19	0.27
tblVehicleEF	LDT1	0.06	0.08
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.14	0.18
tblVehicleEF	LDT1	0.14	0.23
tblVehicleEF	LDT1	2.8670e-003	3.2960e-003
tblVehicleEF	LDT1	6.9800e-004	8.0100e-004
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.19	0.27
tblVehicleEF	LDT1	0.06	0.08
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.14	0.18
tblVehicleEF	LDT1	0.15	0.26
tblVehicleEF	LDT1	7.3430e-003	0.01
tblVehicleEF	LDT1	8.3290e-003	0.01
tblVehicleEF	LDT1	0.99	1.47
tblVehicleEF	LDT1	1.67	2.62
tblVehicleEF	LDT1	307.35	352.76
tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.07	0.12
tblVehicleEF	LDT1	0.10	0.17
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003

tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.17	0.23
tblVehicleEF	LDT1	0.22	0.30
tblVehicleEF	LDT1	0.13	0.17
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.11	0.19
tblVehicleEF	LDT1	3.0840e-003	3.5450e-003
tblVehicleEF	LDT1	6.9000e-004	7.8700e-004
tblVehicleEF	LDT1	0.17	0.23
tblVehicleEF	LDT1	0.22	0.30
tblVehicleEF	LDT1	0.13	0.17
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.12	0.21
tblVehicleEF	LDT1	6.5190e-003	0.01
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.85	1.27
tblVehicleEF	LDT1	2.53	4.00
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tblVehicleEF	LDT1	66.12	74.12
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.09	0.15
tblVehicleEF	LDT1	0.13	0.21
tblVehicleEF	LDT1	2.1160e-003	2.5120e-003
tblVehicleEF	LDT1	2.8640e-003	3.3770e-003
tblVehicleEF	LDT1	1.9480e-003	2.3130e-003
tblVehicleEF	LDT1	2.6330e-003	3.1060e-003
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.21	0.29
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.02	0.03
tblVehicleEF	LDT1	0.17	0.22
tblVehicleEF	LDT1	0.16	0.27

tblVehicleEF	LDT1	2.8410e-003	3.2670e-003
tblVehicleEF	LDT1	7.0500e-004	8.1100e-004
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.21	0.29
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.17	0.22
tblVehicleEF	LDT1	0.17	0.29
tblVehicleEF	LDT2	4.4670e-003	6.2630e-003
tblVehicleEF	LDT2	5.7230e-003	9.2100e-003
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tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.09	0.16
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	3.2320e-003	3.7390e-003
tblVehicleEF	LDT2	7.6400e-004	8.7900e-004
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.08	0.14

tblVehicleEF	LDT2	4.9670e-003	6.9560e-003
tblVehicleEF	LDT2	4.7180e-003	7.5690e-003
tblVehicleEF	LDT2	0.72	0.91
tblVehicleEF	LDT2	1.03	1.49
tblVehicleEF	LDT2	347.35	401.90
tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.08	0.14
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.08
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.06	0.10
tblVehicleEF	LDT2	3.4790e-003	4.0260e-003
tblVehicleEF	LDT2	7.5900e-004	8.7100e-004
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.10	0.14
tblVehicleEF	LDT2	0.07	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.07
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	4.3560e-003	6.1220e-003
tblVehicleEF	LDT2	6.4640e-003	0.01
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tblVehicleEF	LDT2	74.24	84.63
tblVehicleEF	LDT2	0.19	0.19
tblVehicleEF	LDT2	0.07	0.10

tblVehicleEF	LDT2	0.10	0.17
tblVehicleEF	LDT2	1.7140e-003	1.7000e-003
tblVehicleEF	LDT2	2.3360e-003	2.2550e-003
tblVehicleEF	LDT2	1.5760e-003	1.5630e-003
tblVehicleEF	LDT2	2.1480e-003	2.0740e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.08	0.09
tblVehicleEF	LDT2	0.09	0.14
tblVehicleEF	LDT2	3.2020e-003	3.7050e-003
tblVehicleEF	LDT2	7.6800e-004	8.8400e-004
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.10	0.13
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.08	0.09
tblVehicleEF	LDT2	0.10	0.15
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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
tblVehicleEF	LHD1	0.98	1.32
tblVehicleEF	LHD1	2.37	3.04
tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.19	1.63
tblVehicleEF	LHD1	0.93	1.10
tblVehicleEF	LHD1	9.0300e-004	9.0900e-004
tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02

tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
tblVehicleEF	LHD1	8.6400e-004	8.7000e-004
tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	2.2490e-003	2.5080e-003
tblVehicleEF	LHD1	0.10	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.2490e-003	1.3230e-003
tblVehicleEF	LHD1	0.12	0.14
tblVehicleEF	LHD1	0.31	0.32
tblVehicleEF	LHD1	0.24	0.31
tblVehicleEF	LHD1	6.6740e-003	6.9910e-003
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tblVehicleEF	LHD1	2.2490e-003	2.5080e-003
tblVehicleEF	LHD1	0.10	0.11
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.2490e-003	1.3230e-003
tblVehicleEF	LHD1	0.15	0.18
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tblVehicleEF	LHD1	0.26	0.34
tblVehicleEF	LHD1	5.0010e-003	6.0100e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
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tblVehicleEF	LHD1	2.18	2.79
tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.14	1.56
tblVehicleEF	LHD1	0.87	1.02
tblVehicleEF	LHD1	9.0300e-004	9.0900e-004

tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
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tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	5.2840e-003	6.0230e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.6100e-003	2.8770e-003
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tblVehicleEF	LHD1	0.30	0.31
tblVehicleEF	LHD1	0.22	0.29
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tblVehicleEF	LHD1	3.4800e-004	3.8800e-004
tblVehicleEF	LHD1	5.2840e-003	6.0230e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.6100e-003	2.8770e-003
tblVehicleEF	LHD1	0.15	0.18
tblVehicleEF	LHD1	0.30	0.31
tblVehicleEF	LHD1	0.24	0.32
tblVehicleEF	LHD1	5.0010e-003	6.0100e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.14	0.15
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tblVehicleEF	LHD1	9.06	9.07
tblVehicleEF	LHD1	680.76	711.01
tblVehicleEF	LHD1	30.65	33.48
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	1.22	1.67

tblVehicleEF	LHD1	0.99	1.17
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tblVehicleEF	LHD1	0.01	9.9640e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	8.7500e-004	1.0890e-003
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tblVehicleEF	LHD1	2.5440e-003	2.4910e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	8.0400e-004	1.0020e-003
tblVehicleEF	LHD1	1.0100e-003	1.0710e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.9800e-004	6.1100e-004
tblVehicleEF	LHD1	0.12	0.14
tblVehicleEF	LHD1	0.35	0.36
tblVehicleEF	LHD1	0.25	0.33
tblVehicleEF	LHD1	6.6740e-003	6.9900e-003
tblVehicleEF	LHD1	3.5400e-004	3.9600e-004
tblVehicleEF	LHD1	1.0100e-003	1.0710e-003
tblVehicleEF	LHD1	0.11	0.12
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	5.9800e-004	6.1100e-004
tblVehicleEF	LHD1	0.15	0.17
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tblVehicleEF	LHD1	0.27	0.36
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tblVehicleEF	LHD2	7.0930e-003	0.01
tblVehicleEF	LHD2	6.0220e-003	0.01
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.54	0.70
tblVehicleEF	LHD2	1.10	1.49
tblVehicleEF	LHD2	13.94	14.11
tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003

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tblVehicleEF	LHD2	0.65	1.17
tblVehicleEF	LHD2	0.42	0.58
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
tblVehicleEF	LHD2	6.7800e-004	9.6300e-004
tblVehicleEF	LHD2	0.03	0.04
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tblVehicleEF	LHD2	4.0400e-004	5.2500e-004
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tblVehicleEF	LHD2	0.06	0.10
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
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tblVehicleEF	LHD2	6.7800e-004	9.6300e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.0400e-004	5.2500e-004
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.06	0.10
tblVehicleEF	LHD2	0.09	0.15
tblVehicleEF	LHD2	3.2340e-003	4.0830e-003
tblVehicleEF	LHD2	7.1900e-003	0.01
tblVehicleEF	LHD2	5.6920e-003	9.4580e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.54	0.71
tblVehicleEF	LHD2	1.02	1.37
tblVehicleEF	LHD2	13.94	14.11

tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.62	1.13
tblVehicleEF	LHD2	0.40	0.54
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
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tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	8.3900e-004	1.1340e-003
tblVehicleEF	LHD2	0.10	0.12
tblVehicleEF	LHD2	0.06	0.09
tblVehicleEF	LHD2	0.08	0.13
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
tblVehicleEF	LHD2	6.8280e-003	7.1210e-003
tblVehicleEF	LHD2	2.5600e-004	2.8500e-004
tblVehicleEF	LHD2	1.5810e-003	2.3000e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.3900e-004	1.1340e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.06	0.09
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	3.2340e-003	4.0830e-003
tblVehicleEF	LHD2	7.0200e-003	0.01
tblVehicleEF	LHD2	6.2950e-003	0.01
tblVehicleEF	LHD2	0.12	0.13

tblVehicleEF	LHD2	0.54	0.69
tblVehicleEF	LHD2	1.17	1.59
tblVehicleEF	LHD2	13.94	14.11
tblVehicleEF	LHD2	702.20	731.41
tblVehicleEF	LHD2	23.82	25.96
tblVehicleEF	LHD2	5.3240e-003	5.3710e-003
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.66	1.20
tblVehicleEF	LHD2	0.44	0.62
tblVehicleEF	LHD2	1.2090e-003	1.3080e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.8900e-004	4.9000e-004
tblVehicleEF	LHD2	1.1570e-003	1.2510e-003
tblVehicleEF	LHD2	2.6920e-003	2.6710e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5800e-004	4.5100e-004
tblVehicleEF	LHD2	3.2300e-004	4.2900e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	1.9700e-004	2.4700e-004
tblVehicleEF	LHD2	0.10	0.12
tblVehicleEF	LHD2	0.07	0.11
tblVehicleEF	LHD2	0.08	0.14
tblVehicleEF	LHD2	1.3600e-004	1.3800e-004
tblVehicleEF	LHD2	6.8280e-003	7.1200e-003
tblVehicleEF	LHD2	2.5900e-004	2.8900e-004
tblVehicleEF	LHD2	3.2300e-004	4.2900e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.9700e-004	2.4700e-004
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.07	0.11
tblVehicleEF	LHD2	0.09	0.16
tblVehicleEF	MCY	0.46	0.45

tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	19.35	20.92
tblVehicleEF	MCY	10.27	10.18
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.16	1.17
tblVehicleEF	MCY	0.32	0.32
tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	0.82	0.83
tblVehicleEF	MCY	0.70	0.77
tblVehicleEF	MCY	0.47	0.49
tblVehicleEF	MCY	2.28	2.38
tblVehicleEF	MCY	0.59	0.67
tblVehicleEF	MCY	2.22	2.29
tblVehicleEF	MCY	2.1250e-003	2.1330e-003
tblVehicleEF	MCY	6.8500e-004	7.0200e-004
tblVehicleEF	MCY	0.82	0.83
tblVehicleEF	MCY	0.70	0.77
tblVehicleEF	MCY	0.47	0.49
tblVehicleEF	MCY	2.83	2.91
tblVehicleEF	MCY	0.59	0.67
tblVehicleEF	MCY	2.42	2.49
tblVehicleEF	MCY	0.45	0.43
tblVehicleEF	MCY	0.14	0.14
tblVehicleEF	MCY	18.43	19.84
tblVehicleEF	MCY	8.92	8.91
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.02	1.03
tblVehicleEF	MCY	0.29	0.29

tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	2.26	2.31
tblVehicleEF	MCY	0.92	0.98
tblVehicleEF	MCY	1.34	1.41
tblVehicleEF	MCY	2.19	2.27
tblVehicleEF	MCY	0.55	0.63
tblVehicleEF	MCY	1.85	1.89
tblVehicleEF	MCY	2.1080e-003	2.1130e-003
tblVehicleEF	MCY	6.5100e-004	6.6900e-004
tblVehicleEF	MCY	2.26	2.31
tblVehicleEF	MCY	0.92	0.98
tblVehicleEF	MCY	1.34	1.41
tblVehicleEF	MCY	2.72	2.79
tblVehicleEF	MCY	0.55	0.63
tblVehicleEF	MCY	2.01	2.06
tblVehicleEF	MCY	0.48	0.47
tblVehicleEF	MCY	0.19	0.20
tblVehicleEF	MCY	20.90	22.72
tblVehicleEF	MCY	11.71	11.58
tblVehicleEF	MCY	174.20	172.27
tblVehicleEF	MCY	45.11	46.79
tblVehicleEF	MCY	5.7930e-003	5.9420e-003
tblVehicleEF	MCY	1.24	1.26
tblVehicleEF	MCY	0.34	0.34
tblVehicleEF	MCY	2.1140e-003	2.0050e-003
tblVehicleEF	MCY	3.6670e-003	4.4220e-003
tblVehicleEF	MCY	1.9760e-003	1.8800e-003
tblVehicleEF	MCY	3.4500e-003	4.1820e-003
tblVehicleEF	MCY	0.27	0.27
tblVehicleEF	MCY	0.84	0.93
tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	2.37	2.49

tblVehicleEF	MCY	0.70	0.79
tblVehicleEF	MCY	2.57	2.67
tblVehicleEF	MCY	2.1530e-003	2.1650e-003
tblVehicleEF	MCY	7.1900e-004	7.3600e-004
tblVehicleEF	MCY	0.27	0.27
tblVehicleEF	MCY	0.84	0.93
tblVehicleEF	MCY	0.16	0.17
tblVehicleEF	MCY	2.94	3.05
tblVehicleEF	MCY	0.70	0.79
tblVehicleEF	MCY	2.80	2.90
tblVehicleEF	MDV	8.0870e-003	0.01
tblVehicleEF	MDV	0.01	0.02
tblVehicleEF	MDV	0.92	1.37
tblVehicleEF	MDV	2.44	3.60
tblVehicleEF	MDV	435.22	495.13
tblVehicleEF	MDV	98.68	110.40
tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.11	0.18
tblVehicleEF	MDV	0.21	0.33
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.16	0.18
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.10	0.11
tblVehicleEF	MDV	0.18	0.28
tblVehicleEF	MDV	4.3550e-003	4.9610e-003
tblVehicleEF	MDV	1.0290e-003	1.1680e-003
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.16	0.18
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.03	0.05

tblVehicleEF	MDV	0.10	0.11
tblVehicleEF	MDV	0.20	0.31
tblVehicleEF	MDV	8.9890e-003	0.01
tblVehicleEF	MDV	0.01	0.02
tblVehicleEF	MDV	1.07	1.58
tblVehicleEF	MDV	1.90	2.82
tblVehicleEF	MDV	467.67	532.29
tblVehicleEF	MDV	98.68	110.40
tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.10	0.16
tblVehicleEF	MDV	0.18	0.29
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.13	0.14
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.11	0.12
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.15	0.23
tblVehicleEF	MDV	4.6820e-003	5.3360e-003
tblVehicleEF	MDV	1.0200e-003	1.1540e-003
tblVehicleEF	MDV	0.13	0.14
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.11	0.12
tblVehicleEF	MDV	0.03	0.05
tblVehicleEF	MDV	0.09	0.10
tblVehicleEF	MDV	0.16	0.25
tblVehicleEF	MDV	7.9010e-003	0.01
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.91	1.38
tblVehicleEF	MDV	2.85	4.21
tblVehicleEF	MDV	431.24	490.55
tblVehicleEF	MDV	98.68	110.40

tblVehicleEF	MDV	0.11	0.11
tblVehicleEF	MDV	0.12	0.19
tblVehicleEF	MDV	0.23	0.35
tblVehicleEF	MDV	1.7970e-003	1.9180e-003
tblVehicleEF	MDV	2.4290e-003	2.6230e-003
tblVehicleEF	MDV	1.6560e-003	1.7690e-003
tblVehicleEF	MDV	2.2330e-003	2.4150e-003
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.16	0.19
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.02	0.04
tblVehicleEF	MDV	0.12	0.13
tblVehicleEF	MDV	0.20	0.32
tblVehicleEF	MDV	4.3150e-003	4.9160e-003
tblVehicleEF	MDV	1.0370e-003	1.1790e-003
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.16	0.19
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.03	0.05
tblVehicleEF	MDV	0.12	0.13
tblVehicleEF	MDV	0.22	0.35
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.57	3.51
tblVehicleEF	MH	5.10	7.25
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
tblVehicleEF	MH	7.3200e-004	8.1200e-004
tblVehicleEF	MH	1.21	1.60
tblVehicleEF	MH	0.77	0.96
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03

tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	0.65	0.94
tblVehicleEF	MH	0.06	0.09
tblVehicleEF	MH	0.25	0.34
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.29	0.44
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7100e-004	7.4500e-004
tblVehicleEF	MH	0.65	0.94
tblVehicleEF	MH	0.06	0.09
tblVehicleEF	MH	0.25	0.34
tblVehicleEF	MH	0.11	0.20
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.32	0.48
tblVehicleEF	MH	0.02	0.05
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.64	3.63
tblVehicleEF	MH	4.61	6.56
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
tblVehicleEF	MH	7.3200e-004	8.1200e-004
tblVehicleEF	MH	1.14	1.50
tblVehicleEF	MH	0.71	0.89
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	1.55	2.28
tblVehicleEF	MH	0.07	0.09
tblVehicleEF	MH	0.53	0.76
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02

tblVehicleEF	MH	0.27	0.40
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.6200e-004	7.3300e-004
tblVehicleEF	MH	1.55	2.28
tblVehicleEF	MH	0.07	0.09
tblVehicleEF	MH	0.53	0.76
tblVehicleEF	MH	0.11	0.21
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.30	0.44
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.52	3.46
tblVehicleEF	MH	5.53	7.91
tblVehicleEF	MH	1,207.19	1,228.67
tblVehicleEF	MH	58.21	61.77
tblVehicleEF	MH	7.3200e-004	8.1200e-004
tblVehicleEF	MH	1.25	1.66
tblVehicleEF	MH	0.81	1.02
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.0390e-003	1.5510e-003
tblVehicleEF	MH	3.2220e-003	3.2150e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	9.5500e-004	1.4350e-003
tblVehicleEF	MH	0.28	0.37
tblVehicleEF	MH	0.07	0.10
tblVehicleEF	MH	0.12	0.15
tblVehicleEF	MH	0.08	0.15
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.31	0.46
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.7800e-004	7.5600e-004
tblVehicleEF	MH	0.28	0.37
tblVehicleEF	MH	0.07	0.10
tblVehicleEF	MH	0.12	0.15

tblVehicleEF	MH	0.10	0.20
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.34	0.51
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	3.7750e-003	9.9170e-003
tblVehicleEF	MHD	0.05	0.06
tblVehicleEF	MHD	0.33	0.44
tblVehicleEF	MHD	0.32	0.64
tblVehicleEF	MHD	4.91	7.43
tblVehicleEF	MHD	148.90	151.53
tblVehicleEF	MHD	1,183.15	1,207.41
tblVehicleEF	MHD	53.72	57.19
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.41	0.97
tblVehicleEF	MHD	1.10	2.26
tblVehicleEF	MHD	11.49	11.36
tblVehicleEF	MHD	1.2000e-004	3.0950e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	1.1500e-004	2.9610e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
tblVehicleEF	MHD	7.1400e-004	1.0180e-003
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	4.1300e-004	5.3600e-004
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.29	0.44
tblVehicleEF	MHD	1.4320e-003	1.4570e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.2300e-004	7.0200e-004
tblVehicleEF	MHD	7.1400e-004	1.0180e-003
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.03	0.04

tblVehicleEF	MHD	4.1300e-004	5.3600e-004
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.32	0.48
tblVehicleEF	MHD	0.01	0.02
tblVehicleEF	MHD	3.8500e-003	0.01
tblVehicleEF	MHD	0.04	0.06
tblVehicleEF	MHD	0.23	0.31
tblVehicleEF	MHD	0.32	0.66
tblVehicleEF	MHD	4.49	6.78
tblVehicleEF	MHD	157.87	160.66
tblVehicleEF	MHD	1,183.15	1,207.41
tblVehicleEF	MHD	53.72	57.19
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.43	1.00
tblVehicleEF	MHD	1.06	2.17
tblVehicleEF	MHD	11.44	11.28
tblVehicleEF	MHD	1.0100e-004	2.6090e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	9.7000e-005	2.4960e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
tblVehicleEF	MHD	1.7020e-003	2.5140e-003
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	8.9500e-004	1.2420e-003
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.28	0.41
tblVehicleEF	MHD	1.5160e-003	1.5430e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.1600e-004	6.9100e-004
tblVehicleEF	MHD	1.7020e-003	2.5140e-003
tblVehicleEF	MHD	0.04	0.05

tblVehicleEF	MHD	0.03	0.04
tblVehicleEF	MHD	8.9500e-004	1.2420e-003
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.30	0.45
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	3.7230e-003	9.7820e-003
tblVehicleEF	MHD	0.05	0.07
tblVehicleEF	MHD	0.44	0.58
tblVehicleEF	MHD	0.31	0.64
tblVehicleEF	MHD	5.29	8.00
tblVehicleEF	MHD	136.85	139.26
tblVehicleEF	MHD	1,183.15	1,207.41
tblVehicleEF	MHD	53.72	57.19
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.39	0.92
tblVehicleEF	MHD	1.12	2.30
tblVehicleEF	MHD	11.53	11.42
tblVehicleEF	MHD	1.4600e-004	3.7660e-003
tblVehicleEF	MHD	3.1140e-003	0.05
tblVehicleEF	MHD	7.7100e-004	9.6600e-004
tblVehicleEF	MHD	1.4000e-004	3.6030e-003
tblVehicleEF	MHD	2.9740e-003	0.04
tblVehicleEF	MHD	7.0900e-004	8.8900e-004
tblVehicleEF	MHD	3.2900e-004	4.2600e-004
tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.02	0.04
tblVehicleEF	MHD	1.9300e-004	2.3400e-004
tblVehicleEF	MHD	0.04	0.12
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	0.31	0.47
tblVehicleEF	MHD	1.3180e-003	1.3420e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	6.2900e-004	7.1200e-004
tblVehicleEF	MHD	3.2900e-004	4.2600e-004

tblVehicleEF	MHD	0.04	0.05
tblVehicleEF	MHD	0.03	0.05
tblVehicleEF	MHD	1.9300e-004	2.3400e-004
tblVehicleEF	MHD	0.05	0.14
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	0.34	0.51
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2850e-003	0.01
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.24	0.29
tblVehicleEF	OBUS	0.45	0.74
tblVehicleEF	OBUS	5.07	6.29
tblVehicleEF	OBUS	117.04	126.46
tblVehicleEF	OBUS	1,295.29	1,327.27
tblVehicleEF	OBUS	65.39	66.62
tblVehicleEF	OBUS	2.6490e-003	2.5450e-003
tblVehicleEF	OBUS	0.26	0.78
tblVehicleEF	OBUS	0.97	2.45
tblVehicleEF	OBUS	3.12	3.35
tblVehicleEF	OBUS	2.3000e-005	3.6800e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	2.2000e-005	3.5200e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	1.1060e-003	1.1640e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	5.2600e-004	5.3400e-004
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.31	0.39
tblVehicleEF	OBUS	1.1280e-003	1.2180e-003
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4300e-004	7.7700e-004

tblVehicleEF	OBUS	1.1060e-003	1.1640e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	5.2600e-004	5.3400e-004
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.34	0.43
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.4610e-003	0.01
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.24	0.27
tblVehicleEF	OBUS	0.46	0.76
tblVehicleEF	OBUS	4.61	5.72
tblVehicleEF	OBUS	123.04	133.00
tblVehicleEF	OBUS	1,295.29	1,327.27
tblVehicleEF	OBUS	65.39	66.62
tblVehicleEF	OBUS	2.6490e-003	2.5450e-003
tblVehicleEF	OBUS	0.27	0.81
tblVehicleEF	OBUS	0.92	2.34
tblVehicleEF	OBUS	3.06	3.28
tblVehicleEF	OBUS	2.0000e-005	3.1000e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	1.9000e-005	2.9600e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	2.5230e-003	2.7110e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	1.1140e-003	1.1710e-003
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.29	0.37
tblVehicleEF	OBUS	1.1850e-003	1.2810e-003
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.3500e-004	7.6700e-004
tblVehicleEF	OBUS	2.5230e-003	2.7110e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	1.1140e-003	1.1710e-003
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.32	0.40
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.1590e-003	0.01
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.25	0.32
tblVehicleEF	OBUS	0.44	0.73
tblVehicleEF	OBUS	5.46	6.77
tblVehicleEF	OBUS	108.75	117.42
tblVehicleEF	OBUS	1,295.29	1,327.27
tblVehicleEF	OBUS	65.39	66.62
tblVehicleEF	OBUS	2.6490e-003	2.5450e-003
tblVehicleEF	OBUS	0.25	0.75
tblVehicleEF	OBUS	0.99	2.49
tblVehicleEF	OBUS	3.17	3.42
tblVehicleEF	OBUS	2.8000e-005	4.4700e-004
tblVehicleEF	OBUS	2.8640e-003	0.01
tblVehicleEF	OBUS	8.2600e-004	7.7300e-004
tblVehicleEF	OBUS	2.7000e-005	4.2800e-004
tblVehicleEF	OBUS	2.7220e-003	0.01
tblVehicleEF	OBUS	7.6000e-004	7.1200e-004
tblVehicleEF	OBUS	5.7500e-004	5.7700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	2.6000e-004	2.5700e-004
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.33	0.41
tblVehicleEF	OBUS	1.0490e-003	1.1320e-003

tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4900e-004	7.8500e-004
tblVehicleEF	OBUS	5.7500e-004	5.7700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	2.6000e-004	2.5700e-004
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.36	0.45
tblVehicleEF	SBUS	0.83	0.88
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.07	0.09
tblVehicleEF	SBUS	5.84	5.40
tblVehicleEF	SBUS	0.65	0.87
tblVehicleEF	SBUS	5.74	6.36
tblVehicleEF	SBUS	1,231.71	1,288.91
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	9.96	13.15
tblVehicleEF	SBUS	3.91	5.51
tblVehicleEF	SBUS	14.73	15.68
tblVehicleEF	SBUS	8.9310e-003	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	8.5440e-003	0.01
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	1.8160e-003	1.9710e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.69	0.65
tblVehicleEF	SBUS	8.6000e-004	8.0700e-004
tblVehicleEF	SBUS	0.10	0.13

tblVehicleEF	SBUS	8.8680e-003	0.01
tblVehicleEF	SBUS	0.29	0.32
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.8300e-004	4.4600e-004
tblVehicleEF	SBUS	1.8160e-003	1.9710e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	1.00	0.93
tblVehicleEF	SBUS	8.6000e-004	8.0700e-004
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	8.8680e-003	0.01
tblVehicleEF	SBUS	0.31	0.34
tblVehicleEF	SBUS	0.83	0.88
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.06	0.07
tblVehicleEF	SBUS	5.72	5.24
tblVehicleEF	SBUS	0.66	0.89
tblVehicleEF	SBUS	4.21	4.66
tblVehicleEF	SBUS	1,293.63	1,355.64
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	10.28	13.58
tblVehicleEF	SBUS	3.75	5.29
tblVehicleEF	SBUS	14.70	15.64
tblVehicleEF	SBUS	7.5280e-003	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	7.2030e-003	0.01
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	4.0820e-003	4.5750e-003
tblVehicleEF	SBUS	0.02	0.02

tblVehicleEF	SBUS	0.69	0.65
tblVehicleEF	SBUS	1.8080e-003	1.7980e-003
tblVehicleEF	SBUS	0.10	0.13
tblVehicleEF	SBUS	7.5760e-003	9.4490e-003
tblVehicleEF	SBUS	0.24	0.26
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	4.5700e-004	4.1700e-004
tblVehicleEF	SBUS	4.0820e-003	4.5750e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.99	0.93
tblVehicleEF	SBUS	1.8080e-003	1.7980e-003
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	7.5760e-003	9.4490e-003
tblVehicleEF	SBUS	0.26	0.29
tblVehicleEF	SBUS	0.84	0.89
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.10
tblVehicleEF	SBUS	6.01	5.63
tblVehicleEF	SBUS	0.64	0.85
tblVehicleEF	SBUS	7.17	7.95
tblVehicleEF	SBUS	1,146.20	1,196.76
tblVehicleEF	SBUS	1,121.73	1,154.61
tblVehicleEF	SBUS	38.42	33.60
tblVehicleEF	SBUS	8.9600e-004	8.7700e-004
tblVehicleEF	SBUS	9.52	12.57
tblVehicleEF	SBUS	3.98	5.61
tblVehicleEF	SBUS	14.75	15.71
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	6.4900e-004	5.6500e-004
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	2.7440e-003	2.7770e-003
tblVehicleEF	SBUS	0.02	0.03

tblVehicleEF	SBUS	5.9700e-004	5.1900e-004
tblVehicleEF	SBUS	9.6700e-004	9.4300e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.70	0.66
tblVehicleEF	SBUS	4.3200e-004	3.9300e-004
tblVehicleEF	SBUS	0.10	0.13
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.32	0.36
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	5.0700e-004	4.7200e-004
tblVehicleEF	SBUS	9.6700e-004	9.4300e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	1.00	0.94
tblVehicleEF	SBUS	4.3200e-004	3.9300e-004
tblVehicleEF	SBUS	0.12	0.15
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.35	0.39
tblVehicleEF	UBUS	0.28	0.30
tblVehicleEF	UBUS	0.05	0.05
tblVehicleEF	UBUS	5.17	6.15
tblVehicleEF	UBUS	8.35	8.31
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	10.13	13.34
tblVehicleEF	UBUS	14.91	16.06
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	2.7420e-003	2.6490e-003
tblVehicleEF	UBUS	0.05	0.06

tblVehicleEF	UBUS	1.4690e-003	1.3090e-003
tblVehicleEF	UBUS	0.60	0.81
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.65	0.61
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1690e-003	1.0030e-003
tblVehicleEF	UBUS	2.7420e-003	2.6490e-003
tblVehicleEF	UBUS	0.05	0.06
tblVehicleEF	UBUS	1.4690e-003	1.3090e-003
tblVehicleEF	UBUS	0.93	1.18
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.71	0.66
tblVehicleEF	UBUS	0.28	0.30
tblVehicleEF	UBUS	0.04	0.04
tblVehicleEF	UBUS	5.22	6.22
tblVehicleEF	UBUS	6.59	6.51
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	9.70	12.78
tblVehicleEF	UBUS	14.83	15.98
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	6.5140e-003	6.4350e-003
tblVehicleEF	UBUS	0.06	0.06
tblVehicleEF	UBUS	3.1610e-003	2.9500e-003
tblVehicleEF	UBUS	0.61	0.82
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.56	0.52
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1380e-003	9.7200e-004

tblVehicleEF	UBUS	6.5140e-003	6.4350e-003
tblVehicleEF	UBUS	0.06	0.06
tblVehicleEF	UBUS	3.1610e-003	2.9500e-003
tblVehicleEF	UBUS	0.94	1.20
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.62	0.57
tblVehicleEF	UBUS	0.27	0.30
tblVehicleEF	UBUS	0.05	0.05
tblVehicleEF	UBUS	5.13	6.10
tblVehicleEF	UBUS	9.93	9.94
tblVehicleEF	UBUS	2,092.94	2,178.97
tblVehicleEF	UBUS	101.81	85.39
tblVehicleEF	UBUS	2.1340e-003	2.4420e-003
tblVehicleEF	UBUS	10.29	13.55
tblVehicleEF	UBUS	14.97	16.12
tblVehicleEF	UBUS	0.60	0.64
tblVehicleEF	UBUS	0.20	0.28
tblVehicleEF	UBUS	1.0730e-003	8.6900e-004
tblVehicleEF	UBUS	0.26	0.28
tblVehicleEF	UBUS	0.19	0.26
tblVehicleEF	UBUS	9.8700e-004	7.9900e-004
tblVehicleEF	UBUS	1.2450e-003	1.1230e-003
tblVehicleEF	UBUS	0.06	0.07
tblVehicleEF	UBUS	6.7200e-004	5.5800e-004
tblVehicleEF	UBUS	0.60	0.81
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.72	0.68
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	1.1960e-003	1.0310e-003
tblVehicleEF	UBUS	1.2450e-003	1.1230e-003
tblVehicleEF	UBUS	0.06	0.07
tblVehicleEF	UBUS	6.7200e-004	5.5800e-004
tblVehicleEF	UBUS	0.92	1.17
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.79	0.74

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0605	0.5925	0.3973	7.7000e-004	0.0134	0.0307	0.0441	2.2300e-003	0.0291	0.0314	0.0000	69.1978	69.1978	0.0146	0.0000	69.5639
2019	0.3679	3.6506	2.7023	5.3700e-003	0.0727	0.1813	0.2539	0.0127	0.1716	0.1843	0.0000	475.6361	475.6361	0.1051	0.0000	478.2634
2020	0.9340	9.2243	7.5576	0.0152	0.1037	0.4410	0.5447	0.0232	0.4166	0.4398	0.0000	1,331.5555	1,331.5555	0.3091	0.0000	1,339.2840
2021	0.1984	1.9443	1.7389	3.5000e-003	0.0295	0.0908	0.1202	6.0600e-003	0.0856	0.0916	0.0000	306.2631	306.2631	0.0714	0.0000	308.0471
2022	0.0747	0.7211	0.6054	1.3800e-003	0.0286	0.0318	0.0604	4.9400e-003	0.0302	0.0352	0.0000	120.0492	120.0492	0.0231	0.0000	120.6260
Maximum	**0.9340**	**9.2243**	**7.5576**	**0.0152**	**0.1037**	**0.4410**	**0.5447**	**0.0232**	**0.4166**	**0.4398**	**0.0000**	**1,331.5555**	**1,331.5555**	**0.3091**	**0.0000**	**1,339.2840**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0113	0.0572	0.4469	7.7000e-004	0.0134	2.0000e-004	0.0136	2.2300e-003	2.0000e-004	2.4300e-003	0.0000	69.1978	69.1978	0.0146	0.0000	69.5638
2019	0.0763	0.4113	3.1395	5.3700e-003	0.0727	1.3800e-003	0.0741	0.0127	1.3600e-003	0.0141	0.0000	475.6355	475.6355	0.1051	0.0000	478.2629
2020	0.2115	1.1851	8.9987	0.0152	0.1037	3.8700e-003	0.1075	0.0232	3.8300e-003	0.0270	0.0000	1,331.5540	1,331.5540	0.3091	0.0000	1,339.2825
2021	0.0488	0.2852	2.0812	3.5000e-003	0.0295	8.9000e-004	0.0304	6.0600e-003	8.8000e-004	6.9400e-003	0.0000	306.2628	306.2628	0.0714	0.0000	308.0467
2022	0.0194	0.0938	0.7364	1.3800e-003	0.0286	3.6000e-004	0.0289	4.9400e-003	3.6000e-004	5.3000e-003	0.0000	120.0491	120.0491	0.0231	0.0000	120.6258
Maximum	**0.2115**	**1.1851**	**8.9987**	**0.0152**	**0.1037**	**3.8700e-003**	**0.1075**	**0.0232**	**3.8300e-003**	**0.0270**	**0.0000**	**1,331.5540**	**1,331.5540**	**0.3091**	**0.0000**	**1,339.2825**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e

North Bay Water Reuse Program Phase 2 - San Francisco Bay Area Air Basin, Annual

Percent Reduction	77.54	87.40	-18.47	0.00	0.00	99.14	75.13	0.00	99.10	92.87	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	10-1-2018	12-31-2018	0.6551	0.0691
3	1-1-2019	3-31-2019	1.2905	0.1569
4	4-1-2019	6-30-2019	0.5239	0.0586
5	7-1-2019	9-30-2019	0.4467	0.0489
6	10-1-2019	12-31-2019	1.7296	0.2211
7	1-1-2020	3-31-2020	4.5291	0.6240
8	4-1-2020	6-30-2020	3.4416	0.4689
9	7-1-2020	9-30-2020	1.2650	0.1758
10	10-1-2020	12-31-2020	0.8652	0.1218
11	1-1-2021	3-31-2021	0.7638	0.1188
12	4-1-2021	6-30-2021	0.6999	0.1118
13	7-1-2021	9-30-2021	0.3057	0.0521
14	10-1-2021	12-31-2021	0.3677	0.0512
15	1-1-2022	3-31-2022	0.4977	0.0718
16	4-1-2022	6-30-2022	0.2989	0.0419
		Highest	4.5291	0.6240

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.0000e-005**	**1.0000e-005**	**9.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.7900e-003**	**1.7900e-003**	**0.0000**	**0.0000**	**1.9000e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.0000e-005**	**1.0000e-005**	**9.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.7900e-003**	**1.7900e-003**	**0.0000**	**0.0000**	**1.9000e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation1	Site Preparation	10/26/2018	4/19/2019	5	126	Increase Soscol WRF Filter Capacity
2	Site Preparation2	Site Preparation	12/3/2018	4/9/2019	5	92	Recycled Water Distribution System Expansion – Phase 1
3	Site Preparation3	Site Preparation	4/20/2019	10/14/2019	5	126	Increase ECWRF Capacity
4	Site Preparation4	Site Preparation	10/15/2019	5/27/2021	5	423	Urban Recycled Water Expansion
5	Site Preparation5	Site Preparation	11/11/2019	7/13/2020	5	176	Agricultural Recycled Water Expansion – Phases 1 and 2
6	Site Preparation6	Site Preparation	12/2/2019	4/24/2020	5	105	Recycled Water Distribution System Expansion – Phase 2
7	Site Preparation7	Site Preparation	12/30/2019	8/19/2020	5	168	Soscol WRF Covered Storage
8	Site Preparation8	Site Preparation	1/6/2020	1/17/2020	5	10	Turnout to Wetlands
9	Site Preparation9	Site Preparation	1/6/2020	6/12/2020	5	115	Napa Road Pipeline
10	Site Preparation10	Site Preparation	1/6/2020	6/29/2020	5	126	Recycled Water Distribution System Expansion to San Quentin
11	Site Preparation11	Site Preparation	1/6/2020	1/20/2020	5	11	Recycled Water Distribution System Expansion to San Quentin
12	Site Preparation12	Site Preparation	1/6/2020	1/13/2020	5	6	Soscol WRF Covered Storage - Pipeline
13	Site Preparation13	Site Preparation	5/28/2021	8/17/2021	5	58	Marin County Lower Novato Creek - Distribution
14	Site Preparation14	Site Preparation	11/1/2021	4/25/2022	5	126	WRF Phase 2 Treatment Plant Upgrades
15	Site Preparation15	Site Preparation	11/1/2021	11/15/2021	5	11	WRF Phase 2 Treatment Plant Upgrades - Pipelines
16	Site Preparation16	Site Preparation	2/7/2022	6/2/2022	5	84	RWTF Treatment Capacity Expansion

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation1	Cranes	1	4.50	231	0.29
Site Preparation1	Forklifts	1	4.50	89	0.20
Site Preparation1	Generator Sets	1	8.00	84	0.74
Site Preparation1	Graders	1	2.00	187	0.41
Site Preparation1	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation1	Rubber Tired Loaders	1	2.00	203	0.36
Site Preparation1	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Site Preparation2	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation2	Cranes	1	6.00	231	0.29
Site Preparation2	Excavators	1	8.00	158	0.38
Site Preparation2	Generator Sets	1	8.00	84	0.74
Site Preparation2	Pavers	1	6.00	130	0.42
Site Preparation2	Rollers	1	6.00	80	0.38
Site Preparation2	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation2	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation3	Cranes	1	4.00	231	0.29
Site Preparation3	Forklifts	1	4.00	89	0.20
Site Preparation3	Generator Sets	1	8.00	84	0.74
Site Preparation3	Graders	1	2.70	187	0.41
Site Preparation3	Off-Highway Trucks	1	0.20	402	0.38
Site Preparation3	Rubber Tired Loaders	1	2.70	203	0.36
Site Preparation3	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Site Preparation4	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation4	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation4	Cranes	1	6.10	231	0.29
Site Preparation4	Excavators	1	9.20	158	0.38
Site Preparation4	Generator Sets	1	8.00	84	0.74
Site Preparation4	Pavers	1	6.00	130	0.42
Site Preparation4	Rollers	1	6.10	80	0.38
Site Preparation4	Rubber Tired Loaders	1	9.20	203	0.36
Site Preparation4	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation5	Bore/Drill Rigs	1	0.10	221	0.50
Site Preparation5	Concrete/Industrial Saws	1	6.00	81	0.73

Site Preparation5	Cranes	1	6.00	231	0.29
Site Preparation5	Excavators	1	8.40	158	0.38
Site Preparation5	Generator Sets	1	8.00	84	0.74
Site Preparation5	Pavers	1	6.00	130	0.42
Site Preparation5	Rollers	1	6.00	80	0.38
Site Preparation5	Rubber Tired Loaders	1	8.40	203	0.36
Site Preparation5	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation6	Bore/Drill Rigs	1	0.80	221	0.50
Site Preparation6	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation6	Cranes	1	6.30	231	0.29
Site Preparation6	Excavators	1	11.00	158	0.38
Site Preparation6	Generator Sets	1	8.00	84	0.74
Site Preparation6	Pavers	1	6.00	130	0.42
Site Preparation6	Rollers	1	6.30	80	0.38
Site Preparation6	Rubber Tired Loaders	1	11.00	203	0.36
Site Preparation6	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation7	Forklifts	1	3.00	89	0.20
Site Preparation7	Generator Sets	1	8.00	84	0.74
Site Preparation7	Graders	1	4.00	187	0.41
Site Preparation7	Off-Highway Trucks	1	4.00	402	0.38
Site Preparation7	Rollers	1	3.00	80	0.38
Site Preparation7	Rubber Tired Loaders	1	4.00	203	0.36
Site Preparation7	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation8	Concrete/Industrial Saws	0	0.00	81	0.73
Site Preparation8	Cranes	1	6.00	231	0.29
Site Preparation8	Excavators	1	8.00	158	0.38
Site Preparation8	Generator Sets	1	8.00	84	0.74
Site Preparation8	Pavers	0	0.00	130	0.42
Site Preparation8	Rollers	1	6.00	80	0.38
Site Preparation8	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation8	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation9	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation9	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation9	Cranes	1	6.10	231	0.29
Site Preparation9	Excavators	1	9.10	158	0.38

Site Preparation9	Generator Sets	1	8.00	84	0.74
Site Preparation9	Pavers	1	6.00	130	0.42
Site Preparation9	Rollers	1	6.10	80	0.38
Site Preparation9	Rubber Tired Loaders	1	9.10	203	0.36
Site Preparation9	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation10	Cranes	1	5.00	231	0.29
Site Preparation10	Forklifts	0	5.00	89	0.20
Site Preparation10	Generator Sets	1	8.00	84	0.74
Site Preparation10	Graders	1	1.30	187	0.41
Site Preparation10	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation10	Rubber Tired Loaders	1	1.30	203	0.36
Site Preparation10	Tractors/Loaders/Backhoes	1	1.30	97	0.37
Site Preparation11	Bore/Drill Rigs	1	0.30	221	0.50
Site Preparation11	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation11	Cranes	1	6.10	231	0.29
Site Preparation11	Excavators	1	9.10	158	0.38
Site Preparation11	Generator Sets	1	8.00	84	0.74
Site Preparation11	Pavers	1	6.00	130	0.42
Site Preparation11	Rollers	1	6.10	80	0.38
Site Preparation11	Rubber Tired Loaders	1	9.10	203	0.36
Site Preparation11	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation12	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation12	Cranes	1	6.00	231	0.29
Site Preparation12	Excavators	1	8.00	158	0.38
Site Preparation12	Generator Sets	1	8.00	84	0.74
Site Preparation12	Pavers	1	6.00	130	0.42
Site Preparation12	Rollers	1	6.00	80	0.38
Site Preparation12	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation12	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation13	Concrete/Industrial Saws	0	0.00	81	0.73
Site Preparation13	Cranes	1	6.00	231	0.29
Site Preparation13	Excavators	1	8.00	158	0.38
Site Preparation13	Generator Sets	1	8.00	84	0.74
Site Preparation13	Pavers	0	0.00	130	0.42
Site Preparation13	Rollers	1	6.00	80	0.38

Site Preparation13	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation13	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation14	Cranes	1	4.00	231	0.29
Site Preparation14	Forklifts	1	4.00	89	0.20
Site Preparation14	Generator Sets	1	8.00	84	0.74
Site Preparation14	Graders	1	2.70	187	0.41
Site Preparation14	Off-Highway Trucks	1	0.20	402	0.38
Site Preparation14	Rubber Tired Loaders	1	2.70	203	0.36
Site Preparation14	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Site Preparation15	Concrete/Industrial Saws	1	6.00	81	0.73
Site Preparation15	Cranes	1	6.00	231	0.29
Site Preparation15	Excavators	1	8.00	158	0.38
Site Preparation15	Generator Sets	1	8.00	84	0.74
Site Preparation15	Pavers	1	6.00	130	0.42
Site Preparation15	Rollers	1	6.00	80	0.38
Site Preparation15	Rubber Tired Loaders	1	8.00	203	0.36
Site Preparation15	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation16	Cranes	1	4.50	231	0.29
Site Preparation16	Forklifts	1	4.50	89	0.20
Site Preparation16	Generator Sets	1	8.00	84	0.74
Site Preparation16	Graders	1	2.00	187	0.41
Site Preparation16	Off-Highway Trucks	1	0.10	402	0.38
Site Preparation16	Rubber Tired Loaders	1	2.00	203	0.36
Site Preparation16	Tractors/Loaders/Backhoes	1	2.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation1	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation2	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation3	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation4	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation5	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation6	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation7	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation8	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation9	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation10	6	15.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation11	9	23.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation12	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation13	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation14	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation15	8	20.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation16	7	18.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

3.2 Site Preparation1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.3500e-003	0.0000	8.3500e-003	9.0000e-004	0.0000	9.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0291	0.2987	0.1738	3.5000e-004		0.0153	0.0153		0.0146	0.0146	0.0000	31.0326	31.0326	6.4800e-003	0.0000	31.1947
Total	**0.0291**	**0.2987**	**0.1738**	**3.5000e-004**	**8.3500e-003**	**0.0153**	**0.0237**	**9.0000e-004**	**0.0146**	**0.0155**	**0.0000**	**31.0326**	**31.0326**	**6.4800e-003**	**0.0000**	**31.1947**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-003	1.3000e-003	0.0131	3.0000e-005	3.3400e-003	2.0000e-005	3.3700e-003	8.9000e-004	2.0000e-005	9.1000e-004	0.0000	3.1170	3.1170	9.0000e-005	0.0000	3.1193
Total	**1.7000e-003**	**1.3000e-003**	**0.0131**	**3.0000e-005**	**3.3400e-003**	**2.0000e-005**	**3.3700e-003**	**8.9000e-004**	**2.0000e-005**	**9.1000e-004**	**0.0000**	**3.1170**	**3.1170**	**9.0000e-005**	**0.0000**	**3.1193**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.3500e-003	0.0000	8.3500e-003	9.0000e-004	0.0000	9.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1200e-003	0.0240	0.1947	3.5000e-004		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	31.0325	31.0325	6.4800e-003	0.0000	31.1946
Total	**4.1200e-003**	**0.0240**	**0.1947**	**3.5000e-004**	**8.3500e-003**	**8.0000e-005**	**8.4300e-003**	**9.0000e-004**	**8.0000e-005**	**9.8000e-004**	**0.0000**	**31.0325**	**31.0325**	**6.4800e-003**	**0.0000**	**31.1946**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-003	1.3000e-003	0.0131	3.0000e-005	3.3400e-003	2.0000e-005	3.3700e-003	8.9000e-004	2.0000e-005	9.1000e-004	0.0000	3.1170	3.1170	9.0000e-005	0.0000	3.1193
Total	**1.7000e-003**	**1.3000e-003**	**0.0131**	**3.0000e-005**	**3.3400e-003**	**2.0000e-005**	**3.3700e-003**	**8.9000e-004**	**2.0000e-005**	**9.1000e-004**	**0.0000**	**3.1170**	**3.1170**	**9.0000e-005**	**0.0000**	**3.1193**

3.2 Site Preparation1 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.3500e-003	0.0000	8.3500e-003	9.0000e-004	0.0000	9.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0437	0.4537	0.2840	5.9000e-004		0.0224	0.0224		0.0213	0.0213	0.0000	51.6651	51.6651	0.0107	0.0000	51.9325
Total	**0.0437**	**0.4537**	**0.2840**	**5.9000e-004**	**8.3500e-003**	**0.0224**	**0.0307**	**9.0000e-004**	**0.0213**	**0.0222**	**0.0000**	**51.6651**	**51.6651**	**0.0107**	**0.0000**	**51.9325**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5800e-003	1.9100e-003	0.0195	6.0000e-005	5.6200e-003	4.0000e-005	5.6600e-003	1.4900e-003	4.0000e-005	1.5300e-003	0.0000	5.0820	5.0820	1.4000e-004	0.0000	5.0854
Total	**2.5800e-003**	**1.9100e-003**	**0.0195**	**6.0000e-005**	**5.6200e-003**	**4.0000e-005**	**5.6600e-003**	**1.4900e-003**	**4.0000e-005**	**1.5300e-003**	**0.0000**	**5.0820**	**5.0820**	**1.4000e-004**	**0.0000**	**5.0854**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.3500e-003	0.0000	8.3500e-003	9.0000e-004	0.0000	9.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.9200e-003	0.0404	0.3272	5.9000e-004		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	51.6651	51.6651	0.0107	0.0000	51.9325
Total	**6.9200e-003**	**0.0404**	**0.3272**	**5.9000e-004**	**8.3500e-003**	**1.3000e-004**	**8.4800e-003**	**9.0000e-004**	**1.3000e-004**	**1.0300e-003**	**0.0000**	**51.6651**	**51.6651**	**0.0107**	**0.0000**	**51.9325**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5800e-003	1.9100e-003	0.0195	6.0000e-005	5.6200e-003	4.0000e-005	5.6600e-003	1.4900e-003	4.0000e-005	1.5300e-003	0.0000	5.0820	5.0820	1.4000e-004	0.0000	5.0854
Total	**2.5800e-003**	**1.9100e-003**	**0.0195**	**6.0000e-005**	**5.6200e-003**	**4.0000e-005**	**5.6600e-003**	**1.4900e-003**	**4.0000e-005**	**1.5300e-003**	**0.0000**	**5.0820**	**5.0820**	**1.4000e-004**	**0.0000**	**5.0854**

3.3 Site Preparation2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0288	0.2918	0.2040	3.7000e-004		0.0154	0.0154		0.0145	0.0145	0.0000	33.5008	33.5008	8.0200e-003	0.0000	33.7013
Total	**0.0288**	**0.2918**	**0.2040**	**3.7000e-004**	**0.0000**	**0.0154**	**0.0154**	**0.0000**	**0.0145**	**0.0145**	**0.0000**	**33.5008**	**33.5008**	**8.0200e-003**	**0.0000**	**33.7013**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	6.4000e-004	6.4900e-003	2.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5474	1.5474	5.0000e-005	0.0000	1.5486
Total	**8.4000e-004**	**6.4000e-004**	**6.4900e-003**	**2.0000e-005**	**1.6600e-003**	**1.0000e-005**	**1.6700e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5474**	**1.5474**	**5.0000e-005**	**0.0000**	**1.5486**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6600e-003	0.0313	0.2326	3.7000e-004		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	33.5008	33.5008	8.0200e-003	0.0000	33.7013
Total	**4.6600e-003**	**0.0313**	**0.2326**	**3.7000e-004**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**33.5008**	**33.5008**	**8.0200e-003**	**0.0000**	**33.7013**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.4000e-004	6.4000e-004	6.4900e-003	2.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5474	1.5474	5.0000e-005	0.0000	1.5486
Total	**8.4000e-004**	**6.4000e-004**	**6.4900e-003**	**2.0000e-005**	**1.6600e-003**	**1.0000e-005**	**1.6700e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5474**	**1.5474**	**5.0000e-005**	**0.0000**	**1.5486**

3.3 Site Preparation2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0869	0.8820	0.6770	1.2600e-003		0.0448	0.0448		0.0423	0.0423	0.0000	111.9867	111.9867	0.0268	0.0000	112.6575
Total	**0.0869**	**0.8820**	**0.6770**	**1.2600e-003**	**0.0000**	**0.0448**	**0.0448**	**0.0000**	**0.0423**	**0.0423**	**0.0000**	**111.9867**	**111.9867**	**0.0268**	**0.0000**	**112.6575**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5700e-003	1.9100e-003	0.0195	6.0000e-005	5.6100e-003	4.0000e-005	5.6500e-003	1.4900e-003	4.0000e-005	1.5300e-003	0.0000	5.0749	5.0749	1.4000e-004	0.0000	5.0783
Total	**2.5700e-003**	**1.9100e-003**	**0.0195**	**6.0000e-005**	**5.6100e-003**	**4.0000e-005**	**5.6500e-003**	**1.4900e-003**	**4.0000e-005**	**1.5300e-003**	**0.0000**	**5.0749**	**5.0749**	**1.4000e-004**	**0.0000**	**5.0783**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0158	0.1057	0.7865	1.2600e-003		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	111.9866	111.9866	0.0268	0.0000	112.6574
Total	**0.0158**	**0.1057**	**0.7865**	**1.2600e-003**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**111.9866**	**111.9866**	**0.0268**	**0.0000**	**112.6574**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5700e-003	1.9100e-003	0.0195	6.0000e-005	5.6100e-003	4.0000e-005	5.6500e-003	1.4900e-003	4.0000e-005	1.5300e-003	0.0000	5.0749	5.0749	1.4000e-004	0.0000	5.0783
Total	**2.5700e-003**	**1.9100e-003**	**0.0195**	**6.0000e-005**	**5.6100e-003**	**4.0000e-005**	**5.6500e-003**	**1.4900e-003**	**4.0000e-005**	**1.5300e-003**	**0.0000**	**5.0749**	**5.0749**	**1.4000e-004**	**0.0000**	**5.0783**

3.4 Site Preparation3 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0738	0.7758	0.4744	1.0100e-003		0.0374	0.0374		0.0355	0.0355	0.0000	88.6772	88.6772	0.0191	0.0000	89.1533
Total	**0.0738**	**0.7758**	**0.4744**	**1.0100e-003**	**0.0113**	**0.0374**	**0.0487**	**1.2200e-003**	**0.0355**	**0.0368**	**0.0000**	**88.6772**	**88.6772**	**0.0191**	**0.0000**	**89.1533**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1100e-003	3.0500e-003	0.0311	9.0000e-005	8.9600e-003	6.0000e-005	9.0200e-003	2.3800e-003	6.0000e-005	2.4400e-003	0.0000	8.1055	8.1055	2.2000e-004	0.0000	8.1109
Total	**4.1100e-003**	**3.0500e-003**	**0.0311**	**9.0000e-005**	**8.9600e-003**	**6.0000e-005**	**9.0200e-003**	**2.3800e-003**	**6.0000e-005**	**2.4400e-003**	**0.0000**	**8.1055**	**8.1055**	**2.2000e-004**	**0.0000**	**8.1109**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0121	0.0747	0.5567	1.0100e-003		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	88.6771	88.6771	0.0191	0.0000	89.1532
Total	**0.0121**	**0.0747**	**0.5567**	**1.0100e-003**	**0.0113**	**2.3000e-004**	**0.0115**	**1.2200e-003**	**2.3000e-004**	**1.4500e-003**	**0.0000**	**88.6771**	**88.6771**	**0.0191**	**0.0000**	**89.1532**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1100e-003	3.0500e-003	0.0311	9.0000e-005	8.9600e-003	6.0000e-005	9.0200e-003	2.3800e-003	6.0000e-005	2.4400e-003	0.0000	8.1055	8.1055	2.2000e-004	0.0000	8.1109
Total	**4.1100e-003**	**3.0500e-003**	**0.0311**	**9.0000e-005**	**8.9600e-003**	**6.0000e-005**	**9.0200e-003**	**2.3800e-003**	**6.0000e-005**	**2.4400e-003**	**0.0000**	**8.1055**	**8.1055**	**2.2000e-004**	**0.0000**	**8.1109**

3.5 Site Preparation4 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0718	0.7339	0.5584	1.0600e-003		0.0368	0.0368		0.0347	0.0347	0.0000	93.7798	93.7798	0.0229	0.0000	94.3521
Total	**0.0718**	**0.7339**	**0.5584**	**1.0600e-003**	**0.0000**	**0.0368**	**0.0368**	**0.0000**	**0.0347**	**0.0347**	**0.0000**	**93.7798**	**93.7798**	**0.0229**	**0.0000**	**94.3521**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3300e-003	1.7300e-003	0.0176	5.0000e-005	5.0900e-003	4.0000e-005	5.1200e-003	1.3500e-003	3.0000e-005	1.3900e-003	0.0000	4.6031	4.6031	1.2000e-004	0.0000	4.6062
Total	**2.3300e-003**	**1.7300e-003**	**0.0176**	**5.0000e-005**	**5.0900e-003**	**4.0000e-005**	**5.1200e-003**	**1.3500e-003**	**3.0000e-005**	**1.3900e-003**	**0.0000**	**4.6031**	**4.6031**	**1.2000e-004**	**0.0000**	**4.6062**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0132	0.0866	0.6548	1.0600e-003		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	93.7797	93.7797	0.0229	0.0000	94.3520
Total	**0.0132**	**0.0866**	**0.6548**	**1.0600e-003**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**93.7797**	**93.7797**	**0.0229**	**0.0000**	**94.3520**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3300e-003	1.7300e-003	0.0176	5.0000e-005	5.0900e-003	4.0000e-005	5.1200e-003	1.3500e-003	3.0000e-005	1.3900e-003	0.0000	4.6031	4.6031	1.2000e-004	0.0000	4.6062
Total	**2.3300e-003**	**1.7300e-003**	**0.0176**	**5.0000e-005**	**5.0900e-003**	**4.0000e-005**	**5.1200e-003**	**1.3500e-003**	**3.0000e-005**	**1.3900e-003**	**0.0000**	**4.6031**	**4.6031**	**1.2000e-004**	**0.0000**	**4.6062**

3.5 Site Preparation4 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3073	3.1232	2.5803	4.9500e-003		0.1517	0.1517		0.1431	0.1431	0.0000	431.9576	431.9576	0.1062	0.0000	434.6123
Total	**0.3073**	**3.1232**	**2.5803**	**4.9500e-003**	**0.0000**	**0.1517**	**0.1517**	**0.0000**	**0.1431**	**0.1431**	**0.0000**	**431.9576**	**431.9576**	**0.1062**	**0.0000**	**434.6123**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.9900e-003	7.1500e-003	0.0740	2.3000e-004	0.0238	1.6000e-004	0.0240	6.3300e-003	1.5000e-004	6.4800e-003	0.0000	20.8584	20.8584	5.0000e-004	0.0000	20.8710
Total	**9.9900e-003**	**7.1500e-003**	**0.0740**	**2.3000e-004**	**0.0238**	**1.6000e-004**	**0.0240**	**6.3300e-003**	**1.5000e-004**	**6.4800e-003**	**0.0000**	**20.8584**	**20.8584**	**5.0000e-004**	**0.0000**	**20.8710**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0617	0.4051	3.0637	4.9500e-003		1.1500e-003	1.1500e-003		1.1500e-003	1.1500e-003	0.0000	431.9571	431.9571	0.1062	0.0000	434.6118
Total	**0.0617**	**0.4051**	**3.0637**	**4.9500e-003**	**0.0000**	**1.1500e-003**	**1.1500e-003**	**0.0000**	**1.1500e-003**	**1.1500e-003**	**0.0000**	**431.9571**	**431.9571**	**0.1062**	**0.0000**	**434.6118**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.9900e-003	7.1500e-003	0.0740	2.3000e-004	0.0238	1.6000e-004	0.0240	6.3300e-003	1.5000e-004	6.4800e-003	0.0000	20.8584	20.8584	5.0000e-004	0.0000	20.8710
Total	**9.9900e-003**	**7.1500e-003**	**0.0740**	**2.3000e-004**	**0.0238**	**1.6000e-004**	**0.0240**	**6.3300e-003**	**1.5000e-004**	**6.4800e-003**	**0.0000**	**20.8584**	**20.8584**	**5.0000e-004**	**0.0000**	**20.8710**

3.5 Site Preparation4 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1126	1.1279	1.0239	1.9800e-003		0.0533	0.0533		0.0503	0.0503	0.0000	173.1222	173.1222	0.0423	0.0000	174.1794
Total	**0.1126**	**1.1279**	**1.0239**	**1.9800e-003**	**0.0000**	**0.0533**	**0.0533**	**0.0000**	**0.0503**	**0.0503**	**0.0000**	**173.1222**	**173.1222**	**0.0423**	**0.0000**	**174.1794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7100e-003	2.5600e-003	0.0271	9.0000e-005	9.5400e-003	6.0000e-005	9.6000e-003	2.5400e-003	6.0000e-005	2.6000e-003	0.0000	8.0660	8.0660	1.8000e-004	0.0000	8.0705
Total	**3.7100e-003**	**2.5600e-003**	**0.0271**	**9.0000e-005**	**9.5400e-003**	**6.0000e-005**	**9.6000e-003**	**2.5400e-003**	**6.0000e-005**	**2.6000e-003**	**0.0000**	**8.0660**	**8.0660**	**1.8000e-004**	**0.0000**	**8.0705**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0247	0.1624	1.2278	1.9800e-003		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	173.1220	173.1220	0.0423	0.0000	174.1792
Total	**0.0247**	**0.1624**	**1.2278**	**1.9800e-003**	**0.0000**	**4.6000e-004**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**4.6000e-004**	**0.0000**	**173.1220**	**173.1220**	**0.0423**	**0.0000**	**174.1792**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7100e-003	2.5600e-003	0.0271	9.0000e-005	9.5400e-003	6.0000e-005	9.6000e-003	2.5400e-003	6.0000e-005	2.6000e-003	0.0000	8.0660	8.0660	1.8000e-004	0.0000	8.0705
Total	**3.7100e-003**	**2.5600e-003**	**0.0271**	**9.0000e-005**	**9.5400e-003**	**6.0000e-005**	**9.6000e-003**	**2.5400e-003**	**6.0000e-005**	**2.6000e-003**	**0.0000**	**8.0660**	**8.0660**	**1.8000e-004**	**0.0000**	**8.0705**

3.6 Site Preparation5 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0459	0.4674	0.3579	6.7000e-004		0.0236	0.0236		0.0223	0.0223	0.0000	59.5020	59.5020	0.0143	0.0000	59.8606
Total	**0.0459**	**0.4674**	**0.3579**	**6.7000e-004**	**0.0000**	**0.0236**	**0.0236**	**0.0000**	**0.0223**	**0.0223**	**0.0000**	**59.5020**	**59.5020**	**0.0143**	**0.0000**	**59.8606**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5400e-003	1.1400e-003	0.0117	3.0000e-005	3.3600e-003	2.0000e-005	3.3900e-003	8.9000e-004	2.0000e-005	9.2000e-004	0.0000	3.0414	3.0414	8.0000e-005	0.0000	3.0434
Total	**1.5400e-003**	**1.1400e-003**	**0.0117**	**3.0000e-005**	**3.3600e-003**	**2.0000e-005**	**3.3900e-003**	**8.9000e-004**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**3.0414**	**3.0414**	**8.0000e-005**	**0.0000**	**3.0434**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.3700e-003	0.0557	0.4171	6.7000e-004		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	59.5019	59.5019	0.0143	0.0000	59.8605
Total	**8.3700e-003**	**0.0557**	**0.4171**	**6.7000e-004**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**59.5019**	**59.5019**	**0.0143**	**0.0000**	**59.8605**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5400e-003	1.1400e-003	0.0117	3.0000e-005	3.3600e-003	2.0000e-005	3.3900e-003	8.9000e-004	2.0000e-005	9.2000e-004	0.0000	3.0414	3.0414	8.0000e-005	0.0000	3.0434
Total	**1.5400e-003**	**1.1400e-003**	**0.0117**	**3.0000e-005**	**3.3600e-003**	**2.0000e-005**	**3.3900e-003**	**8.9000e-004**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**3.0414**	**3.0414**	**8.0000e-005**	**0.0000**	**3.0434**

3.6 Site Preparation5 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1577	1.5969	1.3278	2.5200e-003		0.0781	0.0781		0.0738	0.0738	0.0000	220.1250	220.1250	0.0534	0.0000	221.4602
Total	**0.1577**	**1.5969**	**1.3278**	**2.5200e-003**	**0.0000**	**0.0781**	**0.0781**	**0.0000**	**0.0738**	**0.0738**	**0.0000**	**220.1250**	**220.1250**	**0.0534**	**0.0000**	**221.4602**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	3.7900e-003	0.0393	1.2000e-004	0.0126	9.0000e-005	0.0127	3.3600e-003	8.0000e-005	3.4400e-003	0.0000	11.0661	11.0661	2.7000e-004	0.0000	11.0728
Total	**5.3000e-003**	**3.7900e-003**	**0.0393**	**1.2000e-004**	**0.0126**	**9.0000e-005**	**0.0127**	**3.3600e-003**	**8.0000e-005**	**3.4400e-003**	**0.0000**	**11.0661**	**11.0661**	**2.7000e-004**	**0.0000**	**11.0728**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0314	0.2094	1.5670	2.5200e-003		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	220.1247	220.1247	0.0534	0.0000	221.4600
Total	**0.0314**	**0.2094**	**1.5670**	**2.5200e-003**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**220.1247**	**220.1247**	**0.0534**	**0.0000**	**221.4600**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	3.7900e-003	0.0393	1.2000e-004	0.0126	9.0000e-005	0.0127	3.3600e-003	8.0000e-005	3.4400e-003	0.0000	11.0661	11.0661	2.7000e-004	0.0000	11.0728
Total	**5.3000e-003**	**3.7900e-003**	**0.0393**	**1.2000e-004**	**0.0126**	**9.0000e-005**	**0.0127**	**3.3600e-003**	**8.0000e-005**	**3.4400e-003**	**0.0000**	**11.0661**	**11.0661**	**2.7000e-004**	**0.0000**	**11.0728**

3.7 Site Preparation6 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0302	0.3117	0.2342	4.5000e-004		0.0154	0.0154		0.0145	0.0145	0.0000	40.1647	40.1647	0.0100	0.0000	40.4158
Total	**0.0302**	**0.3117**	**0.2342**	**4.5000e-004**	**0.0000**	**0.0154**	**0.0154**	**0.0000**	**0.0145**	**0.0145**	**0.0000**	**40.1647**	**40.1647**	**0.0100**	**0.0000**	**40.4158**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	6.8000e-004	6.9300e-003	2.0000e-005	2.0000e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.8084	1.8084	5.0000e-005	0.0000	1.8096
Total	**9.2000e-004**	**6.8000e-004**	**6.9300e-003**	**2.0000e-005**	**2.0000e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**1.8084**	**1.8084**	**5.0000e-005**	**0.0000**	**1.8096**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6300e-003	0.0360	0.2782	4.5000e-004		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	40.1647	40.1647	0.0100	0.0000	40.4157
Total	**5.6300e-003**	**0.0360**	**0.2782**	**4.5000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**40.1647**	**40.1647**	**0.0100**	**0.0000**	**40.4157**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.2000e-004	6.8000e-004	6.9300e-003	2.0000e-005	2.0000e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.8084	1.8084	5.0000e-005	0.0000	1.8096
Total	**9.2000e-004**	**6.8000e-004**	**6.9300e-003**	**2.0000e-005**	**2.0000e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**1.8084**	**1.8084**	**5.0000e-005**	**0.0000**	**1.8096**

3.7 Site Preparation6 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1045	1.0700	0.8728	1.7100e-003		0.0511	0.0511		0.0482	0.0482	0.0000	149.1100	149.1100	0.0376	0.0000	150.0502
Total	**0.1045**	**1.0700**	**0.8728**	**1.7100e-003**	**0.0000**	**0.0511**	**0.0511**	**0.0000**	**0.0482**	**0.0482**	**0.0000**	**149.1100**	**149.1100**	**0.0376**	**0.0000**	**150.0502**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1600e-003	2.2600e-003	0.0234	7.0000e-005	7.5400e-003	5.0000e-005	7.5900e-003	2.0100e-003	5.0000e-005	2.0500e-003	0.0000	6.6078	6.6078	1.6000e-004	0.0000	6.6118
Total	**3.1600e-003**	**2.2600e-003**	**0.0234**	**7.0000e-005**	**7.5400e-003**	**5.0000e-005**	**7.5900e-003**	**2.0100e-003**	**5.0000e-005**	**2.0500e-003**	**0.0000**	**6.6078**	**6.6078**	**1.6000e-004**	**0.0000**	**6.6118**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0213	0.1358	1.0495	1.7100e-003		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	149.1098	149.1098	0.0376	0.0000	150.0500
Total	**0.0213**	**0.1358**	**1.0495**	**1.7100e-003**	**0.0000**	**4.0000e-004**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**4.0000e-004**	**0.0000**	**149.1098**	**149.1098**	**0.0376**	**0.0000**	**150.0500**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1600e-003	2.2600e-003	0.0234	7.0000e-005	7.5400e-003	5.0000e-005	7.5900e-003	2.0100e-003	5.0000e-005	2.0500e-003	0.0000	6.6078	6.6078	1.6000e-004	0.0000	6.6118
Total	**3.1600e-003**	**2.2600e-003**	**0.0234**	**7.0000e-005**	**7.5400e-003**	**5.0000e-005**	**7.5900e-003**	**2.0100e-003**	**5.0000e-005**	**2.0500e-003**	**0.0000**	**6.6078**	**6.6078**	**1.6000e-004**	**0.0000**	**6.6118**

3.8 Site Preparation7 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0223	0.0000	0.0223	2.4000e-003	0.0000	2.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-003	0.0156	9.7900e-003	2.0000e-005		7.2000e-004	7.2000e-004		6.8000e-004	6.8000e-004	0.0000	2.0167	2.0167	5.0000e-004	0.0000	2.0291
Total	**1.5000e-003**	**0.0156**	**9.7900e-003**	**2.0000e-005**	**0.0223**	**7.2000e-004**	**0.0230**	**2.4000e-003**	**6.8000e-004**	**3.0800e-003**	**0.0000**	**2.0167**	**2.0167**	**5.0000e-004**	**0.0000**	**2.0291**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	4.9000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1287	0.1287	0.0000	0.0000	0.1287
Total	**7.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1287**	**0.1287**	**0.0000**	**0.0000**	**0.1287**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0223	0.0000	0.0223	2.4000e-003	0.0000	2.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8000e-004	1.7400e-003	0.0123	2.0000e-005		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.0167	2.0167	5.0000e-004	0.0000	2.0291
Total	**2.8000e-004**	**1.7400e-003**	**0.0123**	**2.0000e-005**	**0.0223**	**1.0000e-005**	**0.0223**	**2.4000e-003**	**1.0000e-005**	**2.4100e-003**	**0.0000**	**2.0167**	**2.0167**	**5.0000e-004**	**0.0000**	**2.0291**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	4.9000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1287	0.1287	0.0000	0.0000	0.1287
Total	**7.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1287**	**0.1287**	**0.0000**	**0.0000**	**0.1287**

3.8 Site Preparation7 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0223	0.0000	0.0223	2.4000e-003	0.0000	2.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1156	1.1892	0.7991	1.8900e-003		0.0530	0.0530		0.0500	0.0500	0.0000	164.7074	164.7074	0.0407	0.0000	165.7259
Total	**0.1156**	**1.1892**	**0.7991**	**1.8900e-003**	**0.0223**	**0.0530**	**0.0753**	**2.4000e-003**	**0.0500**	**0.0524**	**0.0000**	**164.7074**	**164.7074**	**0.0407**	**0.0000**	**165.7259**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9500e-003	3.5400e-003	0.0367	1.1000e-004	0.0118	8.0000e-005	0.0119	3.1400e-003	7.0000e-005	3.2100e-003	0.0000	10.3427	10.3427	2.5000e-004	0.0000	10.3489
Total	**4.9500e-003**	**3.5400e-003**	**0.0367**	**1.1000e-004**	**0.0118**	**8.0000e-005**	**0.0119**	**3.1400e-003**	**7.0000e-005**	**3.2100e-003**	**0.0000**	**10.3427**	**10.3427**	**2.5000e-004**	**0.0000**	**10.3489**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0223	0.0000	0.0223	2.4000e-003	0.0000	2.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0232	0.1443	1.0189	1.8900e-003		4.4000e-004	4.4000e-004		4.4000e-004	4.4000e-004	0.0000	164.7072	164.7072	0.0407	0.0000	165.7257
Total	**0.0232**	**0.1443**	**1.0189**	**1.8900e-003**	**0.0223**	**4.4000e-004**	**0.0227**	**2.4000e-003**	**4.4000e-004**	**2.8400e-003**	**0.0000**	**164.7072**	**164.7072**	**0.0407**	**0.0000**	**165.7257**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9500e-003	3.5400e-003	0.0367	1.1000e-004	0.0118	8.0000e-005	0.0119	3.1400e-003	7.0000e-005	3.2100e-003	0.0000	10.3427	10.3427	2.5000e-004	0.0000	10.3489
Total	**4.9500e-003**	**3.5400e-003**	**0.0367**	**1.1000e-004**	**0.0118**	**8.0000e-005**	**0.0119**	**3.1400e-003**	**7.0000e-005**	**3.2100e-003**	**0.0000**	**10.3427**	**10.3427**	**2.5000e-004**	**0.0000**	**10.3489**

3.9 Site Preparation8 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6200e-003	0.0901	0.0695	1.4000e-004		4.2900e-003	4.2900e-003		4.0300e-003	4.0300e-003	0.0000	11.9691	11.9691	3.1200e-003	0.0000	12.0470
Total	**8.6200e-003**	**0.0901**	**0.0695**	**1.4000e-004**	**0.0000**	**4.2900e-003**	**4.2900e-003**	**0.0000**	**4.0300e-003**	**4.0300e-003**	**0.0000**	**11.9691**	**11.9691**	**3.1200e-003**	**0.0000**	**12.0470**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.4000e-004	2.4600e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6923	0.6923	2.0000e-005	0.0000	0.6927
Total	**3.3000e-004**	**2.4000e-004**	**2.4600e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6923**	**0.6923**	**2.0000e-005**	**0.0000**	**0.6927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7700e-003	0.0129	0.0830	1.4000e-004		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	11.9690	11.9690	3.1200e-003	0.0000	12.0469
Total	**1.7700e-003**	**0.0129**	**0.0830**	**1.4000e-004**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**11.9690**	**11.9690**	**3.1200e-003**	**0.0000**	**12.0469**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.4000e-004	2.4600e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6923	0.6923	2.0000e-005	0.0000	0.6927
Total	**3.3000e-004**	**2.4000e-004**	**2.4600e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6923**	**0.6923**	**2.0000e-005**	**0.0000**	**0.6927**

3.10 Site Preparation9 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1345	1.3660	1.1291	2.1600e-003		0.0664	0.0664		0.0627	0.0627	0.0000	188.8790	188.8790	0.0464	0.0000	190.0384
Total	**0.1345**	**1.3660**	**1.1291**	**2.1600e-003**	**0.0000**	**0.0664**	**0.0664**	**0.0000**	**0.0627**	**0.0627**	**0.0000**	**188.8790**	**188.8790**	**0.0464**	**0.0000**	**190.0384**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3800e-003	3.1400e-003	0.0325	1.0000e-004	0.0105	7.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	9.1554	9.1554	2.2000e-004	0.0000	9.1610
Total	**4.3800e-003**	**3.1400e-003**	**0.0325**	**1.0000e-004**	**0.0105**	**7.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**9.1554**	**9.1554**	**2.2000e-004**	**0.0000**	**9.1610**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0270	0.1774	1.3399	2.1600e-003		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	188.8788	188.8788	0.0464	0.0000	190.0382
Total	**0.0270**	**0.1774**	**1.3399**	**2.1600e-003**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**188.8788**	**188.8788**	**0.0464**	**0.0000**	**190.0382**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3800e-003	3.1400e-003	0.0325	1.0000e-004	0.0105	7.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	9.1554	9.1554	2.2000e-004	0.0000	9.1610
Total	**4.3800e-003**	**3.1400e-003**	**0.0325**	**1.0000e-004**	**0.0105**	**7.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**9.1554**	**9.1554**	**2.2000e-004**	**0.0000**	**9.1610**

3.11 Site Preparation10 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4300e-003	0.0000	5.4300e-003	5.9000e-004	0.0000	5.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0544	0.5679	0.3784	8.2000e-004		0.0262	0.0262		0.0251	0.0251	0.0000	70.8645	70.8645	0.0134	0.0000	71.1997
Total	**0.0544**	**0.5679**	**0.3784**	**8.2000e-004**	**5.4300e-003**	**0.0262**	**0.0317**	**5.9000e-004**	**0.0251**	**0.0257**	**0.0000**	**70.8645**	**70.8645**	**0.0134**	**0.0000**	**71.1997**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.2400e-003	0.0232	7.0000e-005	7.4700e-003	5.0000e-005	7.5200e-003	1.9900e-003	5.0000e-005	2.0300e-003	0.0000	6.5421	6.5421	1.6000e-004	0.0000	6.5460
Total	**3.1300e-003**	**2.2400e-003**	**0.0232**	**7.0000e-005**	**7.4700e-003**	**5.0000e-005**	**7.5200e-003**	**1.9900e-003**	**5.0000e-005**	**2.0300e-003**	**0.0000**	**6.5421**	**6.5421**	**1.6000e-004**	**0.0000**	**6.5460**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4300e-003	0.0000	5.4300e-003	5.9000e-004	0.0000	5.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.4000e-003	0.0515	0.4460	8.2000e-004		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	70.8644	70.8644	0.0134	0.0000	71.1996
Total	**9.4000e-003**	**0.0515**	**0.4460**	**8.2000e-004**	**5.4300e-003**	**1.8000e-004**	**5.6100e-003**	**5.9000e-004**	**1.8000e-004**	**7.7000e-004**	**0.0000**	**70.8644**	**70.8644**	**0.0134**	**0.0000**	**71.1996**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.2400e-003	0.0232	7.0000e-005	7.4700e-003	5.0000e-005	7.5200e-003	1.9900e-003	5.0000e-005	2.0300e-003	0.0000	6.5421	6.5421	1.6000e-004	0.0000	6.5460
Total	**3.1300e-003**	**2.2400e-003**	**0.0232**	**7.0000e-005**	**7.4700e-003**	**5.0000e-005**	**7.5200e-003**	**1.9900e-003**	**5.0000e-005**	**2.0300e-003**	**0.0000**	**6.5421**	**6.5421**	**1.6000e-004**	**0.0000**	**6.5460**

3.12 Site Preparation11 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0129	0.1307	0.1080	2.1000e-004		6.3500e-003	6.3500e-003		5.9900e-003	5.9900e-003	0.0000	18.0667	18.0667	4.4400e-003	0.0000	18.1776
Total	**0.0129**	**0.1307**	**0.1080**	**2.1000e-004**	**0.0000**	**6.3500e-003**	**6.3500e-003**	**0.0000**	**5.9900e-003**	**5.9900e-003**	**0.0000**	**18.0667**	**18.0667**	**4.4400e-003**	**0.0000**	**18.1776**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.0000e-004	3.1100e-003	1.0000e-005	1.0000e-003	1.0000e-005	1.0100e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.8757	0.8757	2.0000e-005	0.0000	0.8763
Total	**4.2000e-004**	**3.0000e-004**	**3.1100e-003**	**1.0000e-005**	**1.0000e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8757**	**0.8757**	**2.0000e-005**	**0.0000**	**0.8763**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5800e-003	0.0170	0.1282	2.1000e-004		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	18.0667	18.0667	4.4400e-003	0.0000	18.1776
Total	**2.5800e-003**	**0.0170**	**0.1282**	**2.1000e-004**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**18.0667**	**18.0667**	**4.4400e-003**	**0.0000**	**18.1776**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.0000e-004	3.1100e-003	1.0000e-005	1.0000e-003	1.0000e-005	1.0100e-003	2.7000e-004	1.0000e-005	2.7000e-004	0.0000	0.8757	0.8757	2.0000e-005	0.0000	0.8763
Total	**4.2000e-004**	**3.0000e-004**	**3.1100e-003**	**1.0000e-005**	**1.0000e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8757**	**0.8757**	**2.0000e-005**	**0.0000**	**0.8763**

3.13 Site Preparation12 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7000e-003	0.0678	0.0565	1.1000e-004		3.3300e-003	3.3300e-003		3.1500e-003	3.1500e-003	0.0000	9.3204	9.3204	2.2500e-003	0.0000	9.3766
Total	**6.7000e-003**	**0.0678**	**0.0565**	**1.1000e-004**	**0.0000**	**3.3300e-003**	**3.3300e-003**	**0.0000**	**3.1500e-003**	**3.1500e-003**	**0.0000**	**9.3204**	**9.3204**	**2.2500e-003**	**0.0000**	**9.3766**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.4000e-004	1.4700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4154	0.4154	1.0000e-005	0.0000	0.4156
Total	**2.0000e-004**	**1.4000e-004**	**1.4700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4154**	**0.4154**	**1.0000e-005**	**0.0000**	**0.4156**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	8.9300e-003	0.0665	1.1000e-004		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.3204	9.3204	2.2500e-003	0.0000	9.3766
Total	**1.3300e-003**	**8.9300e-003**	**0.0665**	**1.1000e-004**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.3204**	**9.3204**	**2.2500e-003**	**0.0000**	**9.3766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.4000e-004	1.4700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4154	0.4154	1.0000e-005	0.0000	0.4156
Total	**2.0000e-004**	**1.4000e-004**	**1.4700e-003**	**0.0000**	**4.7000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4154**	**0.4154**	**1.0000e-005**	**0.0000**	**0.4156**

3.14 Site Preparation13 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0455	0.4686	0.3977	7.9000e-004		0.0217	0.0217		0.0204	0.0204	0.0000	69.4271	69.4271	0.0180	0.0000	69.8768
Total	**0.0455**	**0.4686**	**0.3977**	**7.9000e-004**	**0.0000**	**0.0217**	**0.0217**	**0.0000**	**0.0204**	**0.0204**	**0.0000**	**69.4271**	**69.4271**	**0.0180**	**0.0000**	**69.8768**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.2300e-003	0.0130	4.0000e-005	4.5800e-003	3.0000e-005	4.6100e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8743	3.8743	9.0000e-005	0.0000	3.8765
Total	**1.7800e-003**	**1.2300e-003**	**0.0130**	**4.0000e-005**	**4.5800e-003**	**3.0000e-005**	**4.6100e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8743**	**3.8743**	**9.0000e-005**	**0.0000**	**3.8765**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0103	0.0750	0.4811	7.9000e-004		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	69.4270	69.4270	0.0180	0.0000	69.8767
Total	**0.0103**	**0.0750**	**0.4811**	**7.9000e-004**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**69.4270**	**69.4270**	**0.0180**	**0.0000**	**69.8767**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.2300e-003	0.0130	4.0000e-005	4.5800e-003	3.0000e-005	4.6100e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8743	3.8743	9.0000e-005	0.0000	3.8765
Total	**1.7800e-003**	**1.2300e-003**	**0.0130**	**4.0000e-005**	**4.5800e-003**	**3.0000e-005**	**4.6100e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8743**	**3.8743**	**9.0000e-005**	**0.0000**	**3.8765**

3.15 Site Preparation14 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0220	0.2308	0.1631	3.6000e-004		0.0103	0.0103		9.7700e-003	9.7700e-003	0.0000	31.2455	31.2455	6.6400e-003	0.0000	31.4116
Total	**0.0220**	**0.2308**	**0.1631**	**3.6000e-004**	**0.0113**	**0.0103**	**0.0216**	**1.2200e-003**	**9.7700e-003**	**0.0110**	**0.0000**	**31.2455**	**31.2455**	**6.6400e-003**	**0.0000**	**31.4116**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2400e-003	8.6000e-004	9.0800e-003	3.0000e-005	3.2000e-003	2.0000e-005	3.2200e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.7054	2.7054	6.0000e-005	0.0000	2.7069
Total	**1.2400e-003**	**8.6000e-004**	**9.0800e-003**	**3.0000e-005**	**3.2000e-003**	**2.0000e-005**	**3.2200e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.7054**	**2.7054**	**6.0000e-005**	**0.0000**	**2.7069**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3100e-003	0.0267	0.1988	3.6000e-004		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	31.2455	31.2455	6.6400e-003	0.0000	31.4115
Total	**4.3100e-003**	**0.0267**	**0.1988**	**3.6000e-004**	**0.0113**	**8.0000e-005**	**0.0114**	**1.2200e-003**	**8.0000e-005**	**1.3000e-003**	**0.0000**	**31.2455**	**31.2455**	**6.6400e-003**	**0.0000**	**31.4115**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2400e-003	8.6000e-004	9.0800e-003	3.0000e-005	3.2000e-003	2.0000e-005	3.2200e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.7054	2.7054	6.0000e-005	0.0000	2.7069
Total	**1.2400e-003**	**8.6000e-004**	**9.0800e-003**	**3.0000e-005**	**3.2000e-003**	**2.0000e-005**	**3.2200e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.7054**	**2.7054**	**6.0000e-005**	**0.0000**	**2.7069**

3.15 Site Preparation14 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0357	0.3649	0.2890	6.5000e-004		0.0159	0.0159		0.0151	0.0151	0.0000	56.2487	56.2487	0.0119	0.0000	56.5456
Total	**0.0357**	**0.3649**	**0.2890**	**6.5000e-004**	**0.0113**	**0.0159**	**0.0272**	**1.2200e-003**	**0.0151**	**0.0164**	**0.0000**	**56.2487**	**56.2487**	**0.0119**	**0.0000**	**56.5456**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.3800e-003	0.0150	5.0000e-005	5.7600e-003	4.0000e-005	5.8000e-003	1.5300e-003	3.0000e-005	1.5700e-003	0.0000	4.6911	4.6911	1.0000e-004	0.0000	4.6936
Total	**2.0900e-003**	**1.3800e-003**	**0.0150**	**5.0000e-005**	**5.7600e-003**	**4.0000e-005**	**5.8000e-003**	**1.5300e-003**	**3.0000e-005**	**1.5700e-003**	**0.0000**	**4.6911**	**4.6911**	**1.0000e-004**	**0.0000**	**4.6936**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7600e-003	0.0480	0.3579	6.5000e-004		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	56.2486	56.2486	0.0119	0.0000	56.5455
Total	**7.7600e-003**	**0.0480**	**0.3579**	**6.5000e-004**	**0.0113**	**1.5000e-004**	**0.0114**	**1.2200e-003**	**1.5000e-004**	**1.3700e-003**	**0.0000**	**56.2486**	**56.2486**	**0.0119**	**0.0000**	**56.5455**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.3800e-003	0.0150	5.0000e-005	5.7600e-003	4.0000e-005	5.8000e-003	1.5300e-003	3.0000e-005	1.5700e-003	0.0000	4.6911	4.6911	1.0000e-004	0.0000	4.6936
Total	**2.0900e-003**	**1.3800e-003**	**0.0150**	**5.0000e-005**	**5.7600e-003**	**4.0000e-005**	**5.8000e-003**	**1.5300e-003**	**3.0000e-005**	**1.5700e-003**	**0.0000**	**4.6911**	**4.6911**	**1.0000e-004**	**0.0000**	**4.6936**

3.16 Site Preparation15 - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0112	0.1121	0.1026	2.0000e-004		5.3500e-003	5.3500e-003		5.0500e-003	5.0500e-003	0.0000	17.0879	17.0879	4.0900e-003	0.0000	17.1902
Total	**0.0112**	**0.1121**	**0.1026**	**2.0000e-004**	**0.0000**	**5.3500e-003**	**5.3500e-003**	**0.0000**	**5.0500e-003**	**5.0500e-003**	**0.0000**	**17.0879**	**17.0879**	**4.0900e-003**	**0.0000**	**17.1902**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.3000e-004	2.4700e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7348	0.7348	2.0000e-005	0.0000	0.7352
Total	**3.4000e-004**	**2.3000e-004**	**2.4700e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7348**	**0.7348**	**2.0000e-005**	**0.0000**	**0.7352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4400e-003	0.0164	0.1219	2.0000e-004		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	17.0879	17.0879	4.0900e-003	0.0000	17.1902
Total	**2.4400e-003**	**0.0164**	**0.1219**	**2.0000e-004**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**17.0879**	**17.0879**	**4.0900e-003**	**0.0000**	**17.1902**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.3000e-004	2.4700e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7348	0.7348	2.0000e-005	0.0000	0.7352
Total	**3.4000e-004**	**2.3000e-004**	**2.4700e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7348**	**0.7348**	**2.0000e-005**	**0.0000**	**0.7352**

3.17 Site Preparation16 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.5700e-003	0.0000	5.5700e-003	6.0000e-004	0.0000	6.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0348	0.3534	0.2858	6.2000e-004		0.0158	0.0158		0.0150	0.0150	0.0000	54.2446	54.2446	0.0110	0.0000	54.5194
Total	**0.0348**	**0.3534**	**0.2858**	**6.2000e-004**	**5.5700e-003**	**0.0158**	**0.0213**	**6.0000e-004**	**0.0150**	**0.0156**	**0.0000**	**54.2446**	**54.2446**	**0.0110**	**0.0000**	**54.5194**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1600e-003	1.4400e-003	0.0156	5.0000e-005	5.9700e-003	4.0000e-005	6.0100e-003	1.5900e-003	4.0000e-005	1.6200e-003	0.0000	4.8649	4.8649	1.0000e-004	0.0000	4.8674
Total	**2.1600e-003**	**1.4400e-003**	**0.0156**	**5.0000e-005**	**5.9700e-003**	**4.0000e-005**	**6.0100e-003**	**1.5900e-003**	**4.0000e-005**	**1.6200e-003**	**0.0000**	**4.8649**	**4.8649**	**1.0000e-004**	**0.0000**	**4.8674**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.5700e-003	0.0000	5.5700e-003	6.0000e-004	0.0000	6.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3600e-003	0.0430	0.3479	6.2000e-004		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	54.2445	54.2445	0.0110	0.0000	54.5194
Total	**7.3600e-003**	**0.0430**	**0.3479**	**6.2000e-004**	**5.5700e-003**	**1.4000e-004**	**5.7100e-003**	**6.0000e-004**	**1.4000e-004**	**7.4000e-004**	**0.0000**	**54.2445**	**54.2445**	**0.0110**	**0.0000**	**54.5194**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1600e-003	1.4400e-003	0.0156	5.0000e-005	5.9700e-003	4.0000e-005	6.0100e-003	1.5900e-003	4.0000e-005	1.6200e-003	0.0000	4.8649	4.8649	1.0000e-004	0.0000	4.8674
Total	**2.1600e-003**	**1.4400e-003**	**0.0156**	**5.0000e-005**	**5.9700e-003**	**4.0000e-005**	**6.0100e-003**	**1.5900e-003**	**4.0000e-005**	**1.6200e-003**	**0.0000**	**4.8649**	**4.8649**	**1.0000e-004**	**0.0000**	**4.8674**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.580272	0.038274	0.193741	0.109917	0.015100	0.005324	0.018491	0.026678	0.002649	0.002134	0.005793	0.000896	0.000732

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003
Unmitigated	9.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003
Total	**8.0000e-005**	**1.0000e-005**	**9.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.7900e-003**	**1.7900e-003**	**0.0000**	**0.0000**	**1.9000e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.7900e-003	1.7900e-003	0.0000	0.0000	1.9000e-003
Total	**8.0000e-005**	**1.0000e-005**	**9.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.7900e-003**	**1.7900e-003**	**0.0000**	**0.0000**	**1.9000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix 3.10
Greenhouse Gas Emissions

3.10A. Regulatory Framework
3.10B. Impact Summary by Service Area

APPENDIX 3.10A
Regulatory Framework

3.10.2 Regulatory Framework

Federal

Clean Air Act

On April 2, 2007, in *Massachusetts v. USEPA* (549 US 497), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the USEPA must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making such decisions, the USEPA is required to follow the language of Section 202(a) of the Clean Air Act, which obligates it to prescribe (and from time to time revise) standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines. The Supreme Court decision resulted from a petition for rulemaking under Section 202(a) filed by more than a dozen environmental, renewable energy and other organizations.

On April 17, 2009, the USEPA Administrator signed proposed "endangerment" and "cause or contribute" findings for GHGs under Section 202(a) of the Clean Air Act. The USEPA found that six GHGs, taken in combination, endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under Clean Air Act Section 202(a). Pursuant to 40 CFR Part 52*, Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, USEPA has mandated that Prevention of Significant Deterioration (PSD) and Title V requirements apply to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2017b). The proposed actions under the Program would not trigger PSD or Title V permitting under this regulation because they would generate substantially less than 100,000 tons of CO_2e emissions per year.

U.S. Supreme Court Decision in Utility Air Regulatory Group v. USEPA

On June 23, 2014, the U.S. Supreme Court held that USEPA may not treat GHG emissions as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT). In accordance with the Supreme Court decision, on April 10, 2015, the D.C. Circuit issued an amended judgment in *Coalition for Responsible Regulation, Inc. v. U.S. Environmental Protection Agency*, which vacated the PSD and Title V regulations under review in that case to the extent that they require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit GHGs above the applicable major source thresholds. The D.C. Circuit also directed USEPA to consider whether any further revisions to its regulations are appropriate, and if so, to undertake to make such revisions. In response to the Supreme Court decision and the D.C. Circuit's amended judgment, the USEPA intends to conduct future rulemaking action to make appropriate revisions to the PSD and operating permit rules (USEPA, 2017b).

State Regulations

A variety of statewide rules and regulations mandate the quantification and, if emissions exceed established thresholds, the reduction of GHGs. CEQA requires lead agencies to evaluate project-related GHG emissions and the potential for projects to contribute to climate change and to provide appropriate mitigation in cases where the lead agency determines that a project would result in a significant addition of GHGs to the atmosphere.

Executive Order S-3-05

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006, and establishes statewide emission reduction targets through the year 2050 as follows:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

This executive order does not include any specific requirements that pertain to the Program; however, future actions taken by the state to implement these goals may affect the Program, depending on the specific implementation measures that are developed.

Assembly Bill 32

California Assembly Bill (AB) 32,[1] the Global Warming Solutions Act of 2006, is the cornerstone of state efforts to reduce GHG emissions. As described below, the law requires CARB to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels, develop a mandatory reporting program of GHG emissions, adopt regulations for discrete early actions to reduce GHG emissions, prepare a scoping plan to identify how emissions reductions will be achieved, and adopt a regulation that establishes a market-based compliance mechanism (also referred to as "Cap and Trade").

Statewide GHG Emissions Cap

In 2007, CARB established the statewide GHG emissions limit that must be achieved by 2020, equivalent to the statewide GHG emissions levels in 1990, at 427 million metric tons of CO_2e. This figure is approximately 30 percent below projected "business-as-usual" emissions of 596 million metric tons of CO_2e for 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2009).

Climate Change Scoping Plan

In December 2008, CARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit (CARB, 2009). The Scoping Plan estimated a reduction of 174 million metric tons CO_2e from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors, and proposed a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan must be updated every 5 years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. CARB released the First Update to the Climate Change Scoping Plan in May 2014 (CARB, 2014). The Update builds upon the initial Scoping Plan with new strategies and recommendations. The Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon

[1] AB 32 is codified in California Health and Safety Code Division 25.5, Sections 38500 et seq.

investments. The Update defines CARB's climate change priorities for the next 5 years and sets the groundwork to reach California's long-term climate goals set forth in Executive Orders S-3-05 and B-16-2012 (the latter of these ordered State agencies to facilitate the rapid commercialization of zero-emission vehicles (ZEVs), setting a target for the number of them on California roads and also set a goal for reduction of emissions from the transportation sector). The Update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 (see below).

Senate Bill 97

In 2007, the California State Legislature passed Senate Bill (SB) 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The amendments took effect March 18, 2010. The amendments add Section 15064.4 to the CEQA Guidelines, specifically addressing the potential significance of GHG emissions. Section 15064.4 neither requires nor recommends a specific analytical methodology or quantitative criteria for determining the significance of GHG emissions. Rather, the section calls for a "good faith effort" to "describe, calculate or estimate" GHG emissions and indicates that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would:

1. Increase or reduce GHG emissions;
2. Exceed a locally applicable threshold of significance; or
3. Comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

The CEQA Guidelines also state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064(h)(3)).

Executive Order B-30-15

In April 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. Reaching this emission reduction target will make it possible for California to reach its ultimate goal of reducing emissions 80 percent under 1990 levels by 2050, as identified in Executive Order S-3-05. In 2016, the Legislature passed SB 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. Executive Order B-30-15 also specifically addresses the need for climate adaptation and directs state government to:

1. Incorporate climate change impacts into the State's 5-Year Infrastructure Plan;
2. Update the Safeguarding California Plan, the state climate adaption strategy to identify how climate change will affect California infrastructure and industry and what actions the state can take to reduce the risks posed by climate change;
3. Factor climate change into state agencies' planning and investment decisions; and
4. Implement measures under existing agency and departmental authority to reduce GHG emissions (Office of the Governor, 2015).

Executive Order B-30-15 requires CARB to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target. The 2030 Draft Scoping Plan will serve as the framework to define the State's climate change priorities for the next 15 years and beyond. In June 2016, CARB released the 2030 Target Scoping Plan

Update Concept Paper to describe potential policy concepts to achieve the 2030 target that can be incorporated in the 2030 Draft Scoping Plan. The concept paper presents four potential high-level concepts for achieving the needed GHG reductions (CARB, 2016b). The Program would not conflict with Executive Order B-30-15's GHG emissions goal because it would generate direct and indirect emissions of GHG emissions that could have a less-than-significant impact on the environment. This issue is addressed in Section 3.10.3.2.

Local

Marin Countywide Plan

Policies regarding greenhouse gas emissions are contained within the Natural Systems and Agricultural Element of the Marin Countywide Plan. Goals that may be applicable to the Program include the following (Marin County, 2007):

> **Goal AIR-4: Minimization of Contributions to Greenhouse Gases.** Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.

Marin County Climate Action Plan

The *Marin County Climate Action Plan 2015 Update* (Marin County, 2015) builds on the County's 2006 GHG Reduction Plan and provides an update of GHG emissions in 2012, forecasts of emissions for 2020, and an assessment of actions that the County will take to further reduce emissions by 2020. The update includes two targets:

1. **2020 Community Emissions Reduction Target** - Reduce GHG emissions from community activities in the unincorporated areas of Marin County by at least 30 percent below 1990 levels by 2020; and
2. **2020 Municipal Emissions Reduction Target** - Reduce GHG emissions from the County's municipal activities by at least 15 percent below 1990 levels by 2020.

The update includes a variety of regulatory and incentive-based strategies that aim to reduce GHG emissions from both existing and new development in the County, supplement State programs, and achieve additional emissions reductions. There are 13 local community actions and 8 local municipal actions included in the update. Although, none of these measures would apply to the activities associated with the implementation of the Program, the GHG emissions inventory for the Climate Action Plan included forecasted emissions for off-road construction equipment (based on the OFFROAD model); therefore. Program-related construction emissions that would occur in unincorporated Marin County would be covered by and subject to the Climate Action Plan.

Marin Climate and Energy Partnership

The Marin Climate and Energy Partnership (MCEP) was initiated in 2007 recognizing the need for a partnership platform that would allow collaboration between jurisdictions in Marin County on the complex GHG reduction challenge. The MCEP's goal was to bring together representatives of all 11 Marin jurisdictions, the County, MMWD, and Transportation Authority of Marin, to develop the MCEP structure and goals and to develop the necessary resources to plan and implement coordinated GHG Reduction strategies among all local governments in Marin County, along with the transportation and water agencies.

One mission of the MCEP is to reduce GHG emission levels to the targets of Marin County and local municipalities in compliance with the standards set by AB 32, while also meeting the criteria air pollutant reduction goals of the BAAQMD. MCEP is directed by a Steering Committee consisting of one representative from each partner jurisdiction and agency, working in collaboration with relevant staff liaisons from member

entities to implement a coordinated approach to local and regional emissions reduction targets and climate action planning goals.

City of San Rafael Climate Change Action Plan

The City of San Rafael Climate Change Action Plan targets a total reduction of 25 percent by 2020, to be achieved as actions at other levels of government, technological improvements, and local educational efforts to spur residents and businesses to reduce their carbon footprints (City of San Rafael, 2009). The recommended programs identified in the plan are not directly applicable to the proposed Program.

City of Novato Climate Change Action Plan

The City of Novato adopted in Novato Climate Change Action Plan in 2009 (City of Novato, 2009). The plan outlines strategies to achieve a GHG reduction target of 15 percent below 2005 emission levels by the year 2020, consistent with the State's direction to local governments. The plan also suggests a 2035 goal of 40 percent below 2005 levels to achieve the 80 percent statewide reduction by 2050 called for in Executive Order S-3-05. The Climate Action Plan includes these elements (City of Novato, 2015):

1. A community-wide greenhouse gas emissions inventory and a "business-as-usual" forecast of future emissions.
2. A greenhouse gas reduction target consistent with AB 32.
3. Local and state policies and actions that may impact greenhouse gas emissions within the city or town
4. Quantification of greenhouse gas reduction measures demonstrating that, if fully implemented, the greenhouse gas reduction target will be met.
5. Water Conservation. Reduce emissions from water and wastewater sources by increasing water conservation
6. Municipal Water Conservation. Reduce municipal water use 20% by 2020 and 30% by 2035

Napa County Climate Action Plan

The Napa County Climate Action Plan describes GHG emissions from 2005 and forecasted emissions for 2020, and identifies the feasible measure that Napa County intends to implement to reduce emissions by 2020 to a level 15 percent below the 2005 levels. By seeking to reduce emissions to 15 percent below 2005 levels by 2020, the Plan addresses the commitment in the Napa County General Plan that is similar to the state goals in Assembly Bill (AB) 32. The revised plan provides an approach to reducing GHG emissions that can be used for tiering CEQA review pursuant to state and BAAQMD CEQA Guidelines (Napa County, 2012).

The revised Plan contains:

1. an inventory of GHG emissions in the unincorporated portions of Napa County in 2005
2. an inventory of projected GHG emissions in 2020
3. a list of actions that the County will take to reduce GHG emissions by 2020

City of American Canyon Energy Efficiency Climate Action Plan

The American Canyon Energy Efficiency Climate Action Plan will enable the City to lead the community with innovative programs for energy efficiency, sustainability, and climate change. The plan was designated to support (City of American Canyon, 2012):

> **General Plan Goal 8F:** Reduce consumption of nonrenewable energy sources and support the development and utilization of new energy sources.

The plan proposes feasible strategies and measures that cost-effectively reduce energy use and energy-related GHG emissions in both municipal operations and across the community.

City of Petaluma

The Natural Environment Chapter in the City of Petaluma's General Plan contains goals and policies to help improve air quality. The following goal may be applicable to the Program (City of Petaluma, 2008).

> **Goal 4-G-6: Greenhouse Gas Emissions:** Reduce the contribution to greenhouse gases from existing sources and minimize the contribution of greenhouse gases from new construction and sources.

Sonoma County Climate Action Plan

Sonoma County's climate action plan was blocked in a court ruling July 20, 2017. The environmental document supported Sonoma County's plan for reducing greenhouse gases, but was rejected due to its inadequate account for emissions generated outside the county, in part by the wine and tourism industries (The Press Democrat, 2017). Therefore, while the plan does not carry the force of law, it is being utilized as an advisory document until such time an enforceable plan is adopted.

APPENDIX 3.10B
Impact Summary by Service Area

This table provides a summary of NBWRP Phase 2 Program impacts related to GHG emissions.

POTENTIAL IMPACTS AND SIGNIFICANCE – GHG EMISSIONS

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.10.1: Incremental contribution to climate change from GHG emissions associated with NBWRP Phase 2.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.10.2: Conflict with Executive Order B-30-15 or Executive Order S-3-05 Emissions Reduction Goals.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
NAE = No Adverse Effect
LS = Less than Significant impact, no mitigation required

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.11
Noise

3.11A. Setting, Regulatory Framework, and Direct and Indirect Effects
3.11B. Impact Summary by Service Area

APPENDIX 3.11A

Setting, Regulatory Framework, and Direct and Indirect Effects

3.11.1 Affected Environment

Regional Noise Environment and Sensitive Receptors

Novato SD

Regional Noise Environment. Projects within the jurisdiction of the Novato SD would include the (1) capacity expansion of the Novato SD RWF, (2) installation of 1.1-mile of pipeline and (3) the turnout to transition wetlands. The locations of these activities are illustrated in Figure 2-3 in Appendix A. As shown in Figure 2-3, predominant noise sources within this portion of the Program area consists of vehicular traffic along Highway 101 and arterial roadways such as Franklin Avenue and Davidson Street, and primarily commuter rail traffic along the Northwest Pacific Railroad. Sensitive land uses in the vicinity of this portion of the Program area are currently exposed to traffic noise levels ranging from 55 to 75 dBA L_{dn} (City of Novato, 2016). Noise levels are substantially lower at locations that are shielded from freeway noise by hills than at locations that have a direct line of sight to the freeway. Aircraft operations at Gnoss Field also contribute to the regional noise environment. Other noise sources in the city include emergency medical vehicles, public transit vehicles, power tools, and machinery.

Sensitive Receptors. Sensitive receptors located in the Novato SD service area that may be impacted by the NBWRP include the following:

1. ***Hospitals/Nursing Homes.*** The closest health care facility to a Program project in the Novato service area is the Novato Community (Sutter Health) Hospital located approximately 210 feet northwest of the pipeline alignment that would be installed along Rowland Way.

2. ***Residential.*** Residential development in the project area includes multiple neighborhoods throughout the City of Novato. The proposed pipelines would cross through existing residential neighborhoods along Franklin Avenue and Davidson Street. Of these residential neighborhoods, residences could be as close as 25 feet from the construction areas.

SVCSD

Regional Noise Environment. Projects within the jurisdiction of the SVCSD will include the installation of a 2.2-mile pipeline along Napa Road between 5th Street East and east of Nicholas Road. The locations of these construction activities are illustrated in Figure 2-4 in Appendix A. As shown in Figure 2-4, predominant noise sources within the project area consist of vehicular traffic along local arterial roadways such as Napa Road, 5th Street and 8th Street. In addition to local traffic, the project area is located within 1-mile of the Sonoma Skypark airport. The predominant surrounding land use type in this area can be categorized as normal suburban residential. Typical noise levels with a normal suburban residential soundscape can range from 53 to 57 dBA L_{dn} (USEPA, 1974).

Sensitive Receptors. Sensitive receptors located within the SVCSD service area that may be impacted by the NBWRP include scattered single-family residences along Napa Road. Residences could be as close as 50 feet from construction areas.

MMWD

Regional Noise Environment. The expansion of the recycled water distribution system to the San Quentin Prison would occur within the jurisdiction of the MMWD. The locations of the associated facilities are illustrated in Figure 2-5 in Appendix A. As shown in Figure 2-5, predominant noise sources within this region of the Program area consist of vehicular traffic along Interstate 580 (I-580) and Sir Francis Drake Boulevard. The area surrounding the project area can be categorized as urban residential. Typical noise levels with an urban residential soundscape can range from 58 to 62 dBA L_{dn} (USEPA, 1974).

Sensitive Receptors. Sensitive receptors located within the MMWD service area that may be impacted by the NBWRP consist of staff living quarters on the San Quentin State Prison grounds approximately 900 feet from the Central Marin Sanitation Agency (CSMA) plant and approximately 100 feet south of Sir Francis Drake Boulevard. The crest of the hill forming San Quentin Point separates the CMSA facility from the living quarters and inmate housing on the prison grounds. The closest buildings to the proposed pipeline connecting the plant to San Quentin Prison consist of single-family buildings and inmate housing building at the San Quentin Prison. The single-family buildings and inmate housing buildings at San Quentin Prison are located approximately 100 feet and 150 feet from the proposed pipeline, respectively.

Napa SD

Regional Noise Environment. Projects within the jurisdiction of the Napa SD would include the Soscol Water Recycling Facility (WRF) Increased Filter Capacity and the Additional Soscol WRF Covered Storage. Predominant noise sources within these project areas primarily consist of vehicular traffic along Highway 29 and other local roadways. The area surrounding these project areas can be categorized as suburban residential. Typical noise levels within a suburban residential neighborhood can range from 48 to 52 dBA L_{dn} (USEPA, 1974).

Sensitive Receptors. There are no noise sensitive receptors located within 1,000 feet of the Napa SD WTP.

Petaluma

Regional Noise Environment. Projects within the jurisdiction of the City of Petaluma will include (1) increase capacity of the Ellis Creek WRF, (2) expansion of the urban recycled water system, (3) expansion of the agricultural recycled water system. The locations of these activities are illustrated in Figure 2-7. As shown in Figure 2-7 in Appendix A, predominant noise sources within the project area consist of vehicular traffic along Lakeville Highway. The area surrounding the project area consists of scattered residential homes and agricultural uses, which can be categorized as a quiet suburban residential area. Typical noise levels within a suburban residential neighborhood can range from 48 to 52 dBA L_{dn} (USEPA, 1974).

Sensitive Receptors. Sensitive receptors located within the City of Petaluma service area that may be impacted by the NBWRP consist of single-family residences located approximately 230 feet northeast of the Ellis Creek WRF and approximately 30 feet from where the proposed pipelines would be installed.

American Canyon

Regional Noise Environment. Program projects within the jurisdiction of the City of American Canyon include the Phase 1 and 2 Recycled Water Distribution System Expansions and upgrades to the WRF treatment plant. The locations of these facilities are illustrated in Figure 2-8 in Appendix A. As shown in Figure 2-8, predominant noise sources within the project area consist of vehicular traffic along Highway 29 and local arterial roadways such as Donaldson Way and American Canyon Road. According to the City of American Canyon General Plan EIR, the average noise levels along primary roadway segments range from approximately 65 to 69 dBA L_{dn} 50 feet from the centerline of roadway (City of American Canyon, 1994a). In addition to vehicular traffic, the project area is a located within a mile and half of Napa County Airport. The project area is not located within Napa County Airport's 55 dBA L_{dn} noise contour (City of American Canyon, 1994b).

Sensitive Receptors. Sensitive receptors located within the City of American Canyon service area that may be impacted by the NBWRP consist of single-family residences, some of which would be located within 30 feet of where the proposed pipeline would be installed along local roadways. There are no sensitive land uses within 1,000 feet of the WRF treatment plant.

3.11.2 Regulatory Framework

Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters (approximately 50 feet) from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

State

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the federal limit of 80 dBA. The State pass-by standard for light trucks and passenger cars (less than 4.8 tons, gross vehicle rating) is also 80 dBA at 15 meters (approx. 50 feet) from the roadway centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

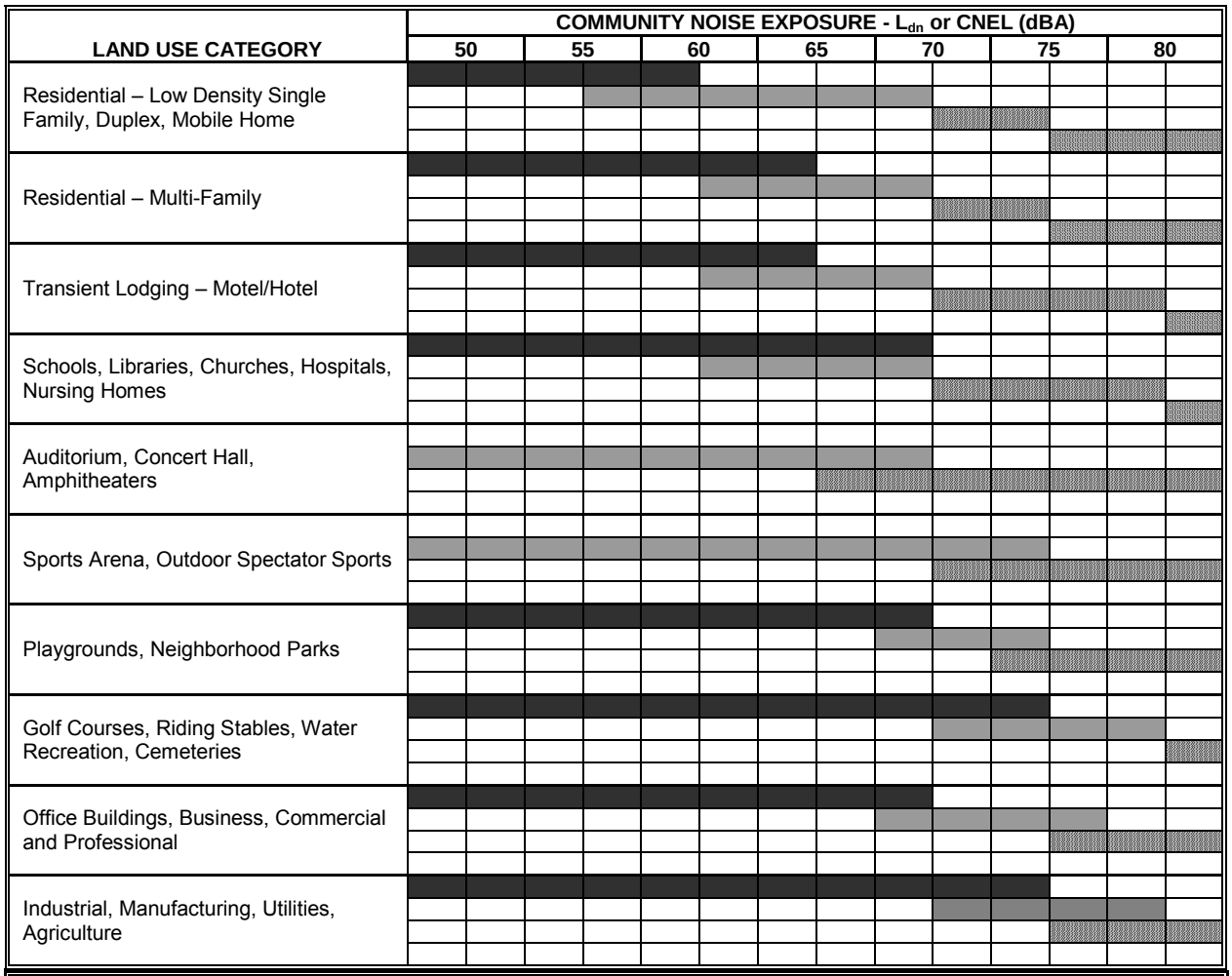
Local

Marin County

A policy and associated implementing programs included in the Marin Countywide Plan that may be applicable to the proposed project include the following (Marin County, 2007):

> ***Policy NO-1.3. Regulate Noise Generating Activities.*** Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.
>
> ***Implementing Program NO-1.a. Enforce Allowable Noise Levels.*** Through CEQA and County discretionary review, require new development to comply with allowable noise levels.
>
> The Acceptable Noise Levels in Figure 3-41 [shown as **Figure A3.11-1** below] shall be used as a guide for determining the appropriate type of new development in relation to its ambient noise environment. Figure 3-41 [shown as Figure A3.11-1 below] applies primarily to proposed development exposed to transportation generated noise and to existing development exposed to increases in transportation generated noise due to proposed development. The standards in Figure 3-41 [shown as Figure A3.11-1 below] shall also be used to determine allowable noise levels for commercial, industrial, agricultural, or other less-noise-sensitive land uses exposed to stationery source noise generated by new development.
>
> The Benchmarks for Allowable Noise Exposure from stationary noise sources in **Table A3.11-1** shall be used as a guide for establishing allowable noise levels produced by stationary noise sources. The standards apply to new stationary noise-generating development proposed near existing residential or other noise-sensitive land uses.
>
> *Implementing Program NO-1.i. Regulate Noise Sources.* Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement provisions of the plan.

FIGURE A3.11-1: LAND USE COMPATIBILITY STANDARDS



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: Marin County, 2008.

TABLE A3.11-1: MARIN COUNTY BENCHMARKS FOR ALLOWABLE NOISE EXPOSURE FROM STATIONARY NOISE SOURCES

Category	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq}, dBA	50	45
Maximum Level, dBA	70	65
Maximum Level, dBA (Impulsive Noise)	65	60

Guidelines for use of Table A3.11-1:

1. The measurements are made at the property line of the receiving land use. The effectiveness of noise mitigation measures should be determined by applying the standards on the receptor side of noise barriers or other property line noise mitigation measures.
2. The nighttime standards apply only when the receiving land use operates or is occupied during nighttime hours.
3. Sound-level measurements to determine maximum level noise shall be made with “slow” meter response.
4. Sound-level measurements for impulsive noise sources shall be made with "fast" meter response. Impulsive noises are defined as those that have sharp, loud peaks in decibel levels but that quickly disappear. Examples include a dog’s bark, a hammer’s bang, and noise with speech or music content.
5. The allowable noise level standard shall be raised to the ambient noise level in areas where the ambient level already exceeds the standards shown in this table. For example, if the neighborhood already experiences daytime hourly noise levels of 60 dBA as an ambient condition, the noise level standard shall be raised to 60 dBA.
6. The allowable noise level shall be reduced 5 dB if the ambient hourly L_{eq} is at least 10 dB lower than the noise-level standard shown in this table. For example, if the neighborhood experiences daytime hourly noise levels of 40 dBA as an ambient condition, the noise level standard shall be lowered to 45 dBA.

SOURCE: Marin County, 2007.

Chapter 6.70 of the Marin County code limits the hours during which construction activities are permitted to between the hours of 7:00 a.m. and 6:00 p.m. on Monday through Friday and between 9:00 a.m. and 5:00 p.m. on Saturdays. Construction activities are strictly prohibited on Sundays and holidays. The code also states that loud noise-generating construction-related equipment such as backhoes, generators, and jackhammers, can be maintained, operated, or serviced at a construction site for permits administered by the community development agency from 8:00 a.m. to 5:00 p.m. on Monday through Friday only. Special exemptions may occur for construction projects of the city, County, State, other public agency, or other public utility (Marin County, 2017).

Sonoma County

Goal NE-1 of the Sonoma County General Plan 2020 Noise Element is to “protect people from the harmful effects of exposure to excessive noise and to achieve an environment in which people and land uses may function without impairment from noise” (Sonoma County, 2012). This goal aims to protect persons from existing or future excessive levels of noise that interfere with sleep, communication, relaxation, health, or legally permitted use of property. To achieve this goal, the Noise Element contains the following policies that may be applicable to the Program:

> ***Policy NE-1a*:** Designate areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dBA L_{dn}, 60 dBA CNEL, or the performance standards of Table NE-2 [shown as **Table A3.11-2** below] of the Noise Element.

TABLE A3.11-2: SONOMA COUNTY MAXIMUM ALLOWABLE EXTERIOR NOISE EXPOSURES FOR NON-TRANSPORTATION NOISE SOURCES

Hourly Noise Metric, dBA	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L_{50} (30 minutes in any hour)	50	45
L_{25} (15 minutes in an hour)	55	50
L_{08} (4 minutes in 48 seconds in any hour)	60	55
L_{02} (72 seconds in any hour)	65	60

SOURCE: County of Sonoma, 2008.

***Policy NE-1c*:** Control non-transportation related noise from new projects such that the total noise level resulting from new sources and ambient noise shall not exceed the standards in Table NE-2 (shown as Table A3.11-2 above). Limit exceptions to the following:

1. If the ambient noise level exceeds the standard in Table NE-2 (shown as Table A3.11-2 above), adjust the standard to equal the ambient level, up to a maximum of 5 dB above the standard, provided that no measurable increase (i.e., +/- 1.5 dB) shall be allowed.
2. Reduce the applicable standards in Table NE-2 (shown as Table A3.11-2 above) by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels.
3. Reduce the applicable standards in Table NE-2 (shown as Table A3.11-2 above) by 5 dB if the proposed use exceeds the ambient level by 10 dB or more.
4. For short-term noise sources which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE-2 (shown as Table A3.11-2 above) may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area
5. Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
    a. the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
    b. there is available open land on those noise sensitive lands for noise attenuation.

***Policy NE-1f*.** Require development projects which do not include or affect residential uses or other noise sensitive uses to include noise mitigation measures where necessary to maintain noise levels compatible with activities planned for the proposed project site and vicinity.

The County of Sonoma General Plan 2020 Noise Element does not specifically address intermittent or short-term construction noises and there is currently no adopted noise ordinance under the Sonoma County Code.

Napa County

The Napa County General Plan contains the following policies relevant to the project (Napa County, 2008):

Policy CC-35: The noises associated with agriculture, including agricultural processing, are considered an acceptable and necessary part of the community character of Napa County, and are not considered to be undesirable provided that normal and reasonable measures are taken to avoid significantly impacting adjacent uses.

Policy CC-38: The following are the County's standards for maximum exterior noise levels for various types of land uses established in the County's Noise Ordinance [shown below as **Table A3.11-3**]. Additional standards are provided in the Noise Ordinance for construction activities (i.e., intermittent or temporary noise).

a) For the purposes of implementing this policy, standards for residential uses shall be measured at the housing unit in areas subject to noise levels in excess of the desired levels shown above.

b) Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction at the industrial use.

c) Where projected noise levels for a given location are not included in this Element, site-specific noise modeling may need to be conducted in order to apply the County's Noise policies.

d) For further information, see the County Noise Ordinance.

TABLE 3.A11-3: NAPA COUNTY EXTERIOR NOISE LEVEL STANDARDS (LEVELS NOT TO BE EXCEEDED MORE THAN 30 MINUTES IN ANY HOUR)

Land Use Type	Time Period	Noise Level (dBA) by Noise Zone Classification		
		Rural	Suburban	Urban
Single-Family Homes and Duplexes	10:00 p.m. to 7:00 a.m.	45	45	50
	7:00 a.m. to 10:00 p.m.	50	55	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10:00 p.m. to 7:00 a.m.	45	50	55
	7:00 a.m. to 10:00 p.m.	50	55	60
Office and Retail	10:00 p.m. to 7:00 a.m.	60		
	7:00 a.m. to 10:00 p.m.	65		
Industrial and wineries	Anytime	75		

SOURCE: Napa County, 2008.

Policy CC-49: Consistent with the County's Noise Ordinance, ensure that reasonable measures are taken such that temporary and intermittent noise associated with construction and other activities does not become intolerable to those in the area. Construction hours shall be limited per the requirements of the Noise Ordinance. Maximum acceptable noise limits at the sensitive receptor are defined in Policies CC-35, CC-36, and CC-37.

According to Chapter 8.08.025 of the Napa County code, any person engaged in construction activity, other than construction activity on an existing residential unit which such person owns or rents, pursuant to any provision of this code, shall limit said construction activity as follows:

A. Construction activities throughout the entire duration of the project shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. There will be no start-up of machines nor equipment prior to 8:00 a.m., Monday through Friday; no delivery of materials nor equipment prior to 7:30 a.m. nor past 5:00 p.m., Monday through Friday; no cleaning of machines nor equipment past 6:00 p.m., Monday through Friday; no servicing of equipment past 6:45 p.m., Monday through Friday; and construction on weekends or legal holidays shall be limited to the hours of 8:00 a.m. to 4:00 p.m., unless a permit shall first have been secured from the City Manager, or designee, pursuant to Section 8.08.050 of this code. The City Manager, or designee, shall grant such permit:

    1. For emergency work;
    2. Other work, if work and equipment will not create noise that may be unreasonably offensive to neighbors as to constitute a nuisance; or
    3. If necessary to protect the public health, safety, and welfare.

B. All muffler systems on construction equipment shall be properly maintained.

C. All construction equipment shall not be placed adjacent to developed areas unless said equipment is provided with acoustical shielding.

D. All construction and grading equipment shall be shut down when not actively in use.

E. Construction activity by or on behalf of a public agency, which is necessary to avoid a disruption of a public project or to protect the public health, safety, and welfare, shall be exempt from the time limitations of this section.

F. As a separate, distinct, and cumulative remedy established for a violation of this section, the Police and/or the Code Enforcement Officer may issue a stop work order for violation of this section. Such order shall

become effective immediately upon posting of the notice. After service of the stop work order, no person shall perform any act with respect to the subject property in violation of any of the terms of the stop work order, except such actions the city determines are reasonably necessary to render the subject property safe and/or secure until the violation has been corrected (Napa County, 2008).

City of Novato

The Noise Element of the City of Novato General Plan identifies noise/land use compatibility guidelines for development in the City and contains policies addressing community noise issues. The General Plan has identified acceptable noise levels for residential uses with a maximum conditionally acceptable exterior noise level of 60 dBA, and an interior noise standard of 45 dBA. Additionally, the following General Plan objectives may apply to the Program (City of Novato, 1996):

***Objective 11*:** Ensure compatibility of new development with existing and future noise levels.

***Objective 12*:** Prevent land uses which increase the noise level above acceptable standards or require mitigation to reduce noise to acceptable levels.

Chapter 19.22 of the City of Novato Municipal Code sets forth noise restrictions for sources located within the City. **Table A3.11-4** presents allowable exterior noise levels as set forth in the Municipal Code.

TABLE A3.11-4: CITY OF NOVATO ALLOWABLE EXTERIOR NOISE LEVELS

Type of Land Use	Allowable Exterior Levels[a]	
	Time Interval	Maximum Noise Level[b]
Residential	10:00 p.m. to 6:00 a.m.	45 dBA
	6:00 a.m. to 10:00 p.m.	60 dBA
Commercial	10:00 p.m. to 6:00 a.m.	60 dBA
	6:00 a.m. to 10:00 p.m.	70 dBA
Industrial or Manufacturing	Anytime	70 dBA

NOTES:
[a] Each of these noise limits shall be reduced by 5 dB for impulse or simple tone noises. If ambient noise exceeds the resulting standard, the ambient shall be the standard.
[b] Maximum noise levels shall not be exceeded for an aggregate period of more than 3 minutes within 1-hour time period or by more than 20 dBA at any time.

SOURCE: City of Novato, 2017.

Authorized construction activities are exempt from noise level standards set forth in Table 3.11-4; however, these activities are limited to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 10:00 a.m. and 5:00 p.m. on Saturdays. Construction activities are not permitted on Sundays or on official federal holidays. Authorized grading activities and equipment operations are only permitted between 7:00 a.m. and 6:00 p.m. on weekdays when City inspectors are available to monitor activities (City of Novato, 2017).

In addition to noise restrictions, the Municipal Code also states that activities shall not generate ground vibration that is perceptible without instruments by the average person at any point along or beyond the property line of the parcel containing the activities. Temporary vibration from construction, demolition, and vehicles associated with construction are exempt (City of Novato, 2017).

City of American Canyon

Chapter 11 "Noise Element" of the City of American Canyon General Plan establishes the following applicable policies related to noise and vibration:

***Policy 11.7.1*:** Limit non-emergency construction activities adjacent to existing noise-sensitive uses to daylight hours between 6:30 a.m. and 8:00 p.m.

***Policy 11.7.2*:** Require construction activities to employ practical techniques and practices that minimize the generation of adverse and/or excessive noise impacts on adjacent land uses.

The following sections of the City of American Canyon Municipal Code are relevant to the Program:

8.12.060 Interior noise limits

Maximum Permissible Dwelling Interior Sound Levels. The interior noise standards for residential dwelling units generated by noise sources outside the dwelling unit, as presented in **Table A3.11-5** shall apply, unless otherwise specifically indicated, within all such dwelling units.

TABLE A3.11-5: MAXIMUM ALLOWED INTERIOR NOISE LIMITS CITY OF AMERICAN CANYON

Type of Land Use	Time Interval	Allowable Interior Noise Level (dBA L_{eq})
Residential	10:00 p.m. - 7:00 a.m.	55
	7:00 a.m. - 10:00 p.m.	60

SOURCE: City of American Canyon, 2017.

8.12.070 Exterior noise limits

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards shown in **Table A3.11-6**.

TABLE A3.11-6: CITY OF AMERICAN CANYON MAXIMUM ALLOWED EXTERIOR NOISE LIMITS

Type of Land Use	Time Interval	Allowable Exterior Noise Level (dBA L_{eq})
Residential Single and double	10:00 p.m. - 7:00 a.m.	50
	7:00 a.m. - 10:00 p.m.	60
Residential multiple	10:00 p.m. - 7:00 a.m.	55
	7:00 a.m. - 10:00 p.m.	60

SOURCE: City of American Canyon, 2017.

8.12.080 Specific Types of Noise Prohibited

(B)(2)(a). Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of 7:00 p.m. and 7:00 a.m., such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the appropriate authority. This subsection shall not apply to the use of domestic power tools, as specified in subsection (B)(3) of this section.

(B)(2)(b). Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in **Table A3.11-7**.

TABLE A3.11-7: CITY OF AMERICAN CANYON MAXIMUM ALLOWED EXTERIOR NOISE LIMITS

Time Interval	Land use		
	Residential	Commercial	Industrial
7:00 a.m. - 7:00 p.m.	75 dBA L_{max}	80 dBA L_{max}	85 dBA L_{max}
7:00 p.m. - 7:00 a.m.	60 dBA L_{max}	65 dBA L_{max}	70 dBA L_{max}

SOURCE: City of American Canyon, 2017

City of Petaluma

The City of Petaluma General Plan 2025 contains the following policies relevant to the Program (City of Petaluma, 2012):

***Policy 10-P-3*:** Protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by minimizing the increase of noise levels in the future.

A. Continue efforts to incorporate noise considerations into land use planning decisions, and guide the location and design of transportation facilities to minimize the effects of noise on adjacent land uses.

B. Discourage location of new noise-sensitive uses, primarily homes, in areas with projected noise levels greater than 65 dB CNEL. Where such uses are permitted, require incorporation of mitigation measures to ensure that interior noise levels do not exceed 45 dB CNEL.

C. Ensure that the City's Noise Ordinance and other regulations:

   i. Require that applicants for new noise-sensitive development in areas subject to noise levels greater than 65 dBA CNEL obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures.

   ii. Require placement of fixed equipment, such as air conditioning units and condensers, inside or in the walls of new buildings or on roof-tops of central units in order to reduce noise impacts on any nearby sensitive receptors.

   iii. Establish appropriate noise-emission standards to be used in connection with the purchase, use, and maintenance of City vehicles.

D. Continue to require control of noise or mitigation measures for any noise-emitting construction equipment or activity.

G. In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four or more dB to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in Figure 10-2: Land Use Compatibility Standards.

The City's Noise Ordinance establishes the following controls on construction-related noise. The City of Petaluma's Implementing Zoning Ordinance (IZO) Chapter 21.040(A)(3)(a) limits noise generating construction activities to the hours of 7:00 a.m. to 10:00 p.m. on weekdays and 9:00 a.m. to 10:00 p.m. on weekends and holidays. For daily operational noise, IZO provides guidelines and standards for acceptable levels. IZO Chapter 21.040(4)(A) establishes an hourly average level of 60 dBA as the maximum that may be generated on one land use that would be affecting another land use. Allowable levels are adjusted to account

for existing ambient noise levels though the maximum allowed noise level may not exceed 75 dBA after adjustments are made.

City of Sonoma

The Noise Element of the City of Sonoma 2020 General Plan contains the following policies and implementation measure that may be applicable to the Program (City of Sonoma, 2006):

***Policy 1.1*:** Apply the following standards for maximum L_{dn} levels to citywide development:

45 L_{dn}: For indoor environments in all residential units.

60 L_{dn}: For outdoor environments around all residential developments and outdoor public facilities (e.g., parks)

65 L_{dn}: For outdoor environments around commercial and public buildings (libraries and churches).

70 L_{dn}: For outdoor environments around industrial buildings.

***Policy 1.6*:** Minimize noise impacts of vehicle idling.

***Implementation Measure 1.6*:** Require buses and trucks parked anywhere in the city longer than five minutes to shut off their engines, except when they are actively unloading or loading passengers or goods.

City of Sonoma's Municipal Code Chapter 9.56, *Noise*, outlines noise limits applicable to sources within the City. General exterior noise level standards are outlined in **Table A3.11-8**.

TABLE A3.11-8: CITY OF SONOMA NOISE LEVEL STANDARDS (EXPRESSED IN DBA)

Property Zone or Type	Daytime Limits (intermittent)	Daytime Limits (constant)	Nighttime Limits (intermittent)	Nighttime Limits (constant)
Residential	60	50	50	40
Commercial/Mixed-Use	65	55	65	55
Public Property	Most restrictive noise limit applicable to adjoining private property.			

SOURCE: City of Sonoma, 2017.

Construction activities are exempt from the limits outlined in Table 3.11-8; however, they are limited to between the hours of 8:00 a.m. and 6:00 p.m. on Monday through Friday, between 9:00 a.m. and 6:00 p.m. on Saturdays, and between 10:00 a.m. and 6:00 p.m. on Sundays and holidays. Additionally, noise levels generated by construction equipment must not exceed 90 dBA at any point outside of the property line. The Code also states that the City may require that the owner or occupant of the construction site post the construction time restrictions at all entrances to the property to notify all contractors and subcontractors of basic noise requirements prior to commencing construction activities (City of Sonoma, 2008).

City of San Rafael

The City of San Rafael General Plan 2020 contains the following policies relevant to the Program (City of San Rafael, 2015):

N-10b. Mitigation for Construction Activity Noise. Through environmental review, identify mitigation measures to minimize the exposure of neighboring properties to excessive noise levels from construction-related activity.

The City of San Rafael Noise Ordinance establishes the following controls on construction-related noise. In pursuant with Table 8.13-2 in Section 8.15.050 of Chapter 8.13 of the San Rafael Noise Ordinance, standard exceptions to general noise limits are summarized in **Table A3.12-9**.

TABLE A3.12-9: CITY OF SAN RAFAEL STANDARD EXCEPTIONS TO GENERAL NOISE LIMITS

Type of Activity	Maximum Noise Level	Days/Hours Permitted
Construction	90 dBA	Mon-Fri 7:00 a.m. – 6:00 p.m. Sat 9:00 a.m. – 6:00 p.m. Sun, Hol. – prohibited Or as otherwise set by city approval

SOURCE: City of San Rafael, 2002.

Mitigation Measure 3.11-2a applies to the RWTF Treatment Capacity Expansion, Marin County Lower Novato Creek Project 1 – Distribution and Turnout to Wetlands, Recycled Water Distribution System Expansion to San Quentin Prison, Soscol WRF, Increase ECWRF Capacity, Urban Recycled Water Expansion, Recycled Water Distribution System Expansion – Phases 1 and 2, WRF Phase 2 Treatment Plant Upgrades projects, as wells as all of the programmatic projects.

Mitigation Measure 3.11-2b applies to the Increase ECWRF Capacity, Urban Recycled Water Expansion, Recycled Water Distribution System Expansion – Phase 1 and Recycled Water Distribution System Expansion – Phase 2, as well as all programmatic projects.

3.11.3 Direct and Indirect Effects

Impact by Service Area

Impact 3.11.1: Construction activity would result in a substantial temporary increase in ambient noise levels in the vicinity of Program projects during construction. (Less than Significant with Mitigation)

Novato SD

RWF Treatment Capacity Expansion. The expansion of the treatment capacity at the RWF would include the installation of additional tertiary filters, associated pipelines, mechanical equipment, and an additional chlorine contact tank within the developed area of the Novato SD-owned facility. The construction of these facilities are expected to begin in early 2022 and take approximately four months to complete.

Sensitive receptors located near the proposed RWF treatment capacity expansion construction areas consist of single-family residences located approximately 550 feet north of the RWF. A crane and grader are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a crane and grader running at the same time and place could generate a noise level of 82 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the construction area would be exposed to a noise level of 56 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, there would be **less-than-significant** impact with respect to substantial, temporary, or periodic increase in ambient noise levels during project construction.

Marin County Lower Novato Creek Project 1 – Distribution. The Marin County Lower Novato Creek Project 1 – Distribution project would consist of construction of distribution pipelines. The construction of these facilities is expected to begin in mid-2021 and take approximately three months to complete.

The closest sensitive land uses to the pipeline construction areas consist of single-family residences along Lois Drive with back yards immediately adjacent to where the pipeline would be constructed northwest of the North Deer Island Stormwater Basin. These single-family residences are located as close as 25 feet from where construction activities would occur. An excavator and crane are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, an excavator and generator running at the same time and place could generate a noise level of 83 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the construction area would be exposed to a noise level of 91 dBA L_{eq}. These sensitive land uses would be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}, representing a potentially significant impact under CEQA. After implementing **Mitigation Measure 3.11-1** the impact would be **less than significant with mitigation**.

Turnout to Wetlands. Construction of the turnout from the existing Novato SD outfall would consist of the installation of a hydraulic structure, flow slitting structure, and 100 linear feet of pipeline. The construction of these facilities are expected to begin in early-2021 and take approximately 2 weeks to complete.

The closest sensitive land use to the turnout construction area consist of single-family residences along Pizarro Avenue. These single-family buildings are located approximately 3,100 feet east of the proposed turnout. An excavator and generator are the two loudest pieces of off-road equipment that would operate during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, an excavator and generator running at the same time and place could generate a noise level of 83 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the construction area would be exposed to a noise level of 38 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

SVCSD

SVCSD Napa Road Pipeline. The construction of the Napa Road Pipeline project would consist of the installation of 11,500 linear feet of pipeline along Napa Road from 5th Street to just east of Nicolas Road. It is assumed that installation of the pipeline would proceed at a rate of approximately 100 feet per day and would require jack-and-bore crossing at East 8th Street and at a creek 650 feet east of Hyde Road. Construction of the pipeline would begin in early 2020 and would be expected to take approximately 6 months to complete.

The closest sensitive land uses to the proposed Napa Road Pipeline construction areas consist of clusters of single-family residences. These single-family residences would be located within 50 feet from onsite excavation and boring would occur. An excavator and saw are the two loudest pieces of off-road equipment that would be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, an excavator and saw running at the same time and place would generate a noise level of 85 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

MMWD

San Quentin Prison Recycled Water Distribution System. The proposed Recycled Water Distribution System would consist of 5,800 linear feet of pipeline connecting San Quentin Prison to the CMSA Treatment Plant, a dual-plumbing and connection at San Quentin Prison, one 50-hourspower pump station, a 0.08-million-gallon storage tank, a microfiltration treatment facility, and retrofit of the existing chlorine contact tanks. The construction of these facilities are expected to begin in late-2019 and take approximately 6 months to complete.

The closest sensitive land use to the construction area along the proposed Recycled Water Distribution System Expansion pipeline consists of single-family residences along Sir Francis Drake Boulevard and inmates at the San Quentin State Prison. The single-family buildings and inmate housing buildings at the San Quentin State Prison are located as close as approximately 100 feet and 150 feet of the proposed pipeline. An excavator and saw are the two loudest pieces of off-road equipment that would operate during project construction. Using the

reference noise levels provided in **Table 3.11-2** in Section 3.11, an excavator and saw operating at the same time and place could generate a noise level of 85 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest single-family residences and inmate sensitive receptors to the onsite construction areas would be exposed to a noise level of up to 77 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Napa SD

Soscol WRF Increased Filter Capacity and Soscol WRF Covered Storage. The proposed construction activities at the Soscol WRF would include the installation of a 1.7 mgd capacity tertiary filter and associated on-site mechanical equipment. All construction activities would occur within the existing Soscol WRF and would require minimal construction. The construction of these facilities is expected to begin when funding is secured and take approximately 4 months to complete.

The closest sensitive land use to Soscol WRF consist of scattered single-family residences located well over a mile east of the facility. At this distance, these sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Petaluma

Ellis Creek WRF Increased Capacity. Facility upgrades at the existing Ellis Creek WRF would include the construction of a 2.12 mgd capacity tertiary filter and associated onsite piping and pumps and UV disinfection lamps. All proposed facilities would be constructed within the existing Ellis Creek WRF. The construction of these facilities is expected to begin in mid-2019 and take approximately 8 months to complete.

The closest sensitive land uses to Ellis Creek WRF consist of two single-family residences located approximately 450 feet from where onsite construction activities would occur, across Lakeville Highway. A grader and generator are the two loudest pieces of off-road equipment that would operate during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a grader and crane running at the same time and place could generate a noise level of 82 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest single-family residences to the onsite construction areas would be exposed to a noise level of 66 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Urban Recycled Water Expansion. The Urban Recycled Water Expansion project would construct approximately 8 miles of recycled water pipelines throughout the eastern portion of the City of Petaluma extending from the end of the existing 20-inch-diameter pipeline that originates from the Ellis Creek WRF to serve customers currently being served by its potable water system. All proposed pipeline alignments would be along existing roadways with the City of Petaluma right-of-way. It is assumed that linear pipeline construction would occur at a rate of 100 feet per day and eight jack-and-bore crossing would be required at the following locations: one at North McDowell Boulevard, two at Sonoma Mountain Parkway, one at Lynch Creek, one at Lynch Creek at Maria Drive and Sunrise Parkway, one at U.S. Highway 101 and two at Caulfield Lane. The construction of these pipelines are expected to begin in late-2019 and take approximately 19 months to complete.

The closest sensitive land use to the proposed pipeline alignments consist of a single-family residences and Kenilworth Junior High School, which could be located as close as 50 feet from where onsite construction activities. A jack-and-bore rig and excavator are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a grader and crane running at the same time and place could generate a noise level of 83 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Agricultural Recycled Water Expansion – Phase 1 and 2. The City of Petaluma's Agricultural Recycled Water Expansion program would extend recycled water pipelines from the Ellis Creek WRF eastward to serve agricultural customers along Lakeville Highway. The expansion is divided into three separate phases. Phase 1 would extend approximately 1.3 miles of pipelines from Stage Gulch Road to Cannon Road. Phase 2 would extend approximately another 2.1 miles of pipelines from Stage Gulch Road. Lastly, Phase 3 would extend additional pipelines further south along Lakeville Highway off the Phase 2 terminus. Phase 3 construction noise increases are discussed programmatically below. The installation of the pipelines would require jack-and-boring crossings at Stage Gulch Road. The construction of these pipelines are expected to begin in late-2019 and take approximately eight days to complete.

The closest sensitive land use to Phase 1 and 2 pipelines consist of scatter single-family residences adjacent to Lakeville Highway, which are located as close as 50 feet from onsite construction activities would occur. A paver and crane are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a paver and crane running at the same time and place could generate a noise level of 81 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

American Canyon

Recycled Water Distribution System Expansion – Phase 1. Phase 1 of the Recycled Water Distribution System Expansion project would consist of the installation of 6,110 linear feet of 12-inch-diamemter and 3,070 linear feet of 6-inch-diameter pipelines. The construction of these pipelines are expected to begin in late-2018 and take approximately four months to complete.

The closest sensitive land use to Phase 1 pipelines consist of densely populated single-family residences adjacent to Benton Way and Spikerush Circle. These residences would be located within 50 feet from where onsite construction activities would occur. A pavers and crane are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-1** in Section 3.11, a paver and crane running at the same time and place could generate a noise level of 81 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Recycled Water Distribution System Expansion – Phase 2. Phase 2 of the Recycled Water Distribution System Expansion project would consist of the installation of 7,080 linear feet of 12-inch-diameter, 2,230 linear feet of 8-inch-diameter and 1,220 linear feet of 6-inch-diameter pipelines. Jack-and-bore crossing would be required at Highway 29 on- and off- ramps from main street, Eucalyptus Drive, S. Napa Junction Road, Donaldson Way East, railroad at Donaldson Way East. The construction of these pipelines are expected to begin in late-2019 and take approximately five months to complete.

The closest sensitive land use to Phase 2 pipelines consist of densely populated single-family residences adjacent to Highway 29 (from American Canyon Road to Napa Junction Road), Hess Road, Gold Valley Way, Brunello Drive and Pelleria Drive. A jack-boring machine and crane are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a jack-boring machine and crane running at the same time and place could generate a noise level of 80 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

WRF Phase 2 Treatment Plant Upgrades. This project would include facility upgrades at the existing American Canyon Water Reclamation Facility (American Canyon WRF) to increase tertiary treatment process to improve water quality for existing and future recycled water users. Phase 2 treatment plan upgrades at the existing American Canyon WRF would consist of the installation of one two-stage reverse osmosis (RO) system, modifications to ponds and addition of a concentrate disposal system, pipelines between the existing membrane bioreactor system (MBR) to the RO system, and pipelines between the RO system and the evaporation pond. All construction activities would occur within the American Canyon WRF. The construction

of these facilities and pipelines are expected to begin in late-2021 and take approximately six months to complete.

The closest sensitive land use to the American Canyon WRF consist of single-family residences located approximately 2,800 feet south east of the proposed project area. A grader and excavator are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a grader and excavator running at the same time and place could generate a noise level of 84 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest single-family residences to the onsite construction areas would be exposed to a noise level of 40 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

Storage Alternative

A summary of impact per service area is provided below.

Novato SD

This alternative would include two projects for Novato SD RWF Treatment Capacity Expansion and Seasonal Storage – SR37. Sensitive receptors located near the proposed RWF treatment capacity expansion and seasonal storage pond construction areas consist of single-family residences located approximately 550 feet north of the RWF and 2,600 feet south of the seasonal storage pond.

For this analysis it is assumed that a crane and grader are the two loudest pieces of off-road equipment that will be operating during the construction of the two projects, respectively. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a crane and grader running at the same time and place could generate a noise level of 82 dBA L_{eq} from a distance of 50 feet. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the proposed RWF treatment capacity expansion and seasonal storage pond construction area would be exposed to a noise level of 56 and 39 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, there would be **less-than-significant** impact with respect to substantial, temporary, or periodic increase in ambient noise levels during project construction.

SVCSD

The Storage Alternative would include construction of new seasonal storage pond at the Mulas site to allow SVCSD to store 49 AF of tertiary effluent during winter months to serve nearby agricultural customer demands in summer months. Sensitive receptors located near the proposed seasonal storage pond construction areas consist of single-family residences located approximately 3,100 feet east of the of the seasonal storage pond.

For this analysis it is assumed that a crane and grader are the two loudest pieces of off-road equipment that will be operating during the construction of proposed seasonal storage pond. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the proposed seasonal storage pond construction area would be exposed to a noise level of 37 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, there would be **less-than-significant** impact with respect to substantial, temporary, or periodic increase in ambient noise levels during project construction.

City of Petaluma

The Storage Alternative would include construction of two new seasonal storage ponds at a site southeast of the existing Ellis Creek WRF ponds to allow the City of Petaluma to store 300 AF of secondary effluent during winter months to later serve agricultural customers in summer months. Sensitive receptors located near the proposed seasonal storage pond construction areas consist of single-family residences located approximately 3,500 feet south of the of the seasonal storage ponds.

For this analysis it is assumed that a crane and grader are the two loudest pieces of off-road equipment that will be operating during the construction of proposed seasonal storage pond. Assuming a 7.5 dB per doubling of distance drop-off rate, the nearest sensitive receptors from the proposed seasonal storage pond construction area would be exposed to a noise level of 36 dBA L_{eq}. These sensitive land uses would not be exposed to noise levels that would exceed the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, there would be **less-than-significant** impact with respect to substantial, temporary, or periodic increase in ambient noise levels during project construction.

Napa SD

The Storage Alternative would include construction of two new seasonal storage ponds to store 600 AF recycled water from Soscol WRF and expanding the Napa SD recycled water distribution system to supply recycled water to more customers. Sensitive receptors located near the proposed seasonal storage pond and Napa SD recycled water distribution system pipeline construction areas consist of single-family residences located approximately 50 feet east of the of the seasonal storage pond and within the 50 feet of the proposed pipeline.

For this analysis it is assumed that a jack-and-bore rig and excavator are the two loudest pieces of off-road equipment that will be operating during project construction. Using the reference noise levels provided in **Table 3.11-2** in Section 3.11, a grader and crane running at the same time and place could generate a noise level of 83 dBA L_{eq} from a distance of 50 feet, which is below the applied FTA noise increase threshold of 90 dBA L_{eq}. Under CEQA, the temporary increase in ambient noise would result in an impact that would be **less than significant**.

APPENDIX 3.11B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to noise and vibration.

POTENTIAL IMPACTS AND SIGNIFICANCE – NOISE AND VIBRATION

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.11.1: Construction activity would result in a substantial, temporary, or periodic increase in ambient noise levels in the project vicinity during construction.							
Proposed Action	LS	LSM	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LSM	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.11.2: Construction activity would violate standards established in the local general plans or noise ordinances, and/or would adversely affect nearby sensitive receptors.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LSM	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative	(a)	LSM	NI	NI	(a)	(a)	LSM
Impact 3.11.3: Construction activity could expose sensitive receptors to excessive ground-borne vibration levels.							
Proposed Action	LS	LS	LS	LS	LSM	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.11.4: Substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project during operations.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.11.5: Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies during operations.							
Proposed Action	LS	LS	LS	LS	LSM	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.12
Hazards and Hazardous Materials

3.12A. Regulatory Framework
3.12B. Impact Summary by Service Area

APPENDIX 3.12A
Regulatory Framework

3.12.2 Regulatory Framework

Federal

The USEPA is the lead federal agency responsible for enforcing federal regulations regarding hazardous materials. The primary legislation governing hazardous materials are the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA).

Resource Conservation and Recovery Act, Toxic Substances Control Act, and Hazardous and Solid Waste Act

Implementation of the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA) of 1976 resulted in the creation of a major federal hazardous waste regulatory program that is administered by USEPA. USEPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended by the associated Hazardous and Solid Waste Amendments (HSWA), which affirmed and extended the concept of regulating hazardous wastes from generation through disposal. HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous wastes. Under RCRA, individual states may implement their own hazardous waste programs instead of RCRA, as long as the state program is at least as stringent as the federal RCRA requirements. USEPA approved California's program to implement federal hazardous waste regulations on August 1, 1992.

Comprehensive Environmental Response, Compensation, and Liability Act, and the Superfund Amendments and Reauthorization Act

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund or CERCLA, provides for the response and cleanup of hazardous substances that may endanger public health or the environment. The Superfund Amendments and Reauthorization Act (SARA) amended Superfund to increase state involvement and required Superfund actions to consider state environmental laws and regulations. Relevant to this project, SARA also established a regulatory program for the Emergency Planning and Community Right-to-Know Act. The applicable part of SARA for the proposed action is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986. Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key provisions require notification when extremely hazardous substances are present above their threshold planning quantities, immediate notification to the local emergency planning committee and the state emergency response commission when a hazardous material is released in excess of its reportable quantity, and that material safety data sheets for all hazardous materials or a list of all hazardous materials be submitted to the state and local emergency planning agencies and local fire department.

Occupational Safety and Health Act

The Occupational Safety and Health Act was passed to address employee safety in the workplace. The act created the Occupational Safety and Health Administration (OSHA), whose mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. Some OSHA regulations contain standards related to hazardous materials handling, including workplace conditions, employee protections requirements, first aid, and fire protection.

U.S. Department of Transportation Hazardous Materials Transport Act

The U.S. Department of Transportation (USDOT), in conjunction with USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the USDOT to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. CFR 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Federal Aviation Regulations Part 77

Part 77 of the Federal Aviation Regulations, "Safe, Efficient Use and Preservation of the Navigable Airspace" has been adopted as a means of monitoring and protecting the airspace required for safe operation of aircraft and airports. Objects that exceed certain specified height limits constitute airspace obstructions. Federal Aviation Regulations Section 77.13 requires that the Federal Aviation Administration (FAA) be notified of proposed construction or alteration of certain objects within a specified vicinity of an airport, including:

1. Any construction or alteration of more than 200 feet in height above the ground level at its site.
2. Any construction or alteration of greater height than an imaginary surface extending outward and upward at [a slope of] 100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway of each [public-use airport, public-use airport under construction, or military airport] with at least one runway more than 3,200 feet in actual length, excluding heliports.

State

The California Department of Toxic Substances Control (DTSC) is primarily responsible for the regulation of hazardous materials in California. DTSC is responsible for the management of hazardous substances and oversees the investigation and remediation of contaminated sites. The San Francisco Bay Regional Water Quality Control Board (RWQCB) is primarily responsible for the protection of groundwater and surface water resources from hazardous materials.

NPDES Construction General Permit

The Construction General Permit is discussed in Section 3.2 3.2 *Geology, Soils, Mineral Resources, and Paleontological Resources*. The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater and moving off site into receiving waters.

California Hazardous Waste Control Law, California Health and Safety Code, Division 20, Chapter 6.5

The Hazardous Waste Control Act of 1972, codified in Health and Safety Code Sections 25100 et seq., created the State hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The Act is implemented by regulations contained in CCR Title 26, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location.

California Occupational Safety and Health Act

The California Occupational Safety and Health Act of 1973, codified in California Labor Code, Sections 6300 et seq., addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. The act also created the California Occupational Safety and Health Administration (Cal OSHA), the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal OSHA's standards are generally more stringent than federal regulations. Under Cal OSHA standards, the employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337–340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

In addition, Cal OSHA regulations indirectly protect the general public by requiring construction managers to post warnings signs, limit public access to construction areas, and obtain permits for work considered to present a significant risk of injury, such as excavations greater than five feet.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program), codified in Health and Safety Code Sections 25404 et seq., requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The following Program Elements are consolidated under the Unified Program:

1. Hazardous Waste Generator and On-Site Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting);
2. Aboveground Petroleum Storage Tanks and Spill Prevention Control and Countermeasure Plans (SPCCs);
3. Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or "Community-Right-To-Know");
4. California Accidental Release Prevention Program;
5. Underground Storage Tank (UST) Program; and
6. Uniform Fire Code Plans and Inventory Requirements.

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. The CUPAs in the project area include the County of

Marin Public Works Department, the County of Sonoma Department of Emergency Services, Hazardous Materials Division, and the County of Napa Department of Environmental Management.

Hazardous Materials Release Response Plans and Inventory Act

The Hazardous Materials Release Response Plans and Inventory Act of 1985, codified in Health and Safety Code, Sections 25500 et seq., also known as the Business Plan Act, requires businesses using hazardous materials to prepare a Hazardous Materials Business Plan (HMBP) that describes their facilities, inventories, emergency response plans, and training programs. HMBPs contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed. This code and the related regulations in 19 California Code of Regulations (CCR) Sections 2620 et seq. require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a HMBP to their local CUPA and to report releases to their CUPA and the State Office of Emergency Services. The California Office of Emergency Services is responsible for implementing the accident prevention and emergency response programs established under the Act and implementing regulations.

Safe Drinking Water and Toxics Enforcement Act (Proposition 65)

Administered by the CUPA, the Safe Drinking Water and Toxics Enforcement Act requires businesses, which use hazardous materials to post public notice of release of any accidental hazardous materials, or other potential exposure to materials known to the State of California to cause cancer or reproductive toxicity. The Act prohibits such businesses from releases of hazardous materials into the environment at levels above identified risk levels.

Utility Notification Requirements

The regulations in 8 CCR Section 1541 require excavators to determine the approximate locations of subsurface installations, such as sewer, telephone, fuel, electric, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation. The California Government Code (Sections 4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center. According to Section 4216.1, operators of subsurface installations who are members of, participate in, and share in the costs of a regional notification center, such as Underground Services Alert of Southern California, more commonly referred to as DigAlert, are in compliance with this section of the code. DigAlert receives planned excavation reports from public and private excavators and transmits those reports to all participating members that may have underground facilities at the location of excavation. Members will mark or stake their facilities, provide information, or give clearance to dig.

California Fire Code

The California Fire Code (Chapter 27) and 24 CCR, Part 9, Sections 2700 et seq. includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

1. Separation of incompatible materials with a noncombustible partition, or appropriate distance separation;
2. Spill control in all storage, handling, and dispensing areas; or
3. Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

California Fire Code (Chapter 14) addresses fire safety during construction and demolition and includes requirements for smoking, waste disposal, cutting and welding, fire protection equipment, fire reporting, access for firefighting.

License to Transport Hazardous Materials

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the State of California Vehicle Code Section 32000.5 for transportation of hazardous materials shipments for which the display of placards is required by State regulations; or hazardous materials shipments of more than 500 pounds, which would require placards if shipping greater amounts in the same manner.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the State Vehicle Code Sections 32100–33002. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150–1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157–1157.8).

California Manual on Uniform Traffic Control Devices

The California Manual on Uniform Traffic Control Devices (California MUTCD) is published by the State of California, Department of Transportation (Caltrans) and is issued to adopt uniform standards and specifications for all official traffic control devices, in accordance with Section 21400 of the California Vehicle Code. Part 6 Temporary Traffic Control provides the regulations for temporary lane closures or construction activities that could affect the flow of traffic.

Prohibited Activities in Forests, Forestry and Range and Forage Lands – California Public Resources Code, Section 4411 et seq.

The California Public Resources Code (PRC) restricts the use of internal combustion engines in forest-, brush-, and grass-covered lands; specifies requirements for the safe use of gasoline-powered tools in fire hazard areas; and specifies fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. More specifically, the PRC requires the following:

1. Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor[1] to reduce the potential for igniting a wildland fire (PRC Section 4442).
2. Appropriate fire suppression equipment must be maintained during the highest fire danger period—from April 1 to December 1 (PRC Section 4428).
3. On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).
4. On days when a burning permit is required, use of portable tools powered by gasoline-fueled internal combustion engines are prohibited within 25 feet of any flammable materials (PRC Section 4431).

Contractors would be required to comply with state restrictions regarding the use of internal combustion engines in forest-, brush-, and grass-covered lands, which would make the proposed action consistent.

[1] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

Local

General Plans

This section lists the goals and policies in the general plans for the cities and counties in the project area that could apply to hazardous materials and the proposed action.

Unincorporated Marin County

The Marin Countywide Plan (amended through 2014) sets forth the following goals, objectives, and policies regarding hazards and hazardous materials that are applicable to the proposed action:

Goal PS-4: Prevent unnecessary exposure of people and property to risks of damage or injury from hazardous materials.

***Objective PS-4.2*:** Regulate the handling, storage, use, and disposal of hazardous materials in order to reduce the risks of damage and injury from hazardous materials.

Policy PS-4a: While maintaining the autonomy granted to it pursuant to State zoning laws, implement Federal, State, and County requirements for the storage, handling, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans.

Policy PS-4c: Require a use permit for any commercial or industrial use involving hazardous materials in threshold planning quantities as determined by Federal and State laws. Hazardous materials management plans shall be required as a condition of approval for such permits.

Goal PS-3: Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.

***Objective PS-3.2*:** Regulate new development to reduce the risks of damage and injury from known fire hazards to acceptable levels.

Policy PS-3b: Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with the Public Safety Element in the review of projects.

Policy PS-3l: Require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural exempt buildings.

City of San Rafael

The City of San Rafael General Plan 2020 (amended through 2013) establishes the following goals, policies and implementation actions regarding hazards and hazardous materials that are applicable to the proposed action:

General

Goal 30: A Safe Community. It is the goal of San Rafael, as the first priority for city government, to provide excellent fire, public safety and paramedic services and to be prepared in the case of disaster or emergency.

Policy S-3: Location of Public Improvements. Avoid locating public improvements and utilities in areas with identified flood, geologic and/or soil hazards to avoid any extraordinary maintenance and operating expenses. When the location of public improvements and utilities in such areas cannot be avoided, effective mitigation measures will be implemented.

Hazardous Materials

Policy S-10: Location of Public Improvements. To minimize threat to human health or any extraordinary construction and monitoring expenses, avoid locating improvements and utilities in areas with dangerous levels of identified hazardous materials. When the location of public improvements and utilities in such areas cannot feasibly be avoided, effective mitigation measures will be implemented.

Policy S-12: Use of Environmental Databases in Development Review. When development is proposed, determine whether the site has been recorded as contaminated. Undertake appropriate studies to assure identification and implementation of mitigation measures for sites on or near identified hazards.

Action S-12a: Environmental Database. Maintain environmental and hazardous materials-related databases, and update information on an ongoing basis. In addition, include the information in the state GeoTracker database (database of contaminated Underground Storage Tank sites).

Action S-12b: Environmental History. Through the environmental review process, provide information concerning available environmental history of a site and proposed mitigation measures if warranted.

Policy S-13:Potential Hazardous Soils Conditions. Where development is proposed on sites with known previous contamination, sites filled prior to 1974 or sites that were historically auto service, industrial or other land uses that may have involved hazardous materials, evaluate such sites for the presence of toxic or hazardous materials. The requirements for site-specific investigation are contained in the Geotechnical Review Matrix.

Action S-13b: Hazardous Soils Cleanup. Require remediation and cleanup in accordance with regional and local standards in order to develop on sites where hazardous materials have impacted soil or groundwater. At a minimum, remediation and cleanup of contaminated sites shall be in accordance with regional and local standards. The required level of remediation and clean-up shall be determined by the Certified Unified Program Agency (CUPA) based on the intended use of the site and health risk to the public.

Policy S-14: Hazardous Materials Storage, Use, and Disposal. Enforce regulations regarding proper storage, use and disposal of hazardous materials to prevent leakage, potential explosions, fires, or the escape of harmful gases, and to prevent individually innocuous materials from combining to form hazardous substances, especially at the time of disposal.

Action S-14a: CUPA Program. Continue to participate in the CUPA program.

Policy S-15: Hazardous Waste Management. Support measures to responsibly manage hazardous waste consistent with protection of the public health, welfare, safety and the environment. The City of San Rafael supports the Marin County Hazardous Waste Management Plan as adopted by the State, County and Cities within Marin County.

See S-14a. (CUPA Program)

Policy S-16: Transportation of Hazardous Materials. Enforce federal, state and local requirements and standards regarding the transportation of hazardous materials. Support, as appropriate, legislation that strengthens safety requirements for the transportation of hazardous materials.

Action S-16a: Safe Transport of Hazardous Materials. Support California Highway Patrol's efforts to ensure the safe transport of hazardous materials.

Policy S-31: New Development in Fire Hazard Areas. Design new development located on or adjacent to natural hillsides to minimize fire hazards to life and property.

S-31a: New Development. Through the development review process, require appropriate mitigation measures such as fire preventive site design, landscaping and building materials, and the use of fire suppression techniques such as sprinklering.

City of Novato

The City of Novato General Plan 2035 (2016 public review draft), lists the following goals and policies with regard to hazards and hazardous materials that are applicable to the proposed action:

Goal SH 1: Maintain high levels of public safety and emergency preparation.

SH 3: Fire Hazards. Reduce the risk of loss of life, personal injury and property damage resulting from wildland and urban fire hazards through code enforcement and coordination with the Novato Fire Protection District.

SH 3a: Fire Risk in New Development.

1. Review all development proposals for fire risk, and require mitigation measures to reduce the probability of fire. Encourage attractive native and drought-tolerant, low-maintenance landscaping responsive to fire hazards. Require all new development to meet the adopted state and local fire codes.
2. Require adequate access for emergency vehicles, adequate street width and vertical clearance, driveway access and parking restrictions for new development.
3. Ensure new development meets the peak load water supply standard for fire hydrants of the Novato Fire Protection District.
4. All development that includes private access roads or fire roads shall provide recorded access rights and keys to any gates to the Novato Fire Protection District.

SH 3b: Fire Sprinklers. Continue to enforce the Fire Safety Ordinance requirements for sprinkler systems for new commercial/industrial and residential development and substantial remodels.

SH 3c: Wildland-Urban Interface. Require new development within Wildland-Urban Interface Areas (the Novato project components are within this area) to develop and implement a Vegetation Management Plan in accordance with City and Fire District regulations and requirements.

SH 3d: Vegetation Management. Manage public lands as appropriate and feasible to minimize the chances of a wildfire affecting residences and businesses while maintaining habitat functions and values. Request that the Marin County Open Space District and other public agencies assess and reduce the wildland fire hazards on their holdings within and adjacent to the City.

SH 5: Hazardous Materials. Minimize risks and health impacts from environmental and human-induced disasters.

SH 5a: Measures to Reduce Hazards. Consider measures to protect the public health from the hazards associated with the transportation, storage, and disposal of hazardous wastes. Continue to refer land use and transportation decisions and other programs involving hazardous materials regulations to the appropriate regulatory agencies.

Sonoma County

The Sonoma County Draft General Plan Update 2020 (amended through 2014) establishes the following goals, objectives, and policies with respect to hazards and hazardous materials that are applicable to the proposed action:

Goal PS-4.1: Prevent unnecessary exposure to people and property to risks of damage or injury from hazardous materials.

***Objective PS-4.2*:** Regulate the transport, storage, use, and disposal of hazardous materials in order to reduce the risks of damage and injury from hazardous materials to acceptable levels.

Policy PS-4a: While maintaining the autonomy granted to it pursuant to state zoning laws, implement state and county requirements for the storage, transport, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans.

Policy PS-4c: Require a use permit for any commercial or industrial use involving significant quantities of hazardous materials. Hazardous materials management plans shall be required as a condition of approval of such permits.

Policy PS-4d: Where allowed by law, regulate the transportation of hazardous materials to minimize the potential for damage. Seek regulation by other agencies consistent with adopted County policies.

Policy PS-4g: Prepare a draft "Hazardous Materials Management Plan," which provides for the long-term prevention of releases of hazardous materials, effective responses to such releases, the safe transport and disposal of hazardous wastes, and a public information program.

Goal PS-3: Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.

***Objective PS-3.1*:** Continue to utilize complete data on wildland and urban fire hazards.

***Objective PS-3.2*:** Regulate new development to reduce the risks of damage and injury from known fire hazards to acceptable levels.

Policy PS-3a: Continue to utilize available information on wildland and structural fire hazards.

Policy PS-3b: Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with this element in the review of projects.

Policy PS-3c: Continue to adopt revisions to the Uniform Fire and Building Code and other standards which address fire safety as they are approved by inspection organizations and the State of California. Review, revise, and/or adopt existing or new local codes, ordinances, and Fire Safe Standards to reflect contemporary fire safe practices.

Policy PS-3d: Require on-site detection and suppression, including automatic sprinkler systems, where available services do not provide acceptable levels of protection.

Policy PS-3e: Refer projects and code revisions to the Department of Emergency Services and responsible fire protection agencies for their review and comment.

Policy PS-3g: Encourage strong enforcement of state requirements for fire safety by the California Department of Forestry.

Policy PS-3l: Work with the California Department of Forestry and Fire Protection to identify areas of high fire fuel loads and opportunities to reduce those fuel loads in "areas with very high or high potential for large wildland fires" and High Fire Hazard Severity Zones.

City of Sonoma

The City of Sonoma 2006-2020 General Plan Update sets forth the following goals, policies, and implementation measures with respect to hazardous materials and wildland fires:

Goal PS-1: Minimize risks to life and property associated with seismic and other geologic hazards, fire, hazardous materials, and flooding.

***Policy 1.3*:** Ensure that all development projects provide adequate fire protection.

Implementation Measure 1.3.1: Review all proposed actions for adequacy of fire protection, including: response time; emergency access, water supply, and fire flow; vegetation clearance and visible addressing; spacing between buildings; construction materials; and refuse removal.

***Policy 1.4*:** Coordinate and maximize emergency medical service and firefighting capabilities in the city and Sonoma Valley.

Implementation Measure 1.4.3: Work with Schell-Vista Fire District to monitor fire safety and hazardous material use, storage, and transport in the Eighth Street East area.

***Policy 1.6*:** Ensure that all operations that use, store, and/or transport hazardous materials to comply with all applicable regulations.

Implementation Measure 1.6.1: Maintain contingency plans for responding to spills, accidents, and fires involving hazardous materials.

Implementation Measure 1.6.2: Provide information to assist businesses in complying with regulations regarding use, storage, and transport of hazardous materials.

City of Petaluma

The City of Petaluma General Plan 2025 (amended through 2012) sets forth the following policies and programs with respect to hazardous materials and wildland fires:

10-P-4: Minimize the risk to life and property from the production, use, storage, and transportation of hazardous materials and waste by complying with all applicable State and local regulations.

Require compliance with Sonoma's Countywide Integrated Waste Management Plan as well as all of the CUPA program elements.

Napa County

The Napa County General Plan Update (amended through 2013) includes the following goals and action items regarding hazardous materials applicable to the proposed action:

Goal SAF-5: All development projects proposed on sites that are suspected or known to be contaminated by hazardous materials and/or are identified in a hazardous material/waste search shall be reviewed, tested, and remediated for potential hazardous materials in accordance with all local, state, and federal regulations.

***Action Item SAF-31.1*:** The County shall require written confirmation from applicable local, regional, state, and federal agencies that known contaminated sites have been deemed remediated to a level appropriate for proposed land uses, prior to the County approving site development or require an approved remediation plan that demonstrates how contamination will be remediated prior to site occupancy. This documentation will specify the extent of development allowed on the remediated site as well as any special conditions and/or restrictions on future land uses.

Goal SAF-3: It is the goal of Napa County to effectively manage forests and watersheds, and to protect homes and businesses from fire and wildfire and minimize potential losses of life and property.

***Policy SAF-16*:** Consistent with building and fire codes, development in high wildland fire hazard areas shall be designed to minimize hazards to life and property.

Action Item SAF-16.1: Develop site criteria and construction standards for development in high fire hazard areas, and adopt standards to restrict urbanizing these areas as defined in Policy AG/LU-27 unless adequate fire services are provided.

***Policy SAF-20*:** All new development shall comply with established fire safety standards. Design plans shall be referred to the appropriate fire agency for review of the following:

1) Adequacy of water supply.
2) Site design for fire department access in and around structures.
3) Ability for a safe and efficient fire department response.
4) Traffic flow and ingress/egress for residents and emergency vehicles.
5) Site-specific built-in fire protection.
6) Potential impacts to emergency services and fire department response.

City of Napa

The City of Napa General Plan (amended through 2015) establishes the following goals and policies with respect to hazards and hazardous materials that are applicable to the proposed action:

Goal HS-7: To reduce the risks to health and safety from hazardous wastes.

***Policy HS-7.3*:** The City shall support the County's role as CUPA for all County jurisdictions.

Goal HS-5: To reduce the risk to life and property from wildland fires.

***Policy HS-5.1*:** The City shall require that development in wildland urban interface areas provides adequate access roads, onsite fire protection systems, signage, ignition resistant building materials, and defensible space.

***Policy HS-5.2*:** The City shall continue to implement the California Fire Code as the City's basic regulations for fire prevention and suppression.

***Policy HS 5-3*:** The City shall implement the requirements of Chapter 7A (Materials and Construction Methods for Exterior Wildfire Exposure) if the California Building Code in or adjacent to Wildland/Urban Interface areas.

City of American Canyon

The American Canyon General Plan (amended through 2010) sets forth the following goals, objectives, and policies with respect to hazardous materials and wildland fires:

Goal 6A: Maintain a high level of fire protection and emergency services to City/District businesses and residences.

***Objective 6.4*:** Utilize proactive measures to ensure protection of life and property of City and District residents and to maximize use of available resources.

Policies 6.4.1: Continue to implement an ordinance requiring built-in fire protection for most building types, including single- and multi-family residential, to: a. minimize the potential for loss of life and property, and b. allow for the provision of a high level of fire protection services while reducing the needs for additional staff and equipment.

Policy 6.4.3: Require, through the development review process, that all structures and facilities subject to the District's jurisdiction adhere to City, state and federal regulatory standards such as the Uniform Building and Fire Codes and other applicable safety guidelines.

APPENDIX 3.12B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to hazards and hazardous materials.

POTENTIAL IMPACTS AND SIGNIFICANCE – HAZARDS AND HAZARDOUS MATERIALS

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.12.1: Use or Spills of Hazardous Materials							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative:	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.12.2: Proximity to Schools							
Proposed Action	NI	NI	LSM	NI	NI	LSM	NI
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative:	(a)	NI	LS	NI	(a)	(a)	NI
Impact 3.12.3: Location on a Listed Hazardous Materials Site							
Proposed Action	NI	NI	LSM	NI	NI	LSM	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.12.4: Proximity to Airports or Airstrips							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.12.5: Interference with Emergency Response Services or an Emergency Evacuation							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.12.6: Wildland Fires							
Proposed Action	LSM	NI	LSM	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	LSM	NI	(a)	(a)	NI

NOTES:

NI = No Impact
LS = Less than Significant, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.13
Public Services and Utilities

3.13A. Setting and Regulatory Framework
3.13B. Impact Summary by Service Area

APPENDIX 3.13A
Setting and Regulatory Framework

3.13.1 Affected Environment

Marin County

The MMWD and Novato SD service areas are located in Marin County. Their service areas include the City of San Rafael, City of Novato, and unincorporated Marin County. This discussion presents Marin County resources first, followed by that for the jurisdictions within which NBWRP Phase 2 elements would be located.

MMWD and Novato SD: Unincorporated Marin County

Public Services

Police Protection. The Marin County Sherriff's Department, headquartered at 1600 Los Gamos Dr. #200 in San Rafael, provides police protection throughout Marin County. Three substations of the department provide service to the southern Marin, Kentfield, and Point Reyes regions of unincorporated areas of the county. The Marin County Sherriff Department has approximately 199 sworn deputies and 114 law enforcement professionals and is divided into three major bureaus: Administrative and Support Services, Detention Services, and Field Services in addition to operating the countywide Major Crime Task Force (Marin County Sheriff's Office, 2016).

Fire Protection. The Marin County Fire Department provides urban search and rescue, water rescue and has a hazardous materials and confined space response teams, in addition to providing fire protection support to the neighboring unincorporated jurisdictions.

Emergency Medical Services. The Marin County Emergency Medical Services program is responsible for the planning, implementation and evaluation of the EMS system established to provide pre-hospital services. When required, two private ambulance providers, American Medical Response and St. Joseph Ambulance Service, provide transportation to Marin General Hospital in Greenbrae which is the County's trauma center (Marin County, 2017a).

Medical Facilities. Please refer to the discussion of the MMWD and Novato SD service areas below for a discussion of nearby medical facilities.

Schools. Schools located in the areas of Marin County affected by NBWRP Phase 2 are in the cities of San Rafael and Novato (see below for detailed information).

Libraries. Marin County has a Free Library System that serves the unincorporated parts of Marin County and participating cities. There are 10 participating library locations in this system and numerous cooperating libraries (facilitating media borrowing) which are owned and managed by the local municipalities and colleges. The library branches closest to the NBWRP Phase 2 elements are discussed below.

Utilities

Please refer to the discussion of the MMWD and Novato SD service areas below for a discussion of sanitary sewer, solid waste, and electricity services specific to those areas.

Water. Marin County's water supplies include surface water, groundwater, recycled water and imported water. Surface water is the main source for urban areas in the eastern portion of the county while groundwater is the primary supply for unincorporated areas. Imported water is from the Sonoma County Water Agency (SCWA). SCWA direct customers are eight cities and special districts in Sonoma and northern Marin counties. Please refer to the discussion of the MMWD and Novato SD service areas for a discussion of potable water services in each area (SCWA, 2017b).

Hazardous Waste Facilities. The Marin Recycling Center operates a household hazardous waste facility as a joint program with the City of San Rafael and the Marin County Waste Management Joint Powers Authority. The Household Hazardous Waste Facility is located at: 565 Jacoby Street in San Rafael. The facility disposes of household hazardous waste from residents of Marin County, with the exception of Novato. It also disposes small quantities of hazardous waste from businesses for a fee (Marin Sanitary Service, 2017). The Novato Recycling Center at 7576 Redwood Boulevard in Novato operates a similar household hazardous waste facility in the Novato SD service area.

MMWD: City of San Rafael

Public Services

Police Protection. The City of San Rafael Police Department, headquartered at 1400 Fifth Avenue in San Rafael, provides police protection in the NBWRP Phase 2 area with the city. The Chief of Police directs a staff of 63 sworn and 27 non-sworn employees. The Patrol Bureau provides uniformed police services 24 hours a day. It is divided equally into two sub-units, the Footbeat Unit and the Directed Patrol Unit, comprised of approximately 20 members, managed by Police Lieutenants (City of San Rafael, 2017a).

The Central Marin Police Authority (CMPA) is a full-service police agency serving the communities of Corte Madera, Larkspur, San Anselmo, and portions of Greenbrae. The CMPA was formed in 2013 consolidating police services for several communities in Marin County. CMPA currently employs 58 full-time personnel including 45 sworn officers and 13 other staff members (CMPA, 2017).

Fire Protection. The San Rafael Fire Department, headquartered at 1039 C. Street in San Rafael, provides fire protection to homes and businesses in the NBWRP Phase 2 area within the city. The Larkspur Fire Department also provides fire and emergency medical services in the area with two stations, including Station 1 located at 420 Magnolia Ave next to Larkspur City Hall, and Station 2, located at 15 Barry Way.

Emergency Medical Services (EMS). The Paramedic Zone B Provider Agency, San Rafael Fire Department, provides emergency medical service to the project area (Marin County HHS, 2017).

Medical Facilities. The closest medical facilities to the NBWRP Phase 2 area with the city are the Kaiser Hospital San Rafael and the Marin General Hospital. The Kaiser Hospital San Rafael is located at 99 Montecillo Road in San Rafael. This medical center provides emergency and urgent care as well non-emergency medical services (Kaiser Permanente, 2017). The Marin General Hospital is located at 250 Bon Air Road in Greenbrae and offers both emergency and non-emergency medical services (Marin General Hospital, 2017).

Schools. The Larkspur-Corte Madera School District, the Tamalpais Union High School District, San Rafael City School and Dixie School Districts oversee public schools in the NBWRP Phase 2 area. The schools closest to the project area are Pickleweed Children's Center, San Rafael High School, Bahia Vista Elementary, Redwood High School, San Andreas High School, Hall Middle School, and Tamiscal High School.

Libraries. The City of San Rafael is a member of the Marin County Free Library System. The libraries closest to the project area are the San Rafael Pickleweed Library (50 Canal St.), the Corte Madera Library (707 Meadowsweet Dr. Corte Madera) and main City of San Rafael library (1100 E St.) (Marin County, 2017b).

Utilities

Water. Marin Municipal Water District (MMWD) provides potable water in the area. MMWD obtains 75 percent of the water consumed annually from rainfall collected in seven area reservoirs throughout Marin County. Five of the reservoirs are in the Mount Tamalpais Watershed and the other two are located in West Marin. The remaining 25 percent of the water comes from the Russian River in Sonoma County under contract with SCWA. Less than 2 percent of its supply is from recycled water (MMWD, 2017).

Sewer. Wastewater treatment services in the project area are provided by the San Rafael Sanitation District (SR Sanitation District). The San Rafael Sanitation District employs a crew of eight maintaining 32 pump stations, 13 miles of force main, 132 miles of sewer pipelines to provide services to Central San Rafael south of Puerto Suello Hill and some neighboring unincorporated areas. Wastewater collected in this service area is transported to the CMSA facility for treatment (City of San Rafael, 2017b). The CMSA operates the largest wastewater treatment facility in Marin County. Currently, approximately six billion gallons of wastewater are treated and discharged into San Francisco Bay annually (CMSA, 2018).

Solid Waste Processing and Disposal Facilities. The Marin Sanitary Service provides weekly garbage and recycling collection services to residential and commercial customers. They currently service more than 32,000 residential and commercial accounts.

Hazardous Waste Facilities. Please refer to the hazardous waste facilities in the discussion of Marin County above.

Electricity. Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to businesses and residences in the City of San Rafael and adjacent portions of unincorporated Marin County. PG&E is responsible for maintaining the physical infrastructure for gas and electrical distribution. Marin Clean Energy also provides electrical service in Marin County utilizing solar and other renewable energy provided to customers through PG&E's distribution system (Marin Clean Energy, 2018).

Novato SD: City of Novato

Public Services

Police Protection. The Novato Police Department headquartered at 909 Machin Avenue provides police protection in the project area. The department is a full- service agency consisting of an operations division and an administrative services division each lead by a police captain. The department currently employs approximately 84 staff members, including 60 sworn personnel and coordinates a volunteer program. (City of Novato, 2018).

Fire Prevention and Protection. The Novato Fire Protection District (NFPD) provides fire protection services to homes and businesses in the area. The NFPD's Emergency Response Section consists of three divisions: Training, EMS, and Operations. The Operations Division is comprised of the emergency response personnel and equipment. The daily emergency response staffing is 20 personnel, which include one battalion chief, four 3-person engine companies, one 3-person truck company, and two 2-person paramedic ambulances. Stations closest to any NBWRP Phase 2 elements are Fire Station 61 (7025 Redwood Boulevard), Fire Station 62 (450 Atherton Avenue), Fire Station 63 (65 San Ramon Way.), Fire Station 64 (319 Enfrente Drive), and Fire Station 65 (5 Bolling Drive) (NFPD, 2017).

Emergency Medical Services. Emergency medical services are provided in Novato by NFPD (see above).

Medical Facilities. The closest medical facilities to the NBWRP Phase 2 elements are the Novato Community Hospital in Novato, Kaiser Hospital San Rafael, and the Marin General Hospital. The Novato Community Hospital is located at 180 Rowland Way in Novato. This medical center is a Sutter Healthcare affiliate and provides non-emergency medical service (Novato Community Hospital, 2013). The Kaiser Hospital San Rafael and Marin General Hospital are discussed above under MMWD.

Schools. The Novato City School District oversees public schools in the project area. The schools closest to the project area are Hamilton, Loma Verde, Lu Sutton, Lynwood, Olive, Pleasant Valley, Rancho and San Ramon Elementary, all of which have students in grades Kindergarten through 5 (K-5):

The City of Novato has three sixth- through eighth-grade middle schools: Hill Middle School (720 Diablo Avenue), San Jose Middle School (1000 Sunset Parkway), and Sinaloa Middle School (2045 Vineyard Way). Students from the middle schools continue to Novato High School (625 Arthur Street) or San Marin High School (15 San Marin Drive) (NUSD, 2018).

Libraries. The City of Novato is a member of the Marin County Library System. The location closest to any NBWRP Phase 2 elements is Novato Library at 1720 Novato Boulevard (Marin County, 2017a).

Utilities

Water. The North Marin Water District (NMWD) supplies Novato with potable water. NMWD purchases approximately 80 percent of its supply from SCWA. SCWA water is collected from the Russian River and transports water to NMWD via the North Marin Aqueduct. The remaining approximately 20 percent of NMWD water supply comes from Stafford Lake, which is treated at the Stafford Water Treatment Plant. NMWD also receives recycled water from Novato SD and the Las Gallinas Valley Sanitary District (City of Novato, 2016).

Sewer. Novato SD is responsible for treatment of wastewater in Novato. Wastewater is treated at the Novato Waste Water Treatment Plant (WWTP) at 500 Davidson Street, which is permitted for a design average day dry weather flow of 7.0 mdg. The Recycled Water Facility (RWF) is located on the WWTP site and can produce up to 1.7 million gallons per day (gpd) of tertiary treated recycled water meeting Title 22 standards (Novato SD, 2017). This tertiary recycled water is used to irrigate large landscapes in the Novato area, including up to 500,000 gpd provided as irrigation water to the Stone Tree Golf Course in Novato (Novato SD, 2017).

Solid Waste Processing and Disposal Facilities. Recology Sonoma-Marin is the franchise collector for the Novato area and provides recycling and greenwaste collection to residential and commercial accounts under the requirements of the California Integrated Waste Management Act (Novato SD, 2017).

Hazardous Waste Facilities. The Novato SD and Recology operate a permanent drop-off facility for household and small business hazardous waste at 7576 Redwood Boulevard in Novato (Novato SD, 2017).

Electricity. PG&E provides electricity to businesses and residences in the Novato area.

Sonoma County

The Petaluma, SVCSD, and SCWA service areas are located in Sonoma County. Their service areas include the City of Petaluma, City of Sonoma, and unincorporated Marin County. This discussion presents Sonoma County resources first, followed by that for the jurisdictions within which NBWRP Phase 2 elements would be located.

SVCSD, SCWA, and Petaluma: Unincorporated Sonoma County

Public Services

Police Protection. The Sonoma County Sheriff's Department headquartered at 2796 Ventura Avenue in Santa Rosa provides police protection to the unincorporated areas of the county, as well as the cities of Windsor and Sonoma. These law enforcement services are provided by the over 650 employees including Deputy Sheriffs in the Patrol Bureau, Investigations Bureau, Court Security and Transportation Bureaus. The Department has four substations and two detention facilities (Sonoma County, 2017c).

Fire Prevention and Protection. Fire protection services in the areas of Sonoma County which are part of NBWRP Phase 2 are provided by local agencies. Please see the discussion of each service area below.

Emergency Medical Services. Emergency medical services in the areas of Sonoma County which are part of NBWRP Phase 2 are provided by local agencies. Please see the discussion of each service area below.

Medical Facilities. Medical facilities in the areas of Sonoma County which are part of NBWRP Phase 2 are provided by service area below.

Schools. Schools located in the areas of Sonoma County affected by NBWRP Phase 2 are provided by service area below.

Libraries. The Sonoma County library is headquartered at Third and E Streets in Santa Rosa and has 13 branch locations throughout the county. The library branches closest to the NBWRP Phase 2 elements are discussed below.

Utilities

Please refer to the discussion of the Petaluma and SCVSD/SCWA service areas below for a discussion of sanitary sewer, solid waste, and electricity services specific to those areas.

Water. Potable, commercial, industrial and agricultural water supplies in Sonoma County are derived from a number of sources, including surface water (most of which is provided by SCWA), groundwater, and recycled water. Surface water sources are primarily used in the incorporated areas (cities) and are supplemented by groundwater. Residences in rural areas in the county tend to rely more on groundwater sources.

Hazardous Waste Facilities. The Sonoma County Department of Emergency Services, Hazardous Materials (Haz Mat) Division is responsible for the enforcement of the regulatory-based Hazardous Materials Programs in the county.

Petaluma: City of Petaluma

Public Services

Police Protection. The City of Petaluma's Police Department, headquartered at 969 Petaluma Boulevard North serves a population of over 60,000 residents encompassing a nearly 14-square-mile area. The department has a staff of 94 full-time employees, including one chief, five lieutenants, 10 sergeants, 52 officers, one community service officer, two parking enforcement officers, and other support staff (City of Petaluma, 2017a).

Fire Prevention and Protection. Petaluma Fire Department is headquartered at 198 'D' Street in downtown Petaluma. The department provides fire suppression, prevention, technical and disaster support, as well as emergency medical services to the community. All of the 45 firefighters on staff have emergency medical (EMT) certification and 21 are firefighter/ paramedics (City of Petaluma, 2017b).

Emergency Medical Services. Emergency medical services are provided in Petaluma by the Petaluma Fire Department (see above).

Medical Facilities. Petaluma Valley Hospital, located at 400 N. McDowell Blvd. receives 80 percent of emergency patient transports through the Petaluma Fire Department's ambulance service.

Schools. The Petaluma City Schools provides education for nearly 7,500 students including eight elementary campuses and 10 secondary schools. Old Adobe and Waugh School Districts serve some of the unincorporated areas of Petaluma near the proposed action. The schools closest to the project area are Bernard Eldridge, La Tercera, McDowell, McKinley, Miwok Valley, Old Adobe, and Petaluma Accelerated Charter School. Secondary schools closest to the proposed action area include Casa Grande and Sonoma Mountain High School.

Libraries. The Petaluma Regional Library branch is one of the largest in the Sonoma County Library system and is located at 100 Fairgrounds Drive in Petaluma. Also located near the project area is the Petaluma Historical Library located at 20 Fourth Street, Petaluma. This community resource provides readings, walking tours, historical exhibits, and an online catalogue (Petaluma, 2017).

Utilities

Water. The SCWA provides 90 percent of the drinking water for use in the Petaluma area, mainly sourced from wells in the Santa Rosa Plain and from the Russian River. Additional drinking water comes from local groundwater resources through private wells. The city has 10 storage reservoirs and seven pumping stations to distribute potable water.

Sewer. Petaluma's wastewater utility maintains a collection system for domestic, industrial and commercial wastewater generated in the city and the neighboring Penngrove area in unincorporated Sonoma County. Collected wastewater is conveyed for treatment to the Ellis Creek Water Recycling Facility (WRF) which currently processes approximately 5 million gpd or 1,500 million gallons annually, producing 708 million gallons of recycled water per year for numerous beneficial uses. End uses for this water include environmental habitat enhancement, parks and other landscape irrigation, agricultural, and fire protection, among others (City of Petaluma, 2017c). NBWRP Phase 2 includes a proposed 2.12 mgd capacity increase at the Ellis Creek WRF to expand such uses as well as an expansion of urban and agricultural recycled water distribution systems.

Solid Waste Processing and Disposal Facilities. Refuse, recycling, and yard waste collection services within the City of Petaluma are provided by the local franchisee, Petaluma Refuse and Recycling. In March of 2018 Recology will assume operations for these services (Recology, 2018). The Central Disposal Site, located at 500 Meacham Road north of Petaluma is the nearest waste processing and disposal facility to the Proposed Action in Petaluma. This facility also provides hazardous waste management services for households and area businesses (Sonoma County, 2017d).

Hazardous Waste Facilities. SCWMA comprises nine cities within Sonoma County and the County of Sonoma. It provides disposal of hazardous waste in the Sonoma area. The Central Disposal Site (500 Mecham Road) is the closest hazardous materials site to the Petaluma area (Sonoma County, 2017d).

Electricity. PG&E provides electricity to businesses and residences in the City of Petaluma.

SVCSD and SCWA: City of Sonoma

Public Services

Police Protection. In 2004, the City of Sonoma contracted with the Sonoma County Sheriff's Department to provide law enforcement services. The City of Sonoma Police Department, headquartered at 175 First Street in

Sonoma, and the Sonoma County Sheriff's Department headquartered in Santa Rosa, provide police protection in the area. The Department is staffed by a total of 16.5 full-time equivalent employees including one chief, two Sergeants, 10 patrol deputies, two Community Service Officers and 1.5 administrative positions. The stations serving the NBWRP Phase 2 area is the headquarters (175 First Street West) and the Sonoma Valley Sub-Station located at 810 Grove Street (City of Sonoma, 2017).

Fire Prevention and Protection. The Sonoma Valley Fire and Rescue Authority (SVFRA), headquartered at 630 2nd Street West in the City of Sonoma, provides fire protection and advanced life support medical services in the area. The SVFRA consists of a Fire Chief, four Division Chiefs, 11 Captains, 14 Engineers, 35 Part time Firefighters, 6 full-time EMS employees, 30 part-time EMS employees, four clerical staff, and approximately 30 volunteer firefighters (SVFRA, 2017). Many of the employees are Paramedic- trained. The stations closest to the project area are Station 1 (630 2nd Street West) and Station 2 (877 Center Street, El Verano).

Emergency Medical Services. Emergency medical services are provided in this area by the SVFRA (see above).

Medical Facilities. Medical facilities serving the area include the Sonoma Valley Hospital (347 Andrieux Street, Sonoma), Queen of the Valley Medical Center (1000 Trancas Street, Napa) and Santa Rosa Memorial Hospital (1165 Montgomery Drive, Santa Rosa); the latter two have trauma centers (SVFRA, 2017). The Sonoma Valley Hospital is a non-profit district hospital with a publicly elected five-member Board of Directors. This medical center provides emergency and urgent care as well non-emergency medical services (Sonoma Valley Hospital, 2017). The Queen of the Valley Medical Center and Santa Rosa Memorial Hospital are St. John Healthcare affiliates and offer emergency and non-emergency medical services (Queen of the Valley Hospital, 2017). The Santa Rosa Memorial Hospital is the designated trauma center for the NBWRP Phase 2 area (Santa Rosa Memorial, 2017).

Schools. The Sonoma Valley Unified School District oversees public schools in the project area. The elementary schools closest to the project area include Prestwood, Sassarini, Coleman, Laurel Dell, serving students in grades K-5, and El Verano serving K-8 students

Students in the Sonoma Valley Unified School District attend Adele Harrison Middle School (1150 Broadway) or Altimira Middle School (17805 Arnold Drive), which are both sixth through eighth grade schools. Students from Adele Harrison and Altimira continue to Sonoma Valley High (20000 Broadway) (Sonoma Valley Unified School District, 2017).

Libraries. The City of Sonoma is a member of the Sonoma County Library. The library location closest to the project area is the Sonoma Valley Regional Library, located at 755 West Napa Street in Sonoma (Sonoma County, 2017b).

Utilities

Water. Water services are provided by the Valley of the Moon Water District (VOMWD), Division 12, and the City of Sonoma. Both of the providers obtain water from SCWA via the Sonoma aqueduct. The VOMWD services approximately 7,200 acres and a population of 23,000. VOMWD purchases approximately 90 percent of its water from SCWA and the remaining 10 percent from municipal wells used primarily during the summer months. The City of Sonoma services the project area with water from SCWA and three municipal wells. The wells have a total pumping capacity of 1.1 million gpd, but because the water quality of the wells is significantly lower than that of SCWA, the wells are used only as a backup supply (SCWA, 2007).

Sewer. SCWA assumed management responsibilities for the County of Sonoma Sanitation Districts and Zones on January 1, 1995 from the County of Sonoma Department of Public Works. Area NBWRP Phase 2 elements are in the Sonoma Valley County Sanitation District (SVCSD), which provides wastewater treatment, reclamation and disposal. The SVCSD service area covers approximately 4,500 acres and includes approximately

118 miles of collection system pipelines. The SVCSD WWTP has an average dry weather flow of 2.6 million gpd (SCWA, 2017a).

Solid Waste Processing and Disposal Facilities. Sonoma Garbage Collectors provides recycling, garbage, and yard waste collection services in the City of Sonoma; Recology provides these services to the unincorporated area in Sonoma (Sonoma Garbage Collectors, 2018). The Sonoma Transfer Station (4376 Stage Gulch Road) serves as a local disposal facility for the Sonoma area.

Hazardous Waste Facilities. SCWMA comprises nine cities within Sonoma County and the County of Sonoma. It provides disposal of hazardous waste in the Sonoma area. The Sonoma Transfer Station (4376 Stage Gulch Rd.) is the closest hazardous materials disposal site (SCWMA, 2017).

Electricity. PG&E provides electricity to businesses and residences in the City of Sonoma.

Napa County

The Napa SD and American Canyon service areas are located in Napa County. Their service areas include the City of American Canyon, City of Napa, and unincorporated Napa County. This discussion presents Napa County resources first, followed by that for the jurisdictions within which NBWRP Phase 2 elements would be located.

American Canyon and Napa SD: Unincorporated Napa County

Public Services

Police Protection. The Napa County Sheriff's Department is headquartered at 1535 Airport Boulevard in Napa and provides police protection in the unincorporated areas of Napa, including in the Napa State Hospital storage and distribution proposed action areas and in the MST recycled water distribution areas. The department is responsible for primary law enforcement services in the unincorporated areas of Napa County and the cities of American Canyon and Yountville. These law enforcement services are provided by the over 135 Deputy Sheriffs in the Administrative, Patrol, Investigations, Civil and Coroner Divisions. The department has five regional offices. The station closest to the Soscol WRF is the department headquarters in Napa (Napa County, 2017).

Fire Prevention and Protection. The Napa County Fire Department contracts with the California Department of Forestry and Fire Protection (CAL FIRE) for fire protection services, including administrative coordination with nine volunteer fire departments operating under a County Fire Plan and supported by Napa County. The CDF Sonoma-Lake-Napa Unit Chief serves as the County's Fire Chief and is responsible for the direction and coordination of fire protection services by these agencies on a county-wide basis. The County also contracts with the cities of St. Helena and Calistoga, the Napa State Hospital, and Schell-Vista Fire Protection District for the provision of fire protection services to specified unincorporated areas adjoining these agencies. The department provides dispatching for the American Canyon Fire Protection District and Napa State Hospital Fire Department (Napa County, 2017).

Emergency Medical Services. The Napa County Fire Department and the American Canyon Fire Protection District provide emergency medical services in the area. The Department and District's trucks and engines are all emergency service equipped. The Department provides transportation to Queen of the Valley Medical Center (1000 Trancas Street, Napa) which has a trauma center (Napa County, 2017).

Medical Facilities. The closest medical facilities to the project area are Queen of the Valley Medical Center (1000 Trancas Street, Napa) and the Sonoma Valley Hospital (347 Andrieux Street, Sonoma). The Queen of the Valley Medical Center is a St. John Healthcare affiliate and offers emergency and non-emergency medical services (Queen of the Valley Hospital, 2008). The Sonoma Valley Hospital is a non-profit district hospital

with a publicly elected five-member Board of Directors. This medical center provides emergency and urgent care as well non-emergency medical services (Sonoma Valley Hospital, 2017).

Schools. The Napa Unified School District oversees public schools in the area. The schools closest to NBWRP Phase 2 elements include Mount George Elementary (1019 2nd Avenue) Silverado Middle School (1133 Coombsville Road), Wintun School (74 Wintun Court, off Imola Avenue), Alta Height Elementary (15 Montecito Boulevard), Carneros Elementary (1680 Los Carneros Avenue), Vichy Elementary (3261 Vichy Avenue) all of which have students in grades K-5 except Mount George Elementary which has students K- 8.

Students in the Napa school district attend Redwood Middle School (3600 Oxford Street), Harvest Middle School (2449 Old Sonoma Road), Silverado Middle School (1133 Coombsville Road), which are sixth- through eighth-grade schools located in the area. Students from Redwood, Harvest, and Silverado continue to Napa High School (2475 Jefferson Street), or Vintage High School (1375 Trower Street). There are also two alternative high schools Technology High School (920 Yount Street) and Valley Oaks High School (1600 Myrtle Avenue). Napa Valley Community College is also located in the City of Napa in Napa County (Napa Valley Unified School District, 2017).

Libraries. The Napa City-County Library System serves the unincorporated parts of Napa County and has branches in American Canyon, Napa, Calistoga, and Yountville. It is headquartered at 580 Coombs Street, Napa. The library location closest to the NBWRP Phase 2 elements in Napa County is the headquarters location (Napa County, 2017).

Utilities

Water. Groundwater is primary source of water in unincorporated Napa County. The largest source of groundwater in the area is the North Napa Valley Basin, Milliken-Sarco-Tulocay (MST) Subbasin. The Napa County Department of Public Works Water Division is responsible for the operation, maintenance, and improvement of the municipal water system serving the area around the Soscol WRF, which includes three treatment plants (Napa County, 2017).

Sewer. Napa SD, a NBWRP Phase 2 facility, provides wastewater collection, treatment and disposal services to the residents and businesses in the City of Napa and surrounding unincorporated areas of Napa County. Sanitary sewage is conveyed through a network of approximately 270 miles of underground sewer pipelines to the Soscol WRF, assisted by a system of six lift stations. The WRF is a secondary and tertiary biological physical-chemical treatment facility that treats a mixture of domestic and industrial wastewater. Napa SD has completed upgrades to the WRF, which include primary treatment, activated sludge facilities, and sludge digestion and solids de-watering facilities. It has a dry weather treatment design capacity of 15.4 million gpd (Napa SD, 2017).

Solid Waste Processing and Disposal Facilities. Napa Recycling & Waste Services/Napa County Recycling & Waste Services provides recycling, garbage, and yard waste collection services in the area.

Hazardous Waste Facilities. Napa-Vallejo Recycle and Reuse Facility and the Napa-Vallejo Household Hazardous Waste Facility provide hazardous waste disposal in the area. Both facilities are located on Highway 29 at Kelly Road. The Recycle and Reuse facility is open during regular business hours during the week, while the Household Hazardous Waste facility is open on Fridays, Saturdays, and Sundays from 9 AM to 3 PM. There is also an additional Permanent Collection Facility for Napa County located at 889A Devlin Road, American Canyon (Napa SD, 2017).

Electricity. PG&E provides electricity to businesses and residences in Napa County.

Napa SD: City of Napa

Please refer to the discussion of Napa County above for a discussion of sheriffs, medical facilities, schools, and libraries serving the NBWRP Phase 2 elements in unincorporated Napa County.

Public Services

Police Protection. The Napa Police Department, which is headquartered at 1539 First Street in Napa, provides police protection to the Napa SD Soscol proposed action area. The primary responsibility of the Napa Police Department is to work in partnership with the community to promote and maintain a peaceful, safe and secure environment. The department is organized within six bureaus: Administration, Patrol, Crime Prevention/Youth Services, Investigations, and Central Dispatch. Each bureau has a Police Commander in charge of its overall operation (City of Napa, 2018).

Fire Prevention and Protection. The Napa City Fire Department, headquartered at 1539 First Street in Napa, provides fire and first response medical care. The department works closely with CAL FIRE and the Napa County Fire Department, as well as maintains mutual aid agreements with those agencies plus the cities of American Canyon and Vallejo. The department has four fire stations covering 18 square miles within the city limits of Napa. Each station provides an Advanced Life Support (Paramedic) Engine company staffed with a minimum of three personnel. In addition, Fire Station One provides a Ladder Truck Company capable of specialized operations and heavy rescue. The department staffing consists of 62 public safety personnel, eight civilian employees, and 10 reserve personnel. The annual call volume is about 9,000 responses per year, of which 70 percent are medical in nature. The department participates in a multi-agency Hazardous Materials Response Team and maintains a Swift Water Rescue Team with two inflatable rescue boats. Station locations closest to the NBWRP Phase 2 elements are Station 4 (251 Gasser Ave) and Station 1 (930 Seminary Street) (City of Napa, 2016).

Emergency Medical Services. Emergency medical services are provided by the Napa City Fire Department (see above).

Utilities

Please refer to the discussion of Napa County above for a description of sanitary sewer, solid waste, and hazardous waste facilities serving the NBWRP Phase 2 elements in unincorporated Napa County.

Water. City of Napa's primary water source is surface water which is drawn from three sources: Lake Hennessey, Milliken Reservoir, and the State Water Project (SWP). The city's water rights to Lake Hennessey authorize it to divert and store up to 30,500 AF of water annually from Conn, Sage, and Chiles Creeks for beneficial use. Napa's water rights to Milliken Reservoir authorize the city to divert and store up to 2,350 AF of water annually from Milliken Creek, a tributary of the Napa River, for beneficial use. The City's Water Division (NWD) is responsible for providing a reliable supply of water safe for consumption and other domestic, industrial and commercial uses. The division's policy is to provide water on a demand-response basis and to plan for a water system that will meet the city's long-term growth needs.

Napa provides treatment of raw water at three water treatment plants (WTP): Hennessey, Milliken, and Jameson Canyon. The Hennessey WTP was constructed in 1981 and has a treatment capacity of 20 million gallons per day (MGD). The Milliken WTP was constructed in 1976 and has a treatment capacity of 4 MGD. The Jameson Canyon WTP was constructed in 1986 and has a treatment capacity of 12 MGD. The City of Napa is currently designing an expansion of the Jameson Canyon WTP to provide a maximum capacity of 24 MGD.

Electricity. PG&E provides electricity to businesses and residences in and around the City of Napa. The city is served from four electric substations: Tulocay Sub, south of Napa on Highway 221; Basalt Sub, south of Napa

on Highway 221 and north of Tulocay Sub; Napa Sub, 300 Burnall Street, near the Napa fairgrounds; and Pueblo Sub on Big Ranch Road, north of Napa.

American Canyon: City of American Canyon

Public Services

Police Protection. The City of American Canyon Police Department, headquartered at 911 Donaldson Way East, provides police protection to the area. The police department consists of 24 sworn officers, two police technicians, and an administrative clerk (City of American Canyon, 2017).

Fire Prevention, Protection, and Emergency Medical Services. The American Canyon Fire Protection District, headquartered at 911 Donaldson Way East, provides fire suppression, emergency medical and rescue services as well as public education on fire prevention to the community of American Canyon. The district also participates in the Napa Inter-agency hazardous incident and rescue teams (City of American Canyon, 2017).

Emergency Medical Services. The Napa County Fire Department and the American Canyon Fire Protection District provide emergency medical services in the project area. Each agency's trucks and engines are all emergency service equipped. The Department provides transportation to Queen of the Valley Medical Center (1000 Trancas Street, Napa) which has a trauma center (Napa County, 2017).

Medical Facilities. The closest medical facility to American Canyon is the Sutter Solano Medical Center, located at 300 Hospital Drive in Vallejo. The Queen of the Valley Medical Center is the regional trauma center serving the area.

Schools and Parks. The Napa Valley Unified School District oversees public schools in the American Canyon project area which include Napa Junction Elementary, Donaldson Way Elementary, Canyon Oaks Elementary, American Canyon Middle School, and American Canyon High School.

Libraries. The City of American Canyon has a Napa County public library branch located at 300 Crawford Way.

Utilities

Please refer to the discussion of Napa County above for a description of solid and hazardous waste facilities serving the NBWRP Phase 2 elements in unincorporated Napa County.

Water. The Water Treatment Division operates a water plant near Highway 12 at Jameson Canyon Road which provides water treatment through conventional sedimentation and filtration process as well as membrane filtration treatment. The City's primary water source is the State Water Project through the North Bay Aqueduct. During peak irrigation season, potable water supplies are supplemented as needed with treated water from the cities of Napa and Vallejo (City of American Canyon, 2017).

Sewer. The City of American Canyon Public Works Department operates it WRF, a NBWRP Phase 2 facility, to collect and treat domestic and industrial wastewater flows through a system of 53 miles of gravity pipelines, five pump stations, and 5 miles of sewer force mains. Pump stations convey sewer flows by gravity to the WRF located on the western edge of the service area near the Napa River. Wastewater is treated to Title 22 standards and is currently discharged to either the Napa River, via wetlands, or diverted to the City's recycled water distribution system (City of American Canyon, 2016).

Electricity. Pacific Gas and Electric Company (PG&E) provides electricity to businesses and residences in the City of American Canyon.

3.13.2 Regulatory Framework

Federal

No federal laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of NBWRP Phase 2 or alternatives to public services or utilities.

State

No state laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of NBWRP Phase 2 or alternatives to public services or utilities.

Local

MMWD and Novato SD Service Areas

Marin County

The Marin Countywide Plan contains the following goals and policies that are applicable to the proposed action as it relates to public services and utilities:

Goal PFS-1: Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns and the county.

***PFS-1.4: Reduce Demand on Public Facilities*.** Reduce per capita and total demand for water and wastewater treatment, and enhance storm water management through integrated and cost-effective design, technology, and demand reduction standards for new development and redevelopment.

Goal PFS-2: Sustainable Water Resources. Assure a reliable, sustainable water supply for existing and future development while protecting the natural environment.

Goal PFS-3: Reduction, Safe Processing, and Reuse of Wastewater. Continue to enhance the Alternative Onsite Wastewater Monitoring Program. This program ensures the proper operation of alternative and innovative wastewater system designs. Continue to work with manufacturers, designers, installers, end users, and the Regional Water Quality Control Board to evaluate the effectiveness and capabilities of these alternatives to traditional septic system designs. Work with stakeholders to periodically update design guidelines and regulations in the light of evolving best practices.

City of San Rafael General Plan

The General Plan for the city of San Rafael contains the following goals related to public services and utilities:

S-26: Fire and Police Services. Maintain adequate cost-effective fire protection, paramedic and police services. Minimize increases in service needs from new development through continued fire prevention and community policing programs.

S-28: Paramedic Services. Continue to seek adequate and cost-effective ways to provide accessible and reasonable emergency medical services.

Novato General Plan

Goal SH 1: Maintain high levels of public safety and emergency preparation.

Goal SH 6: Police and Community Safety. Provide a high level of service to the community by working to reduce crime and improve the safety of the community.

SVCSD, SCWA, and Petaluma Service Areas

Sonoma County

The Public Facilities and Services Element of the Sonoma County General Plan 2020 includes the following goals and objectives for maintaining utilities:

Goal PF-1: Assure that water and wastewater services are available where necessary to serve planned growth and development without promoting unplanned growth.

***Objective PF-1.1*:** Operate County water and wastewater facilities in accordance with planned growth and in compliance with applicable State and Federal standards.

***Objective PF-1.2*:** Help resolve water problems resulting from proliferation of small water systems.

Goal PF-2: Assure that park and recreation, public education, fire suppression and emergency medical, and solid waste services, and public utility sites are available to the meet future needs of Sonoma County residents.

***Objective PF-2.9*:** Use the Countywide Integrated Waste Management Plan, and any subsequent amendments thereto, as the policy document for solid waste management in the County.

***Objective PF-2.10*:** Locate and design public utility transmission, distribution, and maintenance facilities to minimize adverse effects on natural and scenic resources.

City of Sonoma

The Public Safety Element of the city of Sonoma's 2006-2020 General Plan contains the following goals related to public services and utilities:

Goal PS-2: Assure that essential emergency and public services will function effectively in a disaster.

Goal PS-3 1.4: Coordinate and maximize emergency medical service and firefighting capabilities in the city and Sonoma Valley.

Goal PS-3 2.3: Coordinate emergency planning with appropriate jurisdictions, agencies, and groups.

City of Petaluma

The City of Petaluma's General Plan 2025 contains the following goals and policies pertaining to public services and utilities:

Goal 7-G-1: Public Facilities and Services. Ensure adequate public facilities and services exist and are maintained to meet the needs of the community for an array of high quality services and programs.

***7-P-1*:** Coordinate with other agencies, such as the Sonoma County Library, to ensure that facilities plans are implemented in concert with City plans to best meet the facilities needs of the community.

***7-P-4*:** Assist other local and regional public and nonprofit agencies and service providers in locating facilities and resources needed to maintain, improve, and expand community services and programs that address specific needs in the Petaluma community.

***7-P-5*:** Upgrade and expand public facilities such as the Fire and Police stations, the satellite corporation yards and Animal Shelter to effectively and efficiently meet future needs of the community residents and the animals.

Goal 7-G-4: Schools, Education and Childcare Support efforts to provide superior educational opportunities for children and all members of the community.

Goal 7-G-5: Fire Protection Protect lives, property, and the environment by providing the highest quality of service in prevention, fire protection, emergency medical services, and community preparedness.

***7-P-17*:** Achieve and maintain a minimum ratio of one fire suppression personnel per 1,000 population served or a similar level of response service to meet increased call volumes.

Goal 7-G-6: Police Services. Provide police services that are responsive to citizens' needs to ensure a safe and secure environment for people and property in the community.

Goal 7-G-7: Hospitals and Health Care Facilities. Recognize the importance of maintaining, and expanding, Health Care Facilities serving the community.

Goal 8-G-1: Water Supply and Demand. Provide a safe, reliable, high-quality, economical and sustainable source of water to meet the community's needs.

Goal 6-G-1: Parks and Recreation. Retain and expand city-wide park and recreation assets and programs to maintain the quality of life they provide to the community.

Napa SD and American Canyon Service Areas

Napa County

Napa County's General Plan contains the following goals and policies pertaining to public services and utilities:

***Policy SAF-21*:** Achieving desired levels of fire protection in Napa County is directly related to the community's values and its participation, as well as available financial resources.

***Policy SAF-40*:** The County will seek to maintain the structural and operational integrity of essential public services during the event of flooding and other natural disaster, including the possible location, when feasible, of new essential public facilities outside of flood hazard zones. All critical public infrastructure intended for emergency use shall be provided with a source of alternate power.

***Policy SAF-44*:** Encourage local governments to develop search and rescue programs, emergency communication systems, and emergency services and facilities programs.

City of American Canyon

Goal 6A: Maintain a high level of fire protection and emergency services to City/District businesses and residences.

Goal 6B: Ensure a high level of police protection for the City's residents, businesses and visitors.

City of Napa

Goal CS-1: To ensure the timely development of public facilities and the maintenance of adequate service levels for these facilities to meet the needs of existing and future city residents.

Goal CS-2: To ensure community order and public safety in Napa.

Goal CS-3: To maintain an adequate police force to ensure a safe and secure community

Goal CS-4: To reduce and prevent crime through the use of community-oriented education and involvement programs.

Goal CS- 5: To provide emergency fire suppression services to protect life and property within the City.

Goal CS-6: To prevent and maintain safe neighborhood conditions through the use of community-oriented educational and involvement programs.

Goal CS-7: To provide emergency medical services adequate to meet the call demands within the city.

Goal CS-8: To provide for the educational needs of all Napa residents.

Goal CS-9: To ensure adequate, reliable, and safe water supplies to the community, even though drought periods of similar intensity as the 1986-1992 drought.

Goal CS-10: To ensure adequate wastewater collection and treatment and the safe disposal of wastes.

Goal CS-11: To develop and maintain a safe, attractive and environmentally sensitive drainage system for handling runoff due to seasonal rainstorms.

Goal CS-12: To provide for safe and environmentally sound municipal waste reduction and recycling programs that will allow the City to attain the requirements of AB 939.

APPENDIX 3.13B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to public services and utilities.

POTENTIAL IMPACTS AND SIGNIFICANCE – PUBLIC SERVICES AND UTILITIES

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.13.1: Temporary effect on response times for emergency service providers.							
Proposed Action	LSM	LS	LSM	LSM	LS	LSM	LS
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative:	(a)	LSM	LS	LS	(a)	(a)	LSM
Impact 3.13.2: Short-term police and fire assistance in traffic management.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LS
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative:	(a)	LSM	LS	LS	(a)	(a)	LSM
Impact 3.13.3: Temporarily, planned or accidental disruption to utility services.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LS
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative:	(a)	LS	LS	LS	(a)	(a)	LSM

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.14

Cultural Resources and Tribal Cultural Resources

3.14A. Setting and Regulatory Framework

3.14B. Impact Summary by Service Area

APPENDIX 3.14A
Setting and Regulatory Framework

3.14.1 Affected Environment

Records Search and Survey Results

Archaeological Resources

Results of the records search indicate that eight prehistoric archaeological resources, one historic-era archaeological resources, and two resources with both prehistoric and historic-era components have been previously recorded within a ¼-mile radius of the proposed Action. The 2010 Caltrans Historic Bridge Inventory was reviewed and no bridges inventoried or listed in the National Register are in the proposed Action area. A description of these resources, the results of the current survey effort, and a geological analysis for each service area are provided below. No cultural resources have been identified in the APE. Subsurface identification efforts have been completed or are in progress to further determine site boundaries.

Novato SD

Novato SD Recycled Water Facility. There are no previously recorded prehistoric or historic-era archaeological resources in the Novato SD Recycled Water Facility (RWF) or within a ¼-mile radius. Archaeologists from William Self Associates surveyed the Novato SD WWTP site in September 2004 and no archaeological resources were identified (William Self, 2004).

Geologic maps indicate the Novato SD WWTP (including the RWF) was constructed on artificial fill over San Francisco Bay Mud. In general, Holocene-age San Francisco Bay Mud deposits would not contain buried archaeological resources because they were formed in an environment that was submerged or exposed to regular tidal influence. San Francisco Bay Mud is therefore considered to have a low potential for containing buried sites with the exception of the interface of the San Francisco Bay Mud with the adjacent land surface, which is considered to have at least a moderate potential for buried sites (Meyer and Rosenthal in Byrd and Darcangelo, 2008:37). Given the WWTP's position adjacent to the existing marshland, the Novato SD RWF has a low to moderate archaeological sensitivity. However, because the WWTP site is highly disturbed from its original construction and the Project would require minimal construction in undisturbed areas, the archaeological sensitivity of the Novato SD RWF APE is considered low.

Distribution Pipelines. There are two prehistoric archaeological resources previously recorded within a ¼-mile radius of the Novato SD distribution pipelines. One resource (CA-MRN-174) consists of a small area of shell midden (Nelson, 1909). The other resource (CA-MRN-416) is a potential petroglyph on a small rock outcrop (Miller, 1974). The resources are not within the proposed Novato SD distribution pipeline APE. No archaeological resources were identified in the proposed Novato SD distribution pipeline APE.

The underlying geology of the Novato SD distribution pipelines consists of artificial fill and San Francisco Bay Mud. As discussed above, this geologic context has a low potential contain paleosols with buried archaeological resources. In addition, the proposed pipeline would be installed within artificially-constructed levees and there would be no ground disturbance to native soils. Therefore, the archaeological sensitivity of the Novato SD distribution pipelines APE is considered low.

SVCSD

Distribution Pipelines. There are no prehistoric archaeological resources previously recorded within a ¼-mile radius of the SVCSD distribution pipelines. There is one historic-era resource previously recorded within a ¼-mile radius of the SVCSD distribution pipeline APE. This resource (CA-SON-2288H) is a historic-era ranch complex and artifact concentration (Clark and Hoods, 1999). The resource is not within the proposed SVCSD distribution pipeline APE and would not be impacted by the proposed Action. No archaeological resources were identified in the proposed SVCSD distribution pipeline APE during the current survey effort.

The underlying geology of the SVCSD distribution pipeline APE is predominantly Pleistocene-age alluvial deposits, which does not have the potential to contain buried paleosols or related archaeological resources, though there is a band of Holocene-age alluvium associated with the Arroyo Seco flood deposits. Holocene-age alluvium, especially in the vicinity of a natural stream channel, has a high potential for buried paleosols and related archaeological resources. Therefore, the SVCSD distribution pipelines APE near Arroyo Seco on Napa Road is considered archaeologically sensitive (see **Figure 3.14-1**, **Appendix A**).

MMWD

Central Marin Sanitation Agency Treatment Facility. There are two prehistoric archaeological resources previously recorded within a ¼-mile radius of the CMSA Treatment Facility. These resources (CA-MRN-603 and an unnumbered site noted in Study-16949) consist of small areas of shell midden (Peak, 1982; Roop, 1991). The resources are not within the immediate CMSA Treatment Facility APE. No archaeological resources were identified in the CMSA Treatment Facility APE during the current survey effort.

Sediments at the CMSA Treatment Facility are highly disturbed from the Facility's original construction. The Facility was cut into the adjacent bedrock slope and excavation up to 12 feet deep was done for installation of the underground Facility components. There is a low potential to encounter buried paleosols and related archaeological resources in these contexts, therefore the archaeological sensitivity of the CMSA Treatment Facility APE is considered low.

Distribution Pipelines. There is one prehistoric archaeological resource previously recorded within a ¼-mile radius of the MMWD distribution pipelines. This resource (CA-MRN-79) is a small area of shell midden (Nelson, 1909). The resource is not within the proposed MMWD distribution pipeline APE and would not be impacted by the proposed Action. No archaeological resources were identified during the current survey effort in the proposed MMWD distribution pipeline APE.

The MMWD distribution pipelines would be installed in areas mapped primarily as bedrock, which does not have the potential to contain buried paleosols and related archaeological resources. The road right-of-way along Andersen Drive and Sir Francis Drake Boulevard is highly disturbed from grading and filling to construct the road into a relatively steep hillslope. Within San Quentin Prison, the pipelines would be installed within artificial fill and artificial fill over San Francisco Bay Mud. As discussed above, these geologic units have a low potential to contain paleosols and related archaeological resources. In addition, excavation would not extend below the artificial fill/San Francisco Bay Mud units to the interface with lower geologic units. The archaeological sensitivity of the MMWD distribution pipeline APE is, therefore, considered low.

Napa SD

Soscol Water Recycling Facility. In the vicinity of the proposed operational storage pond at the Soscol Water Recycling Facility (WRF) is site CA-NAP-860/H (also designated P-28-000001), a resource that includes both prehistoric and historic-era archaeological components, as well as historic-era architectural components. The resource was first identified in 1983 and consists of a historic-era ranch complex and a prehistoric midden deposit (Flynn, 1983; Thompson, 1994; Tinsley, 2005). The ranch complex included a two-story Colonial Revival-style farmhouse constructed in 1911 and associated structures, including a worker's cabin, an ornamental fountain, and a Quonset hut. A historic-era archaeological component associated with the ranch

complex was identified as a refuse scatter that included glass and ceramic fragments and saw-cut bone. Bartoy et al. (2005) recommended the Somky House as eligible for the California Register of Historical Resources (California Register). The building was moved in 2006.

The prehistoric component of CA-NAP-860/H consists of a moderate to dense concentration of obsidian debitage and midden soil. Several obsidian tools and an abalone pendant have also been identified. The site was formally recorded during a cultural resources survey completed prior to installation of the Napa Carneros Pipeline. In a subsequent recording that included subsurface survey to define the site boundaries, Bartoy et al. (2005) recommended that the prehistoric component of CA-NAP-860/H is potentially eligible for listing in the California Register. For the purposes of this Project, ESA assumes that the site is also potentially eligible for listing in the National Register.

ESA archaeologists conducted a surface survey and an archaeological subsurface survey to determine whether site constituents extend into the Phase 2 APE. On November 21, 2017, 10 samples were excavated along the western boundary of the site using a 10 cm (4-inch) hand auger. Soils were screened through a 0.6-cm (1/4-inch) mesh screen. Samples were excavated to 25–40 cm (10–16 inches) below ground surface. Soil consisted of a dark brown silty clay with small angular gravels consistent with alluvial deposits. Two samples each uncovered one small fragment (less than 1 cm) of obsidian debitage. No midden soil or other site constituents such as faunal or shell fragments were identified.

On December 15, 2017, ESA conducted additional samples to further determine whether site constituents extend into the Phase 2 APE. Fourteen core samples were excavated, again using a 4-inch (10 cm) hand auger. Soils were screened through a 0.6-cm (1/4-inch) mesh screen and samples were excavated to a depth of 50 cm (20 inches). Similar medium to dark brown silty clay with angular gravels was evident to approximately 40 cm (16 inches) below surface. Dense clay was present beneath the alluvial sediments. Of the fourteen samples, six each uncovered one small obsidian flake (less than 1 cm). No midden soil or other site constituents such as faunal or shell fragments were identified.

Due to the small recovery of obsidian debitage, ESA, in agreement with the Bureau of Reclamation archaeologist, completed additional subsurface survey in order to more definitively conclude whether archaeological materials that contribute to the significance of CA-NAP-860/H are in the APE or if the small amount of obsidian debitage uncovered in the samples are secondary deposits that do not contribute to the site's significance. ESA complete the subsurface survey in consultation with the Yoche Dehe Wintun Nation and in accordance with the methods outlined in the Proposed Cultural Resources Subsurface Survey (ESA, 2018).

Additional subsurface survey was accomplished by excavating 10 mechanical backhoe trenches. Trenches were approximately 1 meter (3 feet) wide, up to 2 meters (6 feet) long, and at least 1.5 meters (5 feet) deep. The depth of the trenches varied based on soil conditions and the results of adjacent trenches. Soil was excavated in 30-cm (1-foot) increments and stockpiled on the surface in separate piles. Sample buckets of soil from each pile was screened through a 0.6-cm (1/4-inch) mesh screen. Test trenching revealed the area is underlain by 0–2 feet of very dark brown to black sandy clay with silt, likely representing the historic plow zone. The plow zone overlies 2–4 feet of dark yellowish brown to dark greyish brown clay with silt, sand, and gravels, representative of younger Quaternary alluvial fan deposits. A thick layer of massive, yellowish brown hard silt with trace sand observed below the alluvial fan deposits likely corresponds to the "hardpan" identified by Kunkel and Upson (1960) as Pleistocene alluvial plain soils. Only three small obsidian flakes were recovered during the screening, all exclusively from within the upper 2 feet of the soil profile. As no midden soil or substantial quantities of obsidian or other artifacts were recovered ESA has determined that the known site is not within the Phase 2 APE. However, despite the negative results of the surface and subsurface surveys, the proposed location for the operational storage pond is considered to have a high archaeological sensitivity.

City of Petaluma

Ellis Creek Water Recycling Facility. There are no prehistoric sites or historic-era archaeological resources previously recorded in or within a ¼-mile radius of the Ellis Creek WRF. No archaeological resources were identified during the current survey effort in the Ellis Creek WRF APE.

The Ellis Creek WRF is mapped as artificial fill over San Francisco Bay Mud, which is considered to have a low potential to contain paleosols and related archaeological resources. The Project would utilize existing facilities to increase recycled water supply and would require minimal construction in undisturbed areas. The archaeological sensitivity of the Ellis Creek WRF APE is considered low.

Urban Distribution Pipelines. There is one multicomponent resource with archaeological and architectural components previously recorded within a ¼-mile radius of the City of Petaluma urban distribution pipelines. The resource (CA-SON-1248/H) was recorded on both banks of Lynch Creek (Roscoe, 1979). At the time of recording, the resource consisted of a historic-era farm complex dating to the 1890s (located on both sides of Lynch Creek) and a prehistoric archaeological site (located on the southeast side of Lynch Creek). The prehistoric component consisted of bowl mortar and groundstone fragments, chert scrapers, lithic debitage and cores, and fire-cracked rock. The historic-era farm complex was demolished and a park exists at that location. A housing development has been constructed at the location of the prehistoric component. No archaeological resources were identified during the current survey effort within the proposed City of Petaluma urban distribution pipeline APE.

The majority of the City of Petaluma urban distribution pipeline APE is within Holocene-age alluvial deposits associated with the flooding episodes of the Petaluma River and its tributaries. This geologic context has a generally high potential for buried paleosols and associated archaeological resources. The APE nearest to historic waterways has a heightened archaeological sensitivity (see **Figure 3.14-1, Appendix A**). These locations in the City of Petaluma urban distribution pipeline APE are considered to have a high archaeological sensitivity.

Agricultural Distribution Pipelines. There are three prehistoric archaeological sites previously recorded within a ¼-mile radius of the City of Petaluma agricultural distribution pipelines. The resources (CA-SON-198, CA-SON-199, and CA-SON-200) are all prehistoric shell middens recorded by N.C. Nelson during his 1907–1908 survey of the San Francisco Bay Area (Nelson, 1909). No archaeological resources were identified during the current survey effort in the City of Petaluma agricultural distribution pipeline APE. A subsurface survey consisting of excavating shovel test pits was completed in the vicinity of one of the previously recorded sites (CA-SON-198) to determine whether the site constituents extended into the APE. No archaeological materials such as midden soil, shell, animal bone, or artifacts were identified during the subsurface survey. In addition, the road right-of-way nearest to the known site had been graded approximately 2–4 feet below the surface thereby destroying the native surface. In the vicinity of the other two previously recorded sites, the road is engineered up to 10 feet with artificial fills. The pipeline would be installed almost entirely within artificial fill and, therefore, would not impact native soils. No additional archaeological resources were identified in the proposed City of Petaluma agricultural distribution pipeline APE.

The City of Petaluma agricultural distribution pipelines cross areas of Holocene-age alluvial deposits, San Francisco Bay Mud (adjacent to the historic shoreline), and bedrock. Holocene-age alluvial deposits and San Francisco Bay Mud adjacent to the historic shoreline have a high potential to contain paleosols and related archaeological resources. General archaeological sensitivity is also suggested by the several previously identified archaeological sites in the vicinity. However, much of Lakeville Highway has been significantly elevated above the surrounding marshland, in some places up to 12 feet above the original ground surface. In those locations, the proposed pipeline excavation would not extend into the natural ground surface and the potential to encounter paleosols and related archaeological resources is low. Conversely, the City of Petaluma agricultural distribution pipeline APE extending through Holocene-age alluvial deposits near historic waterways and in areas not previously disturbed or enhanced is considered to have a high archaeological sensitivity (see **Figure 3.14-1, Appendix A**).

City of American Canyon

Distribution Pipelines. There are no prehistoric or historic-era archaeological resources previously recorded in or within a ¼-mile radius of the City of American Canyon distribution pipelines. No archaeological resources were identified during the current survey effort in the City of American Canyon distribution pipeline APE.

The City of American Canyon distribution pipeline APE is located in areas mapped as Pleistocene alluvium. This geologic context has a low potential for paleosols and related archaeological resources. The archaeological sensitivity of the City of American Canyon distribution pipeline APE is, therefore, considered low.

Architectural Resources

There are five historic-era architectural resources previously recorded in or immediately adjacent to the NBWRP Phase 2 APE: two water treatment facilities, a railroad, a prison complex, and one historic-era bridge.

Novato SD

Two historic-era architectural resources are within or immediately adjacent to the Novato SD APE, the Novato SD Recycled Water Facility and the Northwestern Pacific Railroad.

The Novato SD WWTP (which includes the RWF) was built in several phases between 1949 and 2012, and the earliest extant building dates to 1967. The historic-age (45 years or older) buildings and basins do not meet any of the California and National Register criteria nor retain sufficient physical integrity (see Section 3.14.2 Regulatory Framework) and they are not considered eligible for listing in the California and National Registers (ESA, 2017a). The more recent buildings and structures do not appear to qualify as a historic property under criteria consideration g, for properties that have achieved significance within the past 50 years if it is of exceptional importance. No further consideration of the Novato SD RWF as a historical resource or a historic property is necessary for the Proposed Action.

The Northwestern Pacific Railroad was recorded as a historic-era resource during the Sonoma Marin Area Rail Transit Project (Garcia and Associates, 2004). Garcia and Associates recommended the railroad as not eligible for either the National or California Registers. The California State Historic Preservation Officer (SHPO) concurred with this recommendation in 2005 (OHP, 2008). It was further recommended that individual features or elements associated with the railroad, such as depots, trestles, bridges, signals, poles, etc., be evaluated individually for their California Register- and National Register-eligibility. No individual features or elements are located in the Novato SD APE.

Two bridges are in the Novato SD APE. The DeLong Avenue overcrossing was constructed in 1974 and is listed on the Caltrans Historic Bridge Inventory as a Category 5, indicating that it is not eligible for listing as in the California Register or National Register. The Rowland Boulevard bridge was constructed in the early 1990s and, therefore, does not meet the minimum age threshold (50 years or older) to be considered for listing in the California or National Registers.

SVCSD

One bridge extending over Arroyo Seco on Napa Road is adjacent to the SVCSD APE. The bridge is not listed in the Caltrans Historic Bridge Inventory. The bridge is a concrete slab cast-in-place bridge approximately 20 feet long and 45 feet wide with corrugated metal side railings. Based on the construction style and historic aerial imagery, the bridge appears to have been constructed in the 1920s. Similar bridges in the area have been listed as a Category 5 on the Caltrans Historic Bridge Inventory. The proposed pipeline would cross Arroyo Seco using jack and bore or directional drilling techniques and there would be no modification or impact to the bridge itself.

MMWD

One historic-era architectural resource (San Quentin State Prison) was identified just outside of the MMWD APE. The State of California purchased 20 acres of land at Point San Quentin in 1852 for a permanent prison and construction of the first cell block began that year. San Quentin State Prison is the oldest prison in California. The proposed Action would install underground pipeline and infrastructure to existing facilities on the San Quentin State Prison grounds and would not impact the buildings or structures that contribute to the prison complex. No modification to any of San Quentin State Prison built environment are proposed or anticipated.

NBWRP Phase 2 includes upgrades at the CMSA Treatment Facility. The CMSA Treatment Facility was constructed in 1985 and therefore does not meet the minimum age threshold (50 years or older) to be considered for listing.

Napa SD

One historic-era architectural resource (the Soscol WRF) is within the Napa SD APE. The oxidation ponds at the Soscol WRF were constructed in 1967. All other extant buildings and structures were constructed in multiple phases between 1978 and 2015 are not age-eligible (45 years or older) to be considered for listing in the California and National Registers. The more recent buildings and structures do not appear to qualify as a historic property under criteria consideration g, for properties that have achieved significance within the past 50 years if it is of exceptional importance. The oxidation ponds do not meet any of the significance criteria and are not considered eligible for listing in the California and National Registers (ESA, 2017b). No further consideration of the Soscol WRF as a historical resource or a historic property is necessary for the proposed Action.

City of Petaluma

There are no historic-era architectural resources within or adjacent to the City of Petaluma APE. The Ellis Creek WRF was constructed in 2007 and, therefore, does not meet the minimum age threshold to be considered for listing. Two bridges are in the City of Petaluma urban distribution pipeline APE, the Lynch Creek bridge on Maria Drive and the bridge on Telford Lane. The Lynch Creek bridge was constructed in the early 1980s. The Telford Lane bridge was constructed in the 1990s. Neither meets the minimum age threshold for consideration for listing in the California or National Registers.

City of American Canyon

There are no historic-era architectural resources within or adjacent to the City of American Canyon APE.

Cultural History

This section summarizes the cultural history of the northern San Francisco Bay Area. Because archaeological regions can represent large geographic areas and display some cultural homogeneity, a discussion of the environmental, prehistoric, ethnographic, and historic contexts is useful in order to evaluate the Project impacts to cultural resources in the NBWRP Phase 2 area.

Environmental Context

The NBWRP Phase 2 Project area is within the Central Coast, San Francisco Bay Area, and Outer North Coast Ranges sub-regions of the California Floristic Province. In general, this region is characterized by mosaics of upland oak and mixed evergreen forests, native and non-native grasslands, chaparral, upland scrub communities, marsh and wetland communities, and riparian scrubs, woodlands and forests. These subregions experience a Mediterranean climate, with most of the precipitation occurring in the winter and early spring months. The Central Coast subregion extends along the coast of the Pacific Ocean and San Francisco Bay.

Typical vegetation communities around the Bay are salt marches and coastal prairie. The San Francisco Bay Area subregion contains a diversity of plant community types. Compared to coastal California, the Outer North Coast Ranges sub-region has colder winters and hotter summers (Hickman, 1993).

Vegetation in the region is influenced by Mediterranean climate and coastal weather patterns and is characterized by redwood, mixed conifer, riparian and oak woodlands and forests, as well as native and non-native grassland and chaparral. Freshwater and alkali wetland and salt marsh communities are located along drainages and bay margins. Sloughs and brackish streams and wetlands are found along the western edges. Prior to Euroamerican settlement of the region, common marsh flora species would have included: tule rush, bull rush, cattails, sedges, other rushes, reeds, pondweed, knotweed, and yellow pond lily; and adjacent forest flora species would have included: willow, buttonbush, California sycamore, Fremont's cottonwood, Oregon ash, black walnut, box elder, valley oak, white alder, California buckeye, big leaf maple, elderberry, grape vine, blackberry, and poison oak. Large populations of tule elk, pronghorn, black-tailed deer would have been found in the vicinity prior to Euroamerican settlement. Other prominent terrestrial fauna in the area would have included: grizzly bear, puma, gray fox, bobcat, coyote, badger, spotted skunk, striped skunk, beaver, weasel, river otter, raccoon, ringtail, and cottontail rabbit. The main avian species in the area would have included: ducks, coot, cormorant, grebes, herons, cranes, egrets, gulls, geese, brants, swans, hawks, eagles, doves, quail, flicker, woodpeckers, owls, turkey vulture, and a number of passerines. Chinook salmon, white and green sturgeon, Pacific lamprey, steelhead rainbow trout, Sacramento sucker, western pike-minnow, sculpins, tule perch, pond turtle, freshwater mussel, and ridged mussel constitute the aquatic fauna that would have been present in the area. The arrival of Euroamericans to the area led to a dramatic decrease in the populations of the faunal species due to overhunting and habitat loss (CDFG, 2008; Holland, 1986; Sawyer and Keeler-Wolf, 1995).

The California coast has undergone dramatic landscape changes since humans began to inhabit the region more than 10,000 years ago, including both rising sea levels and increased sedimentation into streams and rivers. In many places, the interface between older land surfaces and Holocene-age landforms are marked by a well-developed buried soil profile, or a paleosol, which preserves the composition and character of the earth's surface prior to subsequent sediment deposition and thus have the potential to preserve archaeological resources (Meyer and Rosenthal, 2007). Because human populations have grown throughout the Holocene, archaeological sites are predicted to be more frequent in paleosols identified in Late Holocene contexts. Conversely, lower population levels during the early Holocene suggest a less likely occurrence of archaeological resources in older paleosols. Other criteria used to measure the archaeological sensitivity include proximity to perennial streams and lakes and the longevity of a landform on the surface. The alignment of these factors (i.e., a well-developed later-period buried landform in the vicinity of a perennial water source) does not necessarily indicate the presence of an associated archaeological resource, just an increased likelihood of the potential occurrence.

Based on the age of the APE's underlying geology and regional geoarchaeological analyses, there is the potential for the presence of Holocene-age buried prehistoric archaeological deposits in certain locations of the APE, including the SVCSD distribution pipelines and the City of Petaluma distribution pipelines. Nevertheless, no buried sites have been identified near the APE, nor has Meyer and Rosenthal's (2007) sensitivity analysis been assessed by site-specific subsurface testing. The geoarchaeological potential for each NBWRP Phase 2 area is discussed further, as applicable, above.

Prehistoric Context

Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. Milliken et al. (2007) provide a framework for interpreting the San Francisco Bay Area and have divided human history of the region into four periods: the *Paleoindian Period* (11,500 to 8000 B.C.), the *Early Period* (8000 to 500 B.C.), the *Middle Period* (500 B.C. to A.D. 1050), and the *Late Period* (A.D. 1050 to 1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns

into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* (11,500 to 8000 B.C.) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during the *Paleoindian Period* has not yet been discovered in the Bay Area.

During the *Early Period* (8000 to 3500 B.C.), also known as the *Lower Archaic*, geographic mobility continued from the *Paleoindian Period*. The period is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut-shell beads and the mortar and pestle are documented in burials during the *Early Period* (3500 to 500 B.C.), indicating the beginning of a shift to sedentism.

During the *Middle Period*, which includes the *Lower Middle Period* (500 B.C. to A.D. 430), and *Upper Middle Period* (A.D. 430 to 1050), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich midden sites are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the *Upper Middle Period*, highly mobile hunter-gatherers were increasingly settling down into numerous small villages. Around A.D. 430 a dramatic cultural disruption occurred as evidenced by the sudden collapse of the *Olivella* saucer-bead trade network.

The *Initial Late Period* (A.D. 1050 to 1550) is characterized by social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

Previous Archaeological Studies

Many of the original surveys of archaeological sites in the San Francisco Bay Area were conducted by N.C. Nelson of the University of California, Berkeley between 1906 and 1908. These surveys yielded the initial documentation of nearly 425 "earth mounds and shell heaps" along the coast from the Russian River in Sonoma County to Half Moon Bay in San Mateo County and along San Francisco Bay's shoreline (Nelson, 1909). From these beginnings, the most notable sites in the Bay Area excavated scientifically included the Emeryville shell mound (CA-ALA-309), the Ellis Landing Site (CA-CCO-295) in Richmond, and the Fernandez Site (CA-CCO-259) in Rodeo Valley (Moratto, 1984). These dense midden sites are vast accumulations of domestic debris and date back to over 2,000 years ago; the Emeryville shell mound, for example, is dated at approximately 2,310 years old ($^{\pm}$220 years).

While there have been no excavations on the north side of San Pablo Bay in Sonoma and Napa counties yielding dated components, a framework for the North Bay has been suggested using data from sites along Marin County's bay shoreline as well as locales further north in the Santa Rosa plain and the Sonoma and Napa valleys (Milliken et al., 2007:104, Figure 8.4). One of the earliest San Francisco Bay sites is CA-MRN-17, located on De Silva Island in Marin County. While the upper midden yielded Late Period materials, the 6-meter-deep deposits yielded a radiocarbon date of approximately 3430 B.C. and contained handstones and heat-affected chert (Breschini in Stewart and Praetzellis, 2003:115). Another early North Bay site is CA-SON-20, located east of Santa Rosa where the Spring Lake aspect of the Borax Lake pattern (6500 B.C. to 3500 B.C.) has been defined. Subsistence-based studies (Bennyhoff in Moratto, 1984:262) have been conducted using data from North Bay sites concluding a shift from oyster to mussel harvesting during the break between the Lower and Upper Middle periods (cal A.D. 430) and then a second shift to clam digging during the Late Upper Middle Period (cal A.D. 800). The shifts may reflect oyster overexploitation (Jones, 1991:4) and environmental factors (Story et al., 1966:48). During the Terminal Late Period, beginning around A.D. 1550, numerous new technologies and patterns appeared, first in the North Bay. These include the toggle harpoon, hopper mortar, corner-notched arrow-

sized projectile point, clamshell disk beads, magnesite tube beads, and secondary cremation. The shift may be due to one or many factors including population expansion or movements, as well as the spread of European-introduced epidemics north from Mexico (Milliken et al., 2007:118).

Ethnographic Setting

The Project area is located within the ethnographic territory of three distinct Native American tribes: Coast Miwok, Patwin, and Wappo, as discussed below.

Coast Miwok

The majority of the Project area, including the Novato SD, SVCSD, MMWD, and the City of Petaluma service areas, is located within the ethnographic territory of the Coast Miwok (Barrett, 1908; Kelly, 1978; Kroeber, 1925). The Coast Miwok language, a member of the Miwokan subfamily of the Penutian family, is divided into two dialects: Western, or Bodega, and Southern, or Marin, which in turn is subdivided into valley and coast. *Miwok* refers to the entire language family that was spoken by Coast Miwok, as well as Lake, Valley, and Sierra Miwok. Coast Miwok territory encompassed all of present-day Marin County and parts of Sonoma County, from Duncan's Point on the coast east to between the Sonoma and Napa Rivers. Each large village had a tribal leader but there does not appear to have been defined larger organization (Kelly, 1978:414).

Much of the information about post-contact Coast Miwok material cultural and lifestyles was gathered from two informants, Tom Smith (Bodega dialect) and María Copa (Marin dialect) (based on Kelly's field notes from 1931 to 1932; Kelly, 1978:424). Settlements focused on bays and estuaries, or along perennial interior watercourses. The economy was based on fishing, hunting, and gathering, revolving around a seasonal cycle during which people traveled throughout their territory to make use of resources as they became available. Marine foods, including kelp, clams, crabs, and especially fish, were a year-round staple. Acorns were gathered in season and stored for use throughout the year.

By the mid-1800s Spanish missionization, diseases, raids by Mexican slave traders, and dense immigrant settlement had disrupted Coast Miwok culture, dramatically reducing the population, and displacing the native people from their villages and land-based resources. By the time of California's initial integration into the United States in the late 1840s, the Coast Miwok population had dwindled to approximately250 individuals, one-eighth of its size before European contact (Kelly, 1978:414).

In 1920, the Bureau of Indian Affairs purchased a 15.45-acre tract of land in Graton for the Marshall, Bodega, Tomales, and Sebastopol Indians. This land was put into a federal trust and these neighboring peoples, that included both Coast Miwok and Southern Pomo, were consolidated into one recognized group called the Graton Rancheria. In 1958, the U.S. government enacted the Rancheria Act of 1958, transferring tribal property into private ownership; forty-four Rancherias in California were affected, including the Graton Rancheria.

Throughout the remaining century, tribal members continued to protect their cultural heritage and identity despite being essentially landless. On December 27, 2000, President Clinton signed into law the legislation restoring federal recognition to the Federated Indians of Graton Rancheria. The tribe currently has approximately 1,100 members.

Wappo

The northern Napa SD service area is situated within the ethnographic territory of the Wappo—a population of Yukian-speaking, hunter-gatherer people with their own unique dialect and language, who occupied the northern Napa Valley and portions of the north and eastern Russian River Valley, within the Santa Rosa Plain. Geographically, the territorial area occupied by the Wappo stretched in a northwesterly direction from just north of the present-day cities of Napa and Sonoma to include the cities of Geyser, Cloverdale and Middletown at its

northern extent (Barrett, 1908:264; Kroeber, 1925:218–219, Plate 27). This territory included the broad northwest-southeast trending river valleys and associated tributaries, as well as the flanking mountains of the Coastal Range and a small enclave along the southern shore of Clear Lake called *Lile'ek* by the Pomo, their neighbors to the west (Kroeber, 1925:219). Isolated from other Yukian-speaking peoples, this group was bound on all sides by other native groups: the Lake Miwok to the north, the Patwin (Wintun) to the south and east, the Pomo to the north and west, and the Coast Miwok to the southwest (Heizer and Whipple, 1971: Map 1).

The name *Wappo* is a version of the Spanish term "guapo" which means handsome or brave, a title given to this group during the time of the Missions as a result of their "stubborn resistance to the military adjuncts of the Franciscan establishments" (Kroeber, 1925:217). Stephen Powers recognized the original name for these peoples as *Ashochimi*, and noted that the use of the term "*Wappo* – The Unconquerable" by this population, in reference to itself, was common practice (Powers, 1877:196).

It is surmised that the population of the Wappo prior to European contact may have exceeded 1,000 persons before falling drastically to 40 persons in 1908. During Spanish occupation, the Wappo were notably resistant to all attempts of subjugation, from which they obtained their title. Despite this resistance, this native population was eventually brought under the control of the Mission at Sonoma, between 1823 and 1834. The remaining population was eventually moved to a reservation in Mendocino, where the majority perished, eventually leading to the closure of the reservation in 1867 (Kroeber, 1925:221; Sawyer, 1978:258–259).

Patwin

The City of American Canyon is within the ethnographic territory of the Patwin. The word "Patwin" is used to describe not a unified political group but a collection of tribelets whose territory centered on the southern portion of the Sacramento River Valley, from the town of Princeton on the north to the San Pablo and Suisun Bays on the south (Johnson, 1978:352). Neighboring tribes included Nisenan, Konkow, Nomlaki, Costanoan, Plains Miwok, and Pomo. Patwin tribelets traded among themselves and with these neighboring tribes, exchanging, among other things, bows, obsidian, shell beads, and otter pelts.

The Patwin were organized into autonomous tribelets, each consisting of a primary village and several satellite villages. Each village was headed by a hereditary chief (Johnson, 1978:354). Residence after marriage was matrilocal and the household was the basic social unit. The Patwin hunted, fished, and gathered salmon, waterfowl, deer and other mammals, seeds, and acorns being important food sources. Virtually unique to Northern Californian peoples, the Patwin practiced the Kuksu cult system, which featured a number of secret societies into which young men were initiated (Johnson, 1978:353).

Historic Background

This section presents a discussion of the historic period as it generally applies to the region, as well as an individual synopsis of major historical events within the respective modern-day California counties in which the Project area is located (i.e., Sonoma, Napa, and Marin counties).

Regional Overview

First European contact with the Northern California region has often been associated with the landing of Sir Francis Drake, at some point north of the Spanish claim of Point Loma in 1579 (Bancroft, 1886; Heizer, 1947). The precise location of this landing is not known, although it is often claimed that Drake entered and moored off Drakes Bay at Point Reyes. The next recorded European presence occurred when the Portolá expedition entered the area while in search of Point Reyes in 1769. Beginning in 1806, Russian presence increased, particularly to the northwest of the Project area, eventually culminating in the establishment of a permanent trading outpost for the Russian-American Company at Fort Ross in 1812. Spain controlled the Alta California territory, including the northern San Francisco Bay area, until the establishment of the independent government of Mexico in 1821. Francisco Castro and Father José Altamira in 1823 led a Spanish expedition to

the area in an effort to scout for potential Mission sites and as a result, the Mission at Sonoma (San Francisco-Solano Mission) was founded in that same year. The Mission cultivated herds of livestock and attempted to convert the local native population with little success. Secularization of Mission lands soon followed the transfer of control to the Mexican government, who in 1833 passed a law beginning a period of large, private land-ownership known as ranchos. It was intended that secularized Mission holdings be reverted to the Native Californian population that originally occupied the lands, however most of the territory became the holdings of Mexican and American industrialists. Following the end of the Mexican-American War in 1848, California was admitted to the Union in 1850, becoming the 31st state within the United States of America. Napa County, Sonoma County, and Marin County are among the 27 original California counties established in 1850 (Hoover et al., 2002).

Sonoma County

In 1775, prior to establishment of the Mission, Spanish contact with Sonoma County occurred when Lieutenant Juan Francisco de la Bodega y Quadra entered the aptly-named Bodega Bay (Anonymous, 1891). Sonoma County hosted Russian, Spanish, and other European settlers during the early historic-era, as well as a drastically impacted Native population; the county was within the territory originally controlled by the San Francisco-Solano Mission at Sonoma. With the transition from Spanish to Mexican control, the Mexican government established various military outposts within Alta California, one of which was the El Presidio de Sonoma (Sonoma Barracks), founded in 1836 to board troops under the direction of General Mariano Guadalupe Vallejo. This troop presence was strategically selected in an effort to counter Native American resistance as well as the slow decline of Russian control from the north. General Vallejo owned the large Rancho Petaluma and between 1834 and 1840 built the largest adobe in Northern California, the Petaluma Adobe, in the western foothills of the Sonoma Mountains. Vallejo also owned Rancho Água Caliente along Sonoma Creek adjacent to the town of Sonoma. In 1846, sparked by rumors of looming action by the Mexican government against settlers, a small group of recent Euroamerican immigrants hoisted a flag with a bear and a star in the town center of Sonoma. The "Bear Flag" symbolized the formation of a California Republic that was independent from Mexico. Rebels from this movement occupied the Sonoma Barracks adobe and captured General Vallejo. The independent California Republic was short-lived as war was declared between Mexico and America, with the majority of the "Bear Flaggers" shifting their support behind the American effort to bring California into the Union as a state.

As the American Period began in the late 1840s, the influx of new economies and the process of secularization resulted in an increase in settlement and the development of farming, ranching, and businesses in Sonoma County. It was in the mid-nineteenth century that wine grapes from Europe were first successfully grown. Since its formation, Sonoma County has been a center for viticulture, agriculture, shipping ventures, and larger commercial activities, which encouraged the formation of and prosperity of cities such as Sonoma, Petaluma, Santa Rosa, and Healdsburg (Hoover et al. 2002:503–516).

Napa County

With Alta California's independence from Spain and the beginning of Mexican control, the area of Napa County was subdivided into twelve ranchos: Humana Carne, Catacula, Caymus, Chimiles, Entre-Napa, Le Jota, Locoallomi, Napa, Tulucay, Yajome, Huichia, and Mallacomeato (Anonymous, 1891). The first non-Spanish American settler to the Napa Valley area was George C. Yount in 1831. Originally intending to travel to the Pacific Ocean to trap otter, Yount instead stopped early and worked as a carpenter for General Mariano Vallejo. In 1836, Yount received the 12,000-acre Rancho Caymus land grant, and in 1842 applied for and received the Rancho La Jota land grant on Howell Mountain.

With the discovery of gold in 1848 and the subsequent gold rush of the early 1850s, the population of California grew exponentially. As a previously established American-occupied area, Napa County drew in many of the miners disillusioned by the gold fields and the severe winter in the Sierra Nevada. Saw mills, timber harvesting, and cattle ranches provided employment within Napa Valley. Between 1840 and 1845 many emigrant American families settled in the Napa Valley area. It was in 1848 that Napa City was laid out by Nathan Coombs on property he acquired from Nicholas Higuera's Rancho Entre-Napa. The burgeoning

population helped build Napa City from a tent city along Main Street to the primary business and economic center for the Napa Valley it is today. By 1853 the first roads began to appear on Howell Mountain. Old Howell Mountain Road became the stagecoach route between the Napa Valley and Lake County. In the 1860s and 1870s small groups of settlers began planting vineyards in the Napa Valley area and today Napa County is best known for its world-renowned wine production (Hoover et al., 2002:242–250).

Marin County

The name for this county is purportedly derived from that of a famous Coast Miwok Lacatuit Chief, whose people originally occupied this northern San Francisco Bay territory (Goerke, 2007). Following the alleged arrival of Sir Francis Drake, Sebastião Rodrigues Soromenho anchored off the Coast of Marin County in 1595. A Portuguese explorer sailing for Spain, Soromenho was ordered to explore more of the coast of California and it was during this trip that his ship, the San Agustín, was shipwrecked at Drakes Bay. While his crew built a new vessel, Soromenho completed modest exploration of the Marin County area (Heizer, 1941). Sebastián Vizcaíno was the next explorer to drop anchor at Drake's Bay, when he arrived in 1603 (Chapman, 1920). Permanent settlement in Marin County was eventually achieved in 1817 when the Mission San Rafael was established by Padres Amaroso and Cijos (Anonymous, 1891). During the Mexican Period, the land within Marin County was divided into several ranchos.

As with many other counties in California, the Gold Rush inspired elevated migration of peoples and industry into Marin. Saw mills opened to take advantage of the numerous redwood stands in the region, as did paper mills. Cattle ranching, fisheries, and dairies sparked the eventual arrival of the North Pacific Railroad that greatly increased the Euroamerican population of the county. By the late 1850s several prominent Marin County cities were well established, including Sausalito, San Rafael, and Novato. In 1853 a state penitentiary was constructed at San Quentin which is still in use today (Hoover et al., 2002:182–196).

3.14.2 Regulatory Framework

Federal

Archaeological and architectural resources (buildings and structures) are considered through the National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470f), and its implementing regulations, codified at 36 Code of Federal Regulations (CFR) Part 800, the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979 (ARPA). Prior to implementing an "undertaking" (e.g., issuing a federal permit), Section 106 of the NHPA requires federal agencies (e.g., Bureau of Indian Affairs, Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Army Corps Of Engineers, etc.), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation and the SHPO a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing on the National Register. Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the National Register. Under the NHPA, a resource is significant if it meets the National Register listing criteria at 36 CFR Section 60.4, as stated below:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
>
> a) That are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> b) That are associated with the lives of persons significant in our past, or

c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

d) That have yielded, or may be likely to yield, information important in prehistory or history.

The American Indian Religious Freedom Act of 1978 allows access to sites of religious importance to Native Americans. On federal land, ARPA and the Native American Graves Protection and Repatriation Act (NAGPRA) would apply. ARPA assigns penalties for vandalism and the unauthorized collection of archaeological resources on federal land and provides for federal agencies to issue permits for scientific excavation by qualified archaeologists. NAGPRA assigns ownership of Native American graves found on federal land to their direct descendants or to a culturally affiliated tribe or organization and provides for repatriation of human remains and funerary items to appropriate Native American descendants.

Federal review of projects is normally referred to as the Section 106 process. The Section 106 review normally involves a four-step procedure described in detail in the implementing regulations (36 CFR Part 800):

1. identify and evaluate historic properties in consultation with the SHPO and interested parties;
2. assess the effects of the undertaking on properties that are eligible for inclusion in the National Register;
3. consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation; and
4. proceed with the project according to the conditions of the agreement.

State

The State of California coordinates a series of statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), is responsible for consulting on projects with a federal nexus under Section 106 of the NHPA on a statewide level. The OHP also maintains the CHRIS. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act

CEQA, as codified in Public Resources Code (PRC) Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed action would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological resource is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological resource does not meet the CEQA Guidelines criteria for a historical resource, then the resource may meet the threshold as a unique archaeological resources, as defined in PRC Section 21083. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC Section 21083.2 [g]).

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register, a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria.

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

2) Is associated with the lives of persons important in our past.

3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time must have passed to allow a "scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of the time needed to understand the historical importance of a resource.[1]

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

Assembly Bill 52

In September of 2014, the California Legislature passed Assembly Bill (AB) 52, which added provisions to the PRC, that included definition of a new resource type, tribal cultural resources, for consideration under CEQA. AB 52 outlines the process for evaluating proposed action impacts on tribal cultural resources and consultation

[1] In order to protect potential resources, the State of California Office of Historic Preservation recommends documenting, and taking into consideration in the planning process, any cultural resource that is 45 years or older (California Office of Historic Preservation, *Instructions for Recording Historical Resources*, March 1995).

requirements with California Native American tribes. In particular, AB 52 requires lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources (PRC Section 21074, 21083.09). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, 21082.3).

Specifically, PRC Section 21084.3 states:

a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.

b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

    1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

    2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

        (A) Protecting the cultural character and integrity of the resource.

        (B) Protecting the traditional use of the resource.

        (C) Protecting the confidentiality of the resource.

    3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

    4) Protecting the resource.

Finally, AB 52 required the Office of Planning and Research to update Appendix G of the CEQA Guidelines by July 1, 2016 to provide sample questions regarding impacts to tribal cultural resources (PRC Section 21083.09). AB 52 applies to those projects for which a lead agency has issued a Notice of Preparation (NOP) of an environmental impact report or notice of intent to adopt a negative declaration on or after July 1, 2015.

Local

In Marin County, Marin Countywide Plan, the City of San Rafael General Plan, and the City of Novato General Plan, contains policies intended to preserve cultural and historical resources.

Marin Countywide Plan

Goal HAR-1: Historical Resource Protection. Identify and protect archaeological and historical resources as major contributors to quality of life and community vitality in Marin.

Policy HAR-1.1: Preserve Historical and Archaeological Resources. Identify archaeological and historical resource sites.

Policy HAR-1.3: Avoid Impacts to Historical and Archaeological Resources. Ensure that human activity avoids damaging cultural resources, where feasible.

City of San Rafael General Plan

Goal 28: Protected Cultural Heritage. It is the goal for San Rafael to have protected and maintained historic buildings and archaeological resources as part of San Rafael's cultural heritage.

CA-15. Protection of Archaeological Resources. Recognize the importance of protecting significant archaeological resources by:

- Identifying, when possible, archaeological resources and potential impacts on such resources.
- Providing information and direction to property owners in order to make them aware of these resources.
- Implementing measures to preserve and protect archaeological resources.

CA-15a. Archeological Resources Ordinance.

Novato General Plan

Goal 1: Retain our Connections to our Past

***CC 1: Historic Buildings, Sites and Districts*.** Identify, recognize, and protect sites, buildings, structures and districts with significant cultural, aesthetic and social characteristics which are part of Novato's heritage.

***CC 1a: Historic Building Designations*.** Periodically, as necessary, review and consider revisions to the list of locally-designated historically significant resources, including consideration of modifying the boundaries of the Historic Preservation Overlay District.

CC 2: Archaeological Resources Protection. Recognize the importance of protecting significant archaeological resources and implement measure to preserve such resources.

Sonoma County General Plan

The Open Space and Resource Conservation Element of the Sonoma County General Plan contains the following goals and established mitigating policies relevant to historic and archaeological resources:

Goal OSRC-19: Protect and preserve significant archaeological and historical sites that represent the ethnic, cultural, and economic groups that have lived and worked in Sonoma County, including Native American populations. Preserve unique or historically significant heritage or landmark trees.

***Policy OSRC-19j*:** Develop an archaeological and paleontological resource protection program that provides:

(1) Guidelines for land uses and development on parcels identified as containing such resources,

(2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance, and

(3) Educational materials for the building industry and the general public on the identification and protection of such resources.

***Policy OSRC-19k*:** Refer applications for discretionary permits to the Northwest Information Center to determine if the project site might contain archaeological or historical resources. If a site is likely to have these resources, require a field survey and preparation of an archaeological report containing the results of the survey and include mitigation measures if needed.

***Policy OSRC-19l*:** If a project site is determined to contain Native American cultural resources, such as sacred sites, places, features, or objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites, notify and offer to consult with the tribe or tribes that have been identified as having cultural ties and affiliation with that geographic area.

***Policy OSRC-19n*:** Develop procedures for complying with the provisions of State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, if applicable, in the event of the discovery of a burial or suspected human bone. Develop procedures for consultation with the Most Likely Descendant as identified by the California Native American Heritage Commission, in the event that the remains are determined to be Native American.

City of Sonoma General Plan

Goal CD-5: Reinforce the historic, small-town characteristics that give Sonoma its unique sense of place.

***Policy 5.8*:** Encourage the designation and preservation of local historic structures and landmarks, and protect cultural resources.

Goal CD-6: Establish Sonoma as a cultural center.

Petaluma General Plan

Goal 3-G-1: Historic Preservation Identify, recognize and protect Petaluma's unique and irreplaceable cultural heritage through the implementation of policies and programs that maintain the character and identity of the community, enhance the quality of the built environment, encourage awareness and appreciation for its history and culture, and contribute to its economic vitality. Ensure that future plans, ordinances, and City programs are complimentary to the historic preservation goals and policies contained within this plan.

***3-P-1*:** Protect historic and archaeological resources for the aesthetic, cultural, educational, environmental, economic, and scientific contribution they make to maintaining and enhancing Petaluma's character, identity and quality of life.

J. Ensure the protection of known and unrecorded archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archeologically sensitive for Native American and/or historic remains.

K. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.

Napa County General Plan

In Napa County, the Napa County General Plan contains the following goals and policies relevant to cultural resources.

Goal CC-4: Identify and preserve Napa County's irreplaceable cultural and historic resources for present and future generations to appreciate and enjoy.

Policy CC-17: Significant cultural resources are sites that are listed in or eligible for listing in either the National Register of Historic Places or the California Register of Historic Resources due to their potential to yield new information regarding prehistoric or historic people and events or due to their intrinsic or traditional cultural value.

Policy CC-18: Significant historical resources are buildings, structures, districts, and cultural landscapes that are designated Napa County Landmarks or listed in or eligible for listing in either the National Register of Historic Places or the California Register of Historic Resources. Owner consent is a prerequisite for designation as a County Landmark.

Policy CC-19: The County supports the identification and preservation of resources from the County's historic and prehistoric periods.

The City of Napa General Plan

Goal HR-6 To preserve important archaeological resources.

***Policy HR-6.1*:** The City shall enforce current federal and state and procedures for identifying, preserving and protecting prehistoric sites.

***Policy HR-6.2*:** The City shall require investigation during the planning process for all proposed developments in archaeologically sensitive areas in order to determine whether prehistoric resources may be affected by the project and, if so, require that appropriate mitigation measures be incorporated into the project design.

***Policy HR-6.3*:** Recognizing that Native American burials or archaeological artifacts may be encountered at unexpected locations, the City shall continue to enforce state mandates with its current mitigation requirement, applied to all development permits and tentative subdivision maps, that upon discovery of remains during construction, all activity will cease until qualified professional archaeological examination and reburial in an appropriate manner is accomplished.

City of American Canyon General Plan

Goal 8E: To promote the preservation and restoration of the sites, structures and districts that have architectural, historical, archaeological and/or cultural significance to the City of American Canyon.

Objective 8.19 Ensure that the City's historically and archaeologically significant resources are protected in a manner that preserves and/or enhances the resources' inherent historic value.

Policy 8.19.3 Explore various methods for the future preservation of historic vegetation and archaeological and cultural resources. For example, consider establishing "receiver site" and "adopt a building" programs to preserve historic structures that must be removed from their sites. Additionally, consider utilizing the Secretary of the Interior Standards for Historic Rehabilitation and standards and guidelines prescribed by the State Office of Historic Preservation as the architectural and landscape design standards for rehabilitation, alteration, or additions to sites containing historic resources in order to preserve these structures in a manner consistent with the sites' architectural and historic integrity.

APPENDIX 3.14B
Impact Summary by Service Area

This table provides a summary of potential Project impacts related to cultural resources and Tribal cultural resources.

POTENTIAL IMPACTS AND SIGNIFICANCE – CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**SVCSD**	**SCWA**	**Napa SD**	**Petaluma**	**American Canyon**
Impact 3.14.1: Impacts or Adverse Effects to Archaeological Resources, Human Remains, and Tribal Cultural Resources.							
Proposed Action	LSM	LSM	LSM	LSM	SU	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.14.2: Impact to Architectural Resources.							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	NI	NI	(a)	(a)	NI

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.15
Recreation

3.15A. Regulatory Framework
3.15B. Impact Summary by Service Area

APPENDIX 3.15A
Regulatory Framework

3.15.2 Regulatory Framework

Federal

No federal laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of NBWRP Phase 2 or alternatives to recreation resources.

State

No State laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of NBWRP Phase 2 or alternatives to recreation resources.

Local

Association of Bay Area Governments

The Association of Bay Area Government (ABAG) manages and maintains the Bay Trail, which is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. The trail will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. The Bay Trail Plan, adopted by ABAG in July 1989, includes a proposed alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing.

Marin Countywide Plan

The Marin Countywide Plan contains the following goals and policies as related to Recreational Resources:

> **Goal PK-1A: High-Quality Parks and Recreation System.** Provide park and recreation facilities and programs to meet the various needs of all county residents.

Marin Countywide Bicycle Plan

The Marin County Department of Public Works has developed a Countywide Bicycle Plan (updated in 2008), which has evolved from the collaborative planning efforts of various Pedestrian and Bicycle Advisory Committees. The goal of the Bicycle Plan is to make Marin County a model community for alternative transportation by implementing safe bikeways and pedestrian networks. The plan describes existing bikeways and proposed bikeways that are estimated for completion within five to 25 years. The County also prepared a San Quentin Area Bicycle and Pedestrian Access Study in the spring of 2010 to study ways to improve access for non-motor vehicle transportation in the area. Access improvements for some of the projects identified in the study are currently being implemented including improving bicycle and pedestrian access for the north approach on the Richmond San Rafael Bridge (MTC, 2017).

San Rafael General Plan 2020

Goal 16: Bikeways. It is the goal of San Rafael to have safe, convenient and attractive bikeways and amenities.

C-26: Bicycle Plan Implementation. Make bicycling and walking an integral part of daily life in San Rafael by implementing the San Rafael's *Bicycle and Pedestrian Master Plan*.

Goal 17: Pedestrian Paths. It is the goal of San Rafael to have safe, convenient and pleasurable pedestrian paths and amenities.

Goal 29: Parks and Programs for All. It is the goal for San Rafael to have recreation facilities and programs, parks and playfields for all age groups throughout the community.

Novato General Plan 2035

The Novato General Plan requires Novato to "facilitate the development of an integrated trails system and a continuous Bay Trail that connects regional trails, schools, open space, parks, recreation facilities, and residential areas", as well as to "work with the Marin County Open Space District, ABAG, and other regional, state and federal agencies to implement the trail system as described in the Hamilton Bay Trail Public Access Plan, Marin Countywide Plan and ABAG Bay Trail Project", to "work with the Bay Area Ridge Trail Council to implement the Novato portion of the Bay Area Ridge Trail, encircling San Francisco Bay on ridge lines".

Goal LW 1: Provide recreation facilities and programs, parks and playfields for all age groups throughout the community.

Goal MO 4: Provide a safe and convenient bicycle and pedestrian network that accommodates all ages and abilities.

Goal SH 1: Maintain high levels of public safety and emergency preparation.

Novato Bicycle/Pedestrian Plan

The 2015 Novato Bicycle/Pedestrian Plan provides for a citywide network of bicycle paths, lanes and routes, along with bicycle-related programs and support facilities, intended to ensure bicycling becomes a viable transportation option for people who live, work and recreate in Novato. Current bikeway network information was gathered from meetings with the Novato Bicycle/Pedestrian Advisory Committee and City staff, combined with information on proposed routes from the previously adopted City of Novato Bicycle Plan (1995; updated in 2007).

City of Petaluma General Plan 2025

Goal 6-G-1: Parks and Recreation Retain and expand city-wide park and recreation assets and programs to maintain the quality of life they provide to the community.

Goal 6-G-2: Parks and Recreation Ensure park and recreational assets are maintained to allow safe access and use.

City of Sonoma General Plan 2006-2020

Goal ER-4: Respond to the recreational needs of the community.

Goal CE-1: Provide a safe walking environment throughout Sonoma.

Goal CE-2: Establish Sonoma as a place where bicycling is safe and convenient.

Napa County General Plan (2013)

Goal ROS-2: To create and maintain a high-quality system of parks, trails, and recreational, interpretive, and environmental education facilities.

Goal ROS-3: To make recreational, cultural, interpretive, and environmental education opportunities available to all county residents.

City of Napa General Plan

Goal PR-5: To develop a comprehensive system of trails for bicycle and pedestrian traffic both within the existing urbanized area and connecting to surrounding County areas.

Goal PR-6: To develop a major public multi-use trail and amenities along the Napa River, while protecting and enhancing the natural resources along the trail corridor.

City of American Canyon General Plan

Policy 7.1.1: Provide a sufficient number of mini, neighborhood, community and regional park facilities to achieve a minimum standard of 5 acres of parkland per 1,000 residents.

Policy 7.1.3: Work toward the establishment of a system of public parks interconnected by off-street trails or bicycle lanes.

Policy 7.1.4: Work toward the establishment of permanent baseball and softball fields in the City to ensure their continued availability should the Little League's existing leasehold for land adjacent to the Napa Junction School expire.

Policy 7.7.2: Require that parks are designed as safe places for both passive and active leisure activities.

Policy 7.7.4: Design and improve community and neighborhood parks according to the following: b. site uses so that they do not adversely impact adjacent residencies (e.g., locate high activity, noise-generating uses away from residencies).

Policy 7.8.1: Provide opportunities for a wide variety of recreational activities and park experiences, including active recreation such as basketball, baseball, soccer and volleyball, and passive recreation such as reading and sunbathing.

Policy 7.9.1: Continue to implement existing joint use agreements between the City and public agencies (e.g., school district) and seek out new opportunities to share established park and recreation resources for the common benefit of American Canyon residents.

APPENDIX 3.15B
Impact Summary by Service Area

This table provides a summary of potential project impacts related to recreation.

POTENTIAL IMPACTS AND SIGNIFICANCE – RECREATION

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.19.1: Temporary Disturbance to Recreational Facilities							
Proposed Action	LS	NI	LSM	LSM	NI	LSM	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	NI	NI	(a)	(a)	LSM

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.16
Aesthetics

3.16A. Setting and Regulatory Framework
3.16B. Impact Summary by Service Area

APPENDIX 3.16A
Setting and Regulatory Framework

3.16.1 Affected Environment

Novato SD

In the City of Novato, commercial development exists along U.S. 101 and is concentrated around areas of Redwood Boulevard and Rowland Boulevard. Scottsdale Pond, a reservoir that provides a scenic buffer between commercial centers, roadways, and residences, is adjacent to the commercial centers. From Scottsdale Pond, visitors get views of Mt. Burdell, which dominates the Novato skyline and is covered by oak woodland and open grassland. The Mt. Burdell Open Space Preserve, maintained and operated by the Marin County Open Space District, hosts a display of wildflowers in the spring. Views of these natural features are accessible by trails that switchback up the hillside.

Indian Valley Open Space Preserve, also maintained and operated by the Marin County Open Space District, contains heavily wooded oak woodlands, seasonal creeks, canyons and valleys that open up to grasslands. The trail that traverses the preserve is popular for its views of undisturbed natural areas. Bel Marin Keys in Ignacio is an unincorporated community in Marin County that contains waterfront homes along lagoons and Novato Creek. The Coastal Conservancy, in coordination with the San Francisco Bay Conservancy and the U.S. Army Corps of Engineers, has developed a Wetlands Restoration Plan for the Bel Marin Keys Unit V property, located in southeast Novato. This open space contains marshes and waterways that support wildlife and scenic vistas.

Segments of U.S. Highway 101 and State Route 37 in Novato are classified as "eligible" State scenic highways. A list of the relevant corridors and gateways is provided in **Table 3.16-1**. The City has also established roadways as locally-defined scenic routes. Atherton Avenue, Novato Boulevard and State Route 37 are considered gateways to Novato. The visual character experienced by roadway users is rural, with views of open space and rolling hills. Areas east of U.S. Highway 101, along Atherton Avenue toward the Petaluma River are characterized by open space, agricultural, coastal agricultural, and rural residential areas.

Existing project facilities include the Novato Sanitation District (SD) Recycled Water Facility (RWF) and several storage reservoirs which are primarily low-lying structures that do not obstruct viewsheds or scenic vistas.

SVCSD

Coastal bluffs, vineyards, rolling hills, and mountains define the aesthetic character of Sonoma County (Sonoma County, 2008). In southern Sonoma County, Sonoma Mountain and Arrowhead Mountain are valuable scenic landscape features. Sonoma Mountain defines the eastern edge of the Petaluma River basin between the cities of Petaluma and Sonoma and are described in more detail below for the City of Petaluma.

The NBWRP area includes the City of Sonoma and surrounding unincorporated Sonoma County land, which is characterized by rolling hills with vast expanses of vineyards, agricultural fields, and open space. The area includes both undeveloped areas, such as the valley oak woodlands of Sonoma Mountain, and urban areas in and around the city of Sonoma and the unincorporated communities of Boyes Hot Springs, Agua Caliente, and El Verano. Sonoma Valley is located on the western edge of the city outside of city limits. The valley landscape is relatively flat and fertile, lending itself to the presence of vineyards and other agriculture. The city of Sonoma maintains a "small town" atmosphere with suburban developments, small neighborhood parks, and commercial buildings.

TABLE 3.16-1: SCENIC HIGHWAYS, ROADWAYS, AND GATEWAYS IN THE NBWRP PHASE 2 AREA

Name	Location	NBWRP Phase 2 Service Area	Status
Marin County			
East Sir Francis Drake Boulevard alongside San Quentin Prison	Larkspur	MMWD	City of Larkspur Gateway
Southern Heights Ridge southbound on US Highway 101	Larkspur	MMWD	City of Larkspur Gateway
Northbound on US Highway 101 above the NWPRR right-of-way and just south of - before - the Lucky Drive intersection	Larkspur	MMWD	City of Larkspur Gateway
U.S. 101	North of State Route 37	Novato SD	Caltrans Eligible Scenic Highway; City of Novato Scenic Route
State Route 37	East from U.S. 101 east	Novato SD	Caltrans Eligible Scenic Highways; City of Novato Scenic Route
Atherton Avenue	East from U.S. 101 east	Novato SD	City of Novato Scenic Route
Sonoma County			
Various stretches of State Routes 12 and 121	Highway 12 from Highway 101 in Santa Rosa to Highway 121 north of Sonoma; Highway 121 in Sonoma to Highway 37	SVCSD, SCWA	Caltrans Eligible Scenic Highways
Napa Road	Broadway east then south to Fremont Drive/ State Routes 12 and 121	SVCSD	County Designated Scenic Corridor
Verano Avenue	Intersection of Verano Avenue and State Route 12	SCWA	City of Sonoma gateway
Napa County			
State Route 29	Throughout Napa County	Napa SD, American Canyon	Caltrans Eligible Scenic Highway
State Route 121	Eastern portion of the City of Napa	Napa SD	Caltrans Eligible Scenic Highway

SOURCE: Caltrans, 2015; City of Larkspur, 2010; City of Novato, 2014; City of Corte Madera, 2009; City of Sonoma, 2006; Napa County, 2008; Sonoma County, 2016

Caltrans has classified corridors along Highways 12/121 in the Sonoma area as either designated or eligible scenic highways (see Table 3.16-1). Similarly, Napa Road from 5th Street East to Highway 12/121 is classified as a scenic roadway in the Sonoma County General Plan. Viewsheds from these roadways are characterized by varying degrees of development, ranging from open space, agricultural (viticulture and agrarian), and riparian to commercial and residential development. Views of vineyards, rolling hillsides, and open space are evident from rural roads in the NBWRP area. Along Sonoma Creek, views from roadways that cross or parallel the creek, such as Highway 12/121, are characterized by dense, riparian vegetation.

A greenbelt surrounding the City of Sonoma is an important visual resource, consisting of hillsides and agricultural land. Open space within the city is comprised of agricultural land, hillsides, creeks, riparian corridors, parks, and small pockets of vineyard, garden, grazing, and horse pasture land. Two notable waterways that exist in Sonoma are Nathanson Creek, which flows from the northeast corner of the City through the east side residential area, and Fryer Creek, which flows from the west to the southwestern area of the city. Schocken Hill is another distinct visual resources. The hillside north of Vallejo Home State Park also contributes to the visual character of the area and remains protected as open space.

Existing facilities include the Sonoma Valley County Sanitation District (SVCSD) WWTP, the City of Sonoma storage tanks, and the Valley of the Moon Water District (VOMWD) corporation yard in El Verano. The WWTP, located south of the city on 8th Street East, includes primarily low-lying structures that do not obstruct viewsheds or scenic vistas. The storage tanks are located on a hillside and are visible from nearby neighborhoods and roadways. The storage tanks are surrounded by trees and shrubs that help them to blend into the landscape. The VOMWD corporation yard is located in a developed area with a mix of residential and commercial structures.

MMWD

Wooded hills, bay marshlands, low density residential development, and mountains define the aesthetic character of eastern and central Marin County. In the vicinity of the Central Marin Sanitation Agency (CMSA) wastewater treatment plant (WWTP), Mount Tamalpais, the San Francisco Bay, and Point San Quentin are notable scenic landscape features. Mount Tamalpais defines the western edge of the communities in the service area, while the San Francisco Bay defines the eastern edge. Creeks and valleys in the area are characterized by riparian forest, and a mixture of deciduous and evergreen tree species, which provide food, water, migration and dispersal corridors, breeding sites, and thermal cover for wildlife.

The service area for Marin Municipal Water District (MMWD) and CMSA includes the communities of San Rafael, Larkspur, Corte Madera, and the Ross Valley communities of Ross, San Anselmo, Sleepy Hollow, and Fairfax. These communities are characterized by low density single-family homes and commercial areas, with some industrial areas adjacent to Highway 101 in San Rafael. In the vicinity of the CMSA WWTP, the area includes both protected undeveloped areas, such as marsh lands and China Camp State Park, and urban areas.

Within this service area, there are no designated or eligible State scenic highways (see Table 3.16-1). Within the vicinity of the CMSA WWTP, a few roadways have been designated as gateways to the adjacent City of Larkspur. Viewsheds from the major roadways in the area, such as Highway 101, Interstate 580, and Sir Francis Drake Boulevard, are characterized by varying degrees of development, ranging from open space to commercial and residential development. Views of marsh, rolling hillsides, and open space are evident from major roads in the CMSA service area.

Existing project facilities include the CMSA WWTP, located between Andersen Drive and Interstate 580. The structures that comprise this facility are situated at the toe of the hillside and only visible from Interstate 580, and Sir Francis Drake Boulevard and industrial areas to the northeast. San Quentin State Prison is located to the south dominating San Quentin Point. Given the visual seclusion offered by the topography of the point, it is only visible from Sir Francis Drake Boulevard and the Golden Gate Ferry Larkspur Terminal and Larkspur-San Francisco ferries.

Napa SD

The Napa SD includes the City of Napa and adjacent portions of unincorporated Napa County. The county's natural scenery and its vineyards and wineries form the community character of the county. Napa County has a diverse plant life, including oak woodlands, grasslands, mixed serpentine chaparral, mixed willow riparian forests, redwood forests, and vernal pools. The landscape has a varied topography, with peaks and valleys, rolling hills, numerous microclimates, and many creeks, streams, and rivers.

The land uses in the unincorporated areas outside the City of Napa's jurisdiction are urbanized, non-agricultural rural residential uses or open space agricultural uses in the Coombsville planning area and south of the Silverado planning area. The "south county" contains more of the industrial uses. Important visual resources identified in the Napa County General Plan include:

1. Agricultural land, particularly the Hess Vineyard (located in southern Napa County east of the airport), and areas surrounding the City of Napa;
2. Open space;

3. The Napa River, which flows from its headwaters on Mt. St. Helena to San Pablo Bay through varied landscapes of forested mountain slopes, vineyards, urban areas, open pasture, grasslands, industrial zones, and marshes;
4. Landmarks, including the di Rosa Preserve, Trubody Ranch, and August Hirsh Winery;
5. Unique urban centers in Rutherford and Oakville, which host visitor-serving commercial uses, wineries, and other historic attractions; and
6. Scenic highways.

There are approximately 280 miles of county-designated scenic roadways in Napa County. Although none of the roads are officially designated as State scenic highways, segments of Highway 29, State Route 121 and State Route 221 are eligible for scenic highway designation (Napa County, 2008). Table 3.16-1 lists the scenic highways in Napa County within the NBWRP Phase 2 area.

The Napa Milliken-Sarco-Tulocay (MST) Area includes areas in the City of Napa and portions of Napa County. The unincorporated areas are designated for rural residential, open space, watershed, and agricultural uses by the Napa County General Plan. State Route 121, north of Imola Road, within the MST area, is designated as a scenic corridor by the City of Napa. The City is bound by designated greenbelt land, which borders the MST area to the east.

Existing facilities include the Napa SD facilities along Soscol Ferry Road and the Napa River, south of Highway 12. The structures and ponds here are mostly low-lying and do not obstruct any views or scenic vistas.

Petaluma

The eastern half of the City of Petaluma within the NBWRP Phase 2 area is a predominantly suburban area. Commercial development exists along the U.S. Highway 101 corridor concentrated along Petaluma Boulevard, McDowell Boulevard. Sonoma Mountain Parkway/Ely Boulevard, and East Washington Street. Shollenberger Park, in the southeast corner of the city adjacent to the Ellis Creek Water Recycling Facility (WRF) offers paths to walk along, with views of tidal wetlands and Adobe Creek, a wooded riparian corridor. Sonoma Mountain separate the cities of Petaluma and Sonoma and defines the eastern edge of the Petaluma River basin. As part of California's coastal range, the mountain peak is less than 1,000 feet above mean sea level, but provides scenic backdrops and visual relief from urban densities in the Petaluma area.

The *City of Petaluma General Plan* articulates the city's policies and vision to create and preserve distinct visual boundaries between itself and its neighbors through preserving natural features and agricultural land (City of Petaluma General Plan, 2008). A variety of natural and artificial or cultural features identified in the General Plan lend Petaluma a character distinct from other cities in Sonoma County or elsewhere in the San Francisco Bay Area. Features include structures such as the industrial "working grain elevators" rising above local development, the Great Petaluma Mill, and the old railroad; the Petaluma River, which provides a sense of direction and history, as well as a natural resource to the city.

Existing facilities include the Ellis Creek WRF, which includes facilities that are primarily low-lying structures. Ellis Creek WRF also offer public access to 4 miles of trail which ring the facility's polishing wetlands. Caltrans has no designated corridors as scenic highways in Petaluma.

American Canyon

American Canyon is located at the southeastern end of Napa County between the Napa River and the foothills of the Sulfur Springs Mountains. The city is mostly residential homes with open land and commercial warehouses located in the northern neighborhoods. Important visual resources identified in the *City of American Canyon General Plan* include the hillsides to the east, which provide a visual backdrop to the City, several creeks and streams including American Canyon Creek, North Slough, Rio Del Mar Creek, and the

Napa River and its associated marshlands. The overall visual character of the landscape in and around American Canyon is similar to the rest of Napa County – rolling open grass hills, vineyards, marshes, and low density residential developments. While the Highway 29 corridor is not identified as a visual resource, it is identified as providing "opportunities for enhancing the City's visual quality" (American Canyon, 1994). Highway 29 is also classified as an "eligible" State scenic highway.

Existing facilities include the American Canyon Waste Reclamation Facility (American Canyon WRF), located in the northwest corner of the City along the Napa River. The treatment plant is comprised of low-lying structures and ponds and does not obstruct any viewsheds or scenic vistas.

3.16.2 Regulatory Framework

Federal

No federal laws, regulations, standards, or policies govern the consideration of potential direct, indirect, or cumulative impacts of the NBWRP Phase 2 or alternatives to aesthetics.

State

Caltrans administers the State Scenic Highways Program to preserve and protect scenic highway corridors from development that would diminish the aesthetic value of lands adjacent to highways (Sections 260 *et seq*. of the California Streets and Highways Code). Scenic highway corridors are defined as the land generally adjacent to and visible by motorists from a scenic highway. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. As noted above, eligible or designated State scenic highways in proximity to NBWRP Phase 2 components include State Route 29, portions of State Route 12, and portions of State Route 121 (Caltrans, 2005).

Local

Local general plans, policies, and regulations are associated with impacts to aesthetic resources within the affected jurisdictions. The goals, policies, and programs applicable to aesthetics were considered in this analysis to define scenic resources, determine NBWRP consistency with policies, and evaluate significant impacts in the following section.

Marin County

In unincorporated Marin County, the Community Design Element of the Marin Countywide Plan (General Plan) governs the aesthetic resources within the county and defines goals, policies, and programs to address visual resource issues (Marin Countywide Plan, 2007). A policy that could affect the project is Design Goal 4 (DES-4).

> **Goal DES-4: Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features. Nine applicable program and policies under this goal could affect the project. Generally, these plans and policies protect public views of ridges and upland greenbelt areas and aim to minimize visual impacts of new structures.

MMWD/CMSA

City of San Rafael General Plan

In the *City of San Rafael General Plan 2020* the Community Design Element provides regulation associated with the visual resources of the City.

Goal 7: A Beautiful City. Maintain the best natural and built features to enhance the attractiveness of the City. Policy CD-5 (Views) seeks to enhance the views of specific landmarks, hills, and ridgelines from public streets, parks, and accessible pathways.

City of Larkspur General Plan

Policy f of Goal 2 in the Open Space Element of the City of Larkspur General Plan addresses the visual access to the Bay and Corte Madera Creek.

Novato SD

City of Novato General Plan

The Community Identity Element governs the aesthetic resources of the City of Novato.

Goal: Retain and promote the small town character of Novato including preservation of the historic features and landmarks. Two Community Identity policies and three program policies under this goal could affect the NBWRP Phase 2 components. These policies require utilities be installed underground and provide guidance for undergrounding existing above ground utilities.

Sonoma County

The Open Space Element and Land Use Element of the Sonoma County General Plan (Sonoma County, 2008) govern the visual and aesthetic resources of the county. Goals OS-1, OS-2, OS-3, and CDE-6 are related to preserving scenic and aesthetic resources such as community separators, scenic landscape units, and scenic highway corridors and could affect the project.

SVCSD/SCWA

City of Sonoma General Plan

The Community Development Element's Development Code and the Environmental Resources Element in the City of Sonoma 2020 General Plan govern the visual resources in the City.

Goal CD-5: Reinforce the historic, small-town characteristics that give Sonoma its unique sense of place. Policy CD-5.3, 5.5, 5.6, 5.7 and Implementation Measures 5.6.2 and 5.7.1 under this goal could affect the project. These goals and implementation measures protect scenic vistas and views, promote infill development, and include design improvements and requirements related to State Route 12, Broadway Street, and MacArthur Street, and the city's gateways.

Goal ER-1: Acquire and protect important open space in and around Sonoma. Policy ER-1.1, 1.2, 1.4, and 2.6 under this goal could affect the project. This goal relates to the acquisition and protection of open space, the greenbelt, and trees.

Petaluma

City of Petaluma General Plan

The Historic Preservation Element in the *City of Petaluma: General Plan 2025* in part governs the aesthetic resources in the City.

Goal 3-G-1: Policy 3-P-7 under this goal may affect this project. This policy is in place to recognize landscape features, including trees in both their urban and natural environment as one of the City's character defining features.

Napa County

The Land Use Element and Community Character Element in the Napa County General Plan govern aesthetics in the unincorporated areas of Napa County. Of importance to the project are Goals CC-1, 2, and 3.

Goal CC-1: Preserve, improve, and provide visual access to the beauty of Napa County.

Goal CC-2: Continue to promote the diverse beauty of the entire county for the benefit of residents, businesses, and visitors.

Goal CC-3: Recognize the role of the arts in contributing to the quality of life and the attractiveness of Napa County. Policy CC-1-16, and Policy AG/LU-94, 117, 21, and 74 are related to scenic and aesthetic resources and could affect the project. These policies require utilities be placed underground adjacent to scenic roadways and that the County seek to be involved in decisions related to utility placement that could negatively affect the visual character of the county.

Napa SD

City of Napa General Plan

The *City of Napa General Plan* Land Use Element governs aesthetic resources within the city of Napa.

Goal LU-1: To maintain and enhance Napa's small town qualities and unique community identity. Policy LU-1.1, 1.4, 1.5, 1.6, 1.7, Policy PR-7.10, and Program LU-1.A, 1.B, 1.C are related to scenic and aesthetic resources and could affect the project. These policies limit development along the Rural Urban Limit and Greenbelt, recommend design guidelines for gateways and scenic corridors identified in the General Plan, and create programs to initiate further study to identify major streets important for aesthetic reasons.

American Canyon

City of American Canyon

The Natural and Historic/Cultural Resources Element in the *City of American Canyon General Plan* governs the aesthetic resources in the City.

Goal 8D: Maintain the natural visual character of the City. The main objective of Policy 8.18 under this goal is to sustain the visual quality and character of American Canyon by preserving significant aesthetic resources. Specifically, under Policy 8.18.1 the plan mentions preservation of significant public views along major roadways, from public viewing areas, and other open spaces. While the project may not obscure these views, site development could hinder public access to vantage points associated with these views.

APPENDIX 3.16B
Impact Summary by Service Area

This table provides a summary of potential impacts related to aesthetics.

POTENTIAL IMPACTS AND SIGNIFICANCE – AESTHETICS

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	**Novato SD**	**Petaluma**	**SVCSD**	**SCWA**	**American Canyon**	**Napa SD**
Impact 3.16.1: Temporary Impact to Scenic Vistas.							
Proposed Action	LS	LS	LS	LS	NI	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/NI	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative:	(a)	LS	LS	NI	(a)	(a)	LS
Impact 3.16.2: Impact to views along scenic roadways.							
Proposed Action	NI	LSM	LSM	LSM	NI	LSM	LS
No Project/No Action Alternative	NI/NI	NI/LSM	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	LSM	LSM	NI	(a)	(a)	NI
Impact 3.16.3: Source of light or glare.							
Proposed Action	LS	LS	LS	NI	NI	LS	LSM
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	LS	NI	NI	(a)	(a)	NI
Impact 3.16.4: Long-term impact to aesthetic character.							
Proposed Action	LSM	LS	LSM	LSM	NI	LSM	LSM
No Project/No Action Alternative	NI/NI	NI/LS	NI/LSM	NI/NI	NI/NI	NI/LSM	NI/NI
Storage Alternative:	(a)	LSM	LSM	LSM	(a)	(a)	LSM

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation Incorporated

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.17
Energy Conservation

3.17A. Analysis (Energy Conservation)
3.17B. Impact Summary by Service Area

APPENDIX 3.17A
Analysis (Energy Conservation)

This analysis describes existing energy supply, demand, and conservation-related considerations in Section 3.17.1, *Affected Environment*. The regulatory framework that governs these considerations is presented in Section 3.17.2, *Regulatory Framework*. Section 3.17.3, *Direct and Indirect Effects*, defines significance criteria used for the impact assessment, analyzes the potential direct and indirect effects of the NBWRP Phase 2 and all alternatives, and summarizes such effects by service area. The analysis of *Cumulative Impacts* is found in Chapter 4.0. The Impact Summary table follows in Appendix 3.17B. No comments or other input were received during the scoping period for this EIR/EIS regarding energy conservation.

3.17.1 Affected Environment

The study area for the analysis of energy conservation impacts is state-wide in terms of energy supplies, and site specific in terms of the energy consumption.

3.17.1.1 California's Energy Supplies

California's per capita energy consumption ranked 49th in the nation, indicating a low per capita use of energy; the state's low use of energy was due in part to this mild climate and its energy efficiency programs (USEIA, 2017a). Nevertheless, with a population of 39.3 million people, California is the second largest energy-consuming state in the U.S. (USEIA, 2017b).

Electricity. The production of electricity requires the consumption or conversion of energy resources such as water, wind, oil, gas, coal, solar, geothermal, and nuclear sources. Of the electricity generated in California in 2016, 49.1 percent was generated by natural gas-fired power plants, 0.2 percent by coal-fired power plants, 12.3 percent from large hydroelectric dams, 9.6 percent from nuclear power plants, and 27.9 percent from renewable sources including solar and wind power. The remaining balance (0.9 percent) was generated from oil, other petroleum, and unspecified sources (CEC, 2017a).

Gasoline. Gasoline is by far the largest transportation fuel by volume used in California, with 97 percent of all gasoline being consumed by light-duty cars, pickup trucks, and sport utility vehicles. In 2015, 15.1 billion gallons of gasoline were sold (CEC, 2017b).

Diesel. Diesel fuel is the second largest transportation fuel used in California, representing 17 percent of total fuel sales behind gasoline. In 2015, 4.2 billion gallons of diesel was sold. Nearly all heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm, construction and heavy duty military vehicles and equipment have diesel engines. Diesel is the fuel of choice because it has 12 percent more energy per gallon than gasoline and has fuel properties that prolong engine life making it ideal for heavy duty vehicle applications (CEC, 2017c).

3.17.1.2 Local Energy Systems and Demand

Diesel and Gasoline Fuel. In 2015, retail sales of diesel fuel in Marin, Sonoma, and Napa counties totaled 29 million gallons (3 million gallons, 19 million gallons, and 7 million gallons, respectively). This suggests that the total diesel sales in these counties was approximately 61 million gallons (6 million gallons, 40 million gallons, and 15 million gallons for Marin, Sonoma, and Napa counties, respectively), given that approximately 47 percent of total diesel sales in California are associated with retail sales. The total 2015 sales of gasoline

within Marin, Sonoma, and Napa counties totaled 369 million gallons (105 million gallons, 201 million gallons, and 63 million gallons, respectively) (CEC, 2016).

Electricity. Electricity is generated and distributed via a network of high voltage transmission lines commonly referred to as the power grid. Pacific Gas and Electric Company (PG&E), Marin Clean Energy, and Sonoma Clean Energy provides electrical power to approximately 16 million people throughout a 70,000 square mile service area in Northern and Central California, including Marin, Sonoma, and Napa counties (PG&E, 2017). PG&E's service area extends from Eureka to Bakersfield (north to south), and from the Sierra Nevada to the Pacific Ocean (east to west). Marin Clean Energy and Sonoma Clean Energy serve Marin, Sonoma, and Mendocino counties and purchase from green energy sources, while using PG&E's distribution network. PG&E produces and purchases energy from a mix of conventional and renewable generating sources. **Table A3.17-1** shows the electric power mix that PG&E delivered to its customers in California in 2016.

Of the electricity delivered by PG&E to its customers in 2016, 17 percent was generated by natural gas-fired power plants, 12 percent came from large hydroelectric dams, and 24 percent came from nuclear power plants. The remaining in-state electrical power generation (47 percent) was supplied by renewable sources (33 percent) and other unspecified sources (14 percent) (PG&E, 2017). The most recent year for electrical energy consumption data (2015) by county shows that the amount of electrical energy consumed within Marin, Sonoma, and Napa counties totaled 5,366 million kilowatt-hours (1,363 million kilowatt-hours, 2,948 million kilowatt-hours, and 1,055 million kilowatt-hours, respectively) (CEC, 2017d).

TABLE A3.17-1: PG&E'S 2016 ELECTRIC POWER MIX DELIVERED TO CUSTOMERS

Power Source	Percentage of Total
Nuclear	24%
Natural Gas	17%
Large Hydroelectric	12%
Unspecified Sources*	14%
Eligible Renewables	33%

NOTE: * "Unspecified Sources" refers to electricity purchased from the grid that is not traceable to specific generation sources by any auditable contract trail.

SOURCE: PG&E, 2017.

3.17.2 Regulatory Framework

3.17.2.1 Federal

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act required that all vehicles sold in the U.S. meet certain fuel economy goals. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not subject to fuel economy standards. The Program would be consistent with the Act because all passenger cars and light trucks that would be used directly or indirectly associated with the Program would be required to comply with the applicable fuel economy standards.

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses

can obtain federal tax credits for fuel-efficient appliances and products, including buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. It is unknown whether or not any of the member agencies under the North Bay Water Reuse Authority (NBWRA) will attempt to obtain federal tax credits associated with the Program under the Energy Policy Act of 2005.

3.17.2.2 State

State of California Integrated Energy Policy

In 2002, the Legislature passed Senate Bill 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

The CEC adopted the 2013 Integrated Energy Policy Report on February 20, 2014. The 2013 Integrated Energy Policy Report provides the results of the CEC's assessment of a variety of issues, including: ensuring that the state has sufficient, reliable, and safe energy infrastructure to meet current and future energy demands; monitoring publicly-owned utilities' progress toward achieving 10-year energy efficiency targets; defining and including zero-net-energy goals in state building standards; overcoming challenges to increased use of geothermal heat pump/ground loop technologies and procurement of biomethane; using demand response to meet California's energy needs and integrate renewable technologies; removing barriers to bioenergy development; planning for California's electricity infrastructure needs given potential retirement of power plants and the closure of the San Onofre Nuclear Generating Station; estimating new generation costs for utility-scale renewable and fossil-fueled generation; planning for new or upgraded transmission infrastructure; monitoring utilities' progress in implementing past recommendations related to nuclear power plants; tracking natural gas market trends; implementing the Alternative and Renewable Fuel and Vehicle Technology Program; addressing the vulnerability of California's energy supply and demand infrastructure to the effects of climate change; and planning for potential electricity system needs in 2030 (CEC, 2013a).

Although the integrated energy plan is not directly applicable to the Program given that the projects under the Program would not include utility-scale energy generation or transmission infrastructure, it is applicable to the operations of PG&E, or any public utility that would provide the required electricity for operations under the Project. Given that PG&E is required to comply with the applicable provisions of the integrated energy plan, electricity obtained for the projects under the Program would be generated in a manner consistent with the spirit of the integrated energy plan.

Title 24 Building Energy Efficiency Standards (California Energy Code)

The California Building Standards Commission first established Energy Efficiency Standards for California in 1978, in response to a legislative mandate to reduce California's energy consumption. The standards, which are contained in the California Code of Regulations, Title 24, Part 6 (also known as the California Energy Code) are updated periodically by the CEC to allow consideration and possible incorporation of new energy efficiency technologies and methods. The standards regulate energy consumed in nonresidential buildings for heating, cooling, ventilation, water heating, and lighting. Any heating, cooling, ventilation, water heating, and/or lighting for pump station buildings developed under the Program would be required to comply with the standards of Title 24.

California Green Building Standards Code (Cal Green)

On January 1, 2014, the California Building Standards Commission adopted the California Green Building Standards Code (Part 11 of the Title 24 Building Standards Code) for all new construction statewide (CBSC, 2014). The code sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills, and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation, and acoustical wall and ceiling panels. Pump station buildings developed under the Program would be required to comply with the provisions of the California Green Building Standards Code.

3.17.2.3 Local

Marin Climate and Energy Partnership

The Marin Climate and Energy Partnership (MCEP) was initiated in 2007 recognizing the need for a partnership platform that would allow collaboration between jurisdictions in Marin County on the complex GHG reduction challenge. The MCEP's goal was to bring together representatives of all 11 Marin jurisdictions, the County, MMWD, and Transportation Authority of Marin, to develop the MCEP structure and goals and to develop the necessary resources to plan and implement coordinated GHG Reduction strategies among all local governments in Marin County, along with the transportation and water agencies.

One mission of the MCEP is to reduce GHG emission levels to the targets of Marin County and local municipalities in compliance with the standards set by AB 32, while also meeting the criteria air pollutant reduction goals of the BAAQMD. MCEP is directed by a Steering Committee consisting of one representative from each partner jurisdiction and agency, working in collaboration with relevant staff liaisons from member entities to implement a coordinated approach to local and regional emissions reduction targets and climate action planning goals.

City of American Canyon Energy Efficiency Climate Action Plan

The American Canyon Energy Efficiency Climate Action Plan will enable the City to lead the community with innovative programs for energy efficiency, sustainability, and climate change. The plan was designated to support (City of American Canyon, 2012):

> **General Plan Goal 8F:** Reduce consumption of nonrenewable energy sources and support the development and utilization of new energy sources.

The plan proposes feasible strategies and measures that cost-effectively reduce energy use and energy-related GHG emissions in both municipal operations and across the community.

3.17.3 Direct and Indirect Effects

3.17.3.1 Significance Criteria under CEQA

Consistent with **Appendix F** of the CEQA Guidelines, the NBWRP Phase 2 or an alternative would have a significant effect on the environment with respect to energy conservation if it would:

1. Use energy inefficiently, considering the amounts and types of fuels required for each stage of the project (i.e., construction, operation, maintenance, and decommissioning/ restoration);
2. Substantially increase demands on local and regional energy supplies (including peak and base period electrical and other energy demands), requiring additional capacity;
3. Fail to comply with existing energy standards; or
4. Use transportation energy inefficiently, considering each stage of the project (i.e., construction, operation, maintenance, and decommissioning/ restoration) and the availability of efficient transportation alternatives.

Based on the nature of the proposed action, the following significance criteria are not addressed further in the EIR/EIS:

Require or result in the construction of new electrical generation and/or transmission facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects. The projects under the Program would not require or result in the construction of new or expanded electrical generation and/or transmission facilities. At the most, new underground and/or aboveground distribution power lines would be constructed only to connect the proposed facilities to the existing local PG&E power grid.

Conflict with energy standards, including standards for energy conservation. The local government jurisdictions that encompass the project area, including Marin, Sonoma, and Napa counties, and the cities of Novato, Petaluma, Petaluma, Sonoma, Napa, and American Canyon have incorporated the California Building Standards Code by reference into their municipal codes. As described in **Section 3.17.2.2** Part 6 of the California Building Standards Code contains the California Energy Code (CCR Title 24, Part 6). The local government building permit application review process would ensure that projects under the Program are compliant with all applicable state and local energy conservation standards. In addition, Program would not be applicable to, or not conflict with, energy conservation plans, policies, or regulations. Therefore, no impact related to compliance with applicable energy and energy conservation standards would result, and this criterion is not discussed further in this section.

3.17.3.2 Direct and Indirect Effects

In addition to the Proposed Action, the following impact analyses also evaluate the No Project, No Action, and Storage alternatives.

Under the No Project Alternative, no expansion of recycled water systems would occur within the NBWRP Phase 2 area.

Under the No Action Alternative, it is assumed that four of the Proposed Action projects above would be pursued in the absence of Title XVI funding. These are the Marin County Lower Novato Creek Project – Distribution (Novato SD; 1.1 miles of pipeline, 40 AFY yield), Turnouts to Wetlands (Novato SD; 0.02 miles of pipeline, 840 AFY yield), Urban Recycled Water Expansion (Petaluma; 8.0 miles of pipeline, 223 AFY yield), and the first phase of American Canyon's Recycled Water Distribution System Expansion (1.7 miles of pipeline, 84 AFY yield).

The Storage Alternative would include facilities identified under the Proposed Action, as well as additional storage, treatment and distribution facilities to provide operational flexibility within Member Agency service areas. This would include the construction of a total of 1,099 AF of recycled water storage facilities including: additional capacity and seasonal storage of 150 AF of secondary treated water in Novato SD, 49 AF of tertiary treated water storage for SVCSD, 300 AF of secondary treated water storage for Petaluma Ellis Creek Water Recycling Facility (WRF), and 600 AF of tertiary treated water storage for Napa SD along with 9.24 miles of distribution pipelines. Implementation of this Alternative would result in a combined construction footprint of approximately 79 acres, and would provide an additional 1,934 AFY of recycled water compared to the Proposed Action, for a total yield of 6,819 AFY of recycled water supply.

With regard to NEPA, the Council on Environmental Quality (CEQ) regulations 40 CFR 1502.16(e) require analysis of "energy requirements and conservation potential of various alternatives and mitigation measures."

Approach to Analysis. This analysis is based, in part, on basic assumptions regarding construction-related diesel and gasoline consumption as well as the operational electricity requirements for the individual projects proposed under the Program. The analysis focuses on the anticipated energy demand and energy efficiency of the Program as a whole, including during construction, operation, maintenance, and decommissioning of the proposed facilities. This analysis assumes all electrical power needed for operations under the Program would be provided by the local PG&E electrical power grid.

Fuel Consumption. Off-road equipment inventories and construction and maintenance activity assumptions were used to estimate fuel amounts that would be consumed by off-road equipment during construction and maintenance of the project, as well as to estimate diesel fuel amounts that would be necessary for routine testing and maintenance of emergency generators. Fuel consumption factors for off-road equipment were derived from equipment inventory data using the California Air Resources Board's (CARB) off-road emissions inventory database (CARB, 2007). Fuel use that would be associated with commuting workers and truck hauling during construction and operation of the project were also estimated using trip data projected for the project (see **Appendix G1** for all fuel consumption factors and assumptions).

Electricity Usage. Annual electricity usage that would be associated with NBWRP Phase 2 has been estimated by Kennedy/Jenks Consultants (2017). Energy efficiency elements would be incorporated into any building support systems, electrical and treatment equipment, and process design associated with NBWRP Phase 2. Building support systems would comply with Title 24 Building Energy Efficiency Standards. These standards include the use of motion detectors for lighting, energy-efficient fluorescent lamps for interior lighting, and high pressure sodium vapor lamps for exterior lighting. Piping system materials and sizing would be designed to limit pressure losses and reduce pumping and energy requirements. Electrical and treatment equipment would include variable frequency drives to reduce the operating speed of pumps to match the pump discharge pressure requirements and reduce energy usage.

Impact 3.17.1: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during construction and decommissioning. (Less than Significant with Mitigation)

No Project/No Action Alternative

Under the No Project Alternative there would be **no impact**.

Under the No Action Alternative, total fuel consumption that would be associated with NBWRP Phase 2 would be less than discussed for the Proposed Action below, but could still result in the wasteful or inefficient use of energy, which would be considered a significant impact. The impact would be **less than significant with mitigation** with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**.

Proposed Action

Construction of the proposed NBWRP Phase 2 would require the use of fuels (primarily diesel and gasoline) for operation of construction equipment (e.g., loaders, excavators, and cranes), construction vehicles (e.g., haul trucks), and construction worker vehicles. Direct energy use may also include the use of electricity required to power construction equipment (e.g., welding machines and electric power tools). In addition, project construction would result in indirect energy use associated with the extraction, manufacturing, and transportation of raw materials to make construction materials. Indirect energy use typically represents about three-quarters of the total construction-related energy consumed, while direct energy use represents about one-quarter (Hannon et al., 1978).

Although the precise amount of construction-related direct energy consumption that would occur under the Program is unknown, it is estimated that off-road construction equipment would operate for a total of approximately 75,270 hours and would consume a total of approximately 190,154 gallons of diesel fuel at an average rate of 2.5 gallons per hour. With regard to vehicle use during construction, workers' personal vehicles would make 40,164 trips and consume approximately 19,403 gallons of gasoline (assuming an average fuel economy of 20.7 miles per gallon) and heavy haul trucks would make 6,232 trips and consume approximately 26,710 gallons of diesel fuel (assuming an average consumption rate of 7.0 miles per gallon) (see **Appendix 3.9** for all assumptions and fuel use factors). Based on the worst-case construction phasing developed for Program emissions and fuel modeling, the Program would be constructed over a period of approximately 3.5 years. When averaged over the 3.5-year construction period, annual fuel use for off-road construction equipment would be approximately 54,330 gallons of diesel fuel per year, construction workers' personal vehicles would consume approximately 5,544 gallons of gasoline per year, and heavy haul trucks would consume approximately 7,631 gallons of diesel fuel per year. The total annual average fuel use during the 3.5-year construction period would be approximately 61,961 gallons per year of diesel fuel and approximately 5,544 gallons per year of gasoline.

These annual average fuel use amounts are equivalent to 0.21 percent of the total amount of diesel fuel and less than 0.01 percent of the total amount of gasoline fuel sold in the Program area counties (i.e., Marin, Sonoma, and Napa) in 2015 (see **Section 3.17.1.2, *Local Energy Systems and Demand***). With regard to decommissioning of the project, amounts of direct energy consumption that would occur at the end of the useful life of the project (typically considered to be approximately 30 years for most projects) related to decommissioning is unknown; however, it is anticipated that the amounts would be similar to or less than those required for construction, discussed above.

The amount of electricity and indirect energy consumption that would be associated with construction of the project is unknown and cannot be estimated as it would be too speculative given existing data; however, the amounts would not be expected to be substantial.

While the overall transportation energy use requirements would not be significant relative to the overall sales of transportation fuels in the Program area counties, construction and decommissioning activities could result in wasteful or inefficient use of energy. For all projects under the Program, the potential for construction and decommissioning to use large amounts of fuel or energy in a wasteful or inefficient manner is considered a significant impact. However, with implementation of **Mitigation Measures 3.9.1-1a** (BAAQMD Basic Construction Measures) and **3.9.1-1b** (Additional Construction Mitigation Measures), which would ensure construction activities are conducted in a fuel-efficient manner by requiring that all equipment be properly tuned and maintained and by minimizing idling times for construction equipment and vehicles, the impact would be **less than significant with mitigation**.

Program Elements

Six additional projects are evaluated at a program elements level because they are currently conceptual and would not be implemented until additional design and funding become available. The projects include a seasonal storage and a restoration project (Novato SD), a distribution pipeline in City of Petaluma, an operational storage facility for Napa SD, and two aquifer storage projects in the City of Sonoma for SCWA. The fuel consumption that would be associated with construction and decommissioning of these projects would be similar to the fuel consumption disclosed for the individual NBWRP Phase 2 discussed above. The program elements combined with the NBWRP Phase 2 would result in the use of large amounts of fuel that could result in the wasteful or inefficient use of energy, which would be considered a significant impact. However, with implementation of Mitigation Measures 3.9.1-1a and **3.9.1-1b**, which would ensure construction activities are conducted in a fuel-efficient manner by requiring all equipment to be properly tuned and maintained and by minimizing idling times for construction equipment and vehicles, the CEQA impact would be **less than significant with mitigation**.

Storage Alternative

The Storage Alternative would include facilities identified under the Proposed Action, as well as additional storage, treatment, and distribution facilities to provide operational flexibility within Member Agency service areas. Total energy consumption that would be associated with the Storage Alternative projects and NBWRP Phase 2 would result in the use of large amounts of fuel that could result in the wasteful or inefficient use of energy, which would be considered a significant impact. However, with implementation of **Mitigation Measures 3.9.1-1a** and **3.9.1-1b**, which would ensure construction activities are conducted in a fuel-efficient manner by requiring all equipment to be properly tuned and maintained and by minimizing idling times for construction equipment and vehicles, the CEQA impact would be **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure 3.9.1-1a: BAAQMD Basic Construction Measures

Mitigation Measure 3.9.1-1b: Additional Construction Mitigation Measures

(See Impact 3.9.1 in **Section 3.9, *Air Quality***, for descriptions.)

Impact Significance After Mitigation: Less than Significant.

Impact 3.17.2: Use large amounts of fuel and energy in an unnecessary, wasteful, or inefficient manner during operations and maintenance. (Less than Significant)

No Project/No Action Alternative

There would be **no impact** under the No Project Alternative.

Under the No Action Alternative, total operational electrical power and diesel fuel demand for these NBWRP Phase 2 would be less than discussed for the Proposed Action below. There would be no adverse effect related to the use of electricity and fuel during operations.

Proposed Action

Operation of several of the NBWRP Phase 2 projects, including Novato Recycled Water Facility (RWF) Treatment Capacity Expansion, Ellis Creek WRF Increased Capacity, Soscol WRF Increased Filter Capacity, San Quentin Prison Recycled Water Distribution, and the American Canyon WRF Phase 2 Treatment Plant Upgrades, would result in the consumption of electricity and diesel fuel. Electricity usage would primarily be associated with operation of new pumps and building support facilities (e.g., lighting), while diesel fuel would be used for routine testing and maintenance for new emergency generators that would supply energy for NBWRP Phase 2 in the event of a power outage.

Table A3.17-2 identifies the estimated operational electrical power and diesel fuel demand for these NBWRP Phase 2 projects. It is estimated that the projects under the Program would consume a total of approximately 1,636 MWh (megawatt hours) of electricity per year (Kennedy/Jenks Consultants, 2017). Therefore, the net increase in annual electrical power demand for recycled water production and conveyance would be approximately 1,636 MWh per year, which would equal approximately 0.03 percent of the total electrical demand in the Program area (i.e., within Napa, Sonoma, and Marin counties). Overall, the amount of diesel required to fuel the emergency generator testing and maintenance during operation and maintenance of the project would be relatively small (approximately 1,434 gallons annually).

TABLE A3.17-2: OPERATIONAL ENERGY CONSUMPTION FOR NBWRP PHASE 2

NBWRP Phase 2	Electricity Consumption (MWh/year)	Diesel Fuel Consumption for Emergency Generator Testing (gallons/year)
RWF Treatment Capacity Expansion	200	88
Ellis Creek WRF Increased Capacity	740	385
Soscol WRF Increased Filter Capacity	390	163
San Quentin Prison Recycled Water Distribution System	86	250
WRF Phase 2 Treatment Plant Upgrades	220	548
Total	1,636	1,434
Percent Relative to Program Area Usage	0.03%	<0.01%

SOURCES: Kennedy/Jenks Consultants, 2017; ESA, 2017.

This fuel use would be necessary to support operation and maintenance of the Program and would be equivalent to less than 0.01 percent of the total amounts of diesel fuel sold in the Program area (i.e., Marin, Sonoma, and Napa counties) in 2015 (see **Section 3.17.1.2, *Local Energy Systems and Demand***). The overall transportation energy use requirements during operation and maintenance would not be significant relative to the overall sales of transportation fuels in the Program area.

Operation of the NBWRP Phase 2 would not result in unnecessary consumption of energy. Operation would use fossil fuels and electricity to increase production of recycled water supplies and convey the water to the service areas of Member Agencies. While the proposed action would require a modest amount of electricity and fuel each year to operate, it would result in the displacement of potable water for recycled water at various locations in the North Bay. Since preparation of potable water is more energy intensive than preparation of recycled water, there could be a net decrease in electricity usage associated with the Program compared to existing conditions if the proposed recycled water would replace the equivalent production of potable water (CEC, 2005). Further, NBWRP Phase 2 would not consume energy wastefully or inefficiently. Therefore, electricity consumed as a result of Program operations would not be unnecessary, wasteful, or inefficient and the impact related to the use of fuel and energy during operations would be **less than significant**.

Program Elements

Three of the program elements (seasonal storage for Novato SD and two aquifer storage projects in City of Sonoma for SCWA) would require pump stations that use electricity and may require emergency backup generators. The size and use parameters of the pump stations and associated emergency generators are currently unknown; however, the annual operational energy consumption would be similar to the energy consumption requirements disclosed for the San Quentin Prison expansion project in **Table A3.17-2** for NBWRP Phase 2. Operation of the program elements and the NBWRP Phase 2 would not result in unnecessary consumption of energy, and while the projects would require a modest amount of electricity and fuel each year to operate, they would result in the displacement of potable water for recycled water at various locations in the North Bay that could cause a net decrease in electricity usage associated with the Program compared to existing conditions. Further, the program elements and NBWRP Phase 2 would not consume energy in an unnecessary, wasteful, or inefficient manner. The CEQA impact related to the use of fuel and energy during operations would be **less than significant**.

Storage Alternative

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment, and distribution facilities to provide operational flexibility within Member Agency service areas. Four of the Storage Alternative projects, including the Novato SD RWF and the Novato SD, SVCSD, and Napa SD storage projects, would require electricity for pumping and may require emergency generators to power facilities in the event of a power outage. The annual operational energy consumption associated with the pump stations and emergency generators would be similar to the energy consumption requirements disclosed in **Table A3.17-2** for NBWRP Phase 2. Operation of the Storage Alternative projects and NBWRP Phase 2 would not result in unnecessary consumption of energy, and while the projects would require a modest amount of electricity and fuel each year to operate, they would result in the displacement of potable water for recycled water at various locations in the North Bay that could cause a net decrease in electricity usage associated with the Program compared to existing conditions. Further, the Storage Alternative projects and NBWRP Phase 2 would not consume energy in an unnecessary, wasteful, or inefficient manner. The impact related to the use of fuel and energy during operations would be **less than significant**.

Mitigation Measures

None required.

Impact 4.17.3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations. (Less than Significant)

No Project/No Action Alternative

Under a No Project Alternative there would be **no impact**.

Under the No Action Alternative, total operational electrical power and diesel fuel demand for NBWRP Phase 2 would be less than discussed for the Proposed Action below. There would be no adverse effect related to the use of electricity and fuel during operations.

Proposed Action

The Program's impact on local and regional energy supplies depends on several factors; however, given that the Program's modest energy demand would be spread throughout the Program area (i.e., within Marin, Sonoma, and Napa counties) at locations currently served by electricity providers, there would be adequate capacity and infrastructure available to support the Program. Therefore, implementation of the NBWRP Phase 2 could be accommodated by the existing local and regional energy supplies and the impact would be **less than significant**

Program Elements

Same as discussed above for NBWRP Phase 2, given that the modest operational energy demand that would be associated with the program elements and NBWRP Phase 2 would be spread throughout the Program area at locations currently served by electricity providers, there would be adequate capacity and infrastructure available to support the projects. Therefore, implementation of the program elements would be accommodated by the existing local and regional energy supplies, and the CEQA impact would be **less than significant**.

Storage Alternative

The Storage Alternative includes facilities identified under the Proposed Action, as well as additional storage, treatment, and distribution facilities to provide operational flexibility within Member Agency service areas. Four of the Storage Alternative projects, including the Novato SD RWF and the Novato SD, SVCSD, and Napa SD storage projects, may require electricity for pumping and emergency generators to power the facilities in the event of a power outage. The energy demand that would be associated with the Storage Alternative projects and NBWRP Phase 2 would not be substantial and would be spread throughout the Program area at locations currently served by electricity providers where there would be adequate capacity and infrastructure available to support the projects. Therefore, implementation of the Storage Alternative and NBWRP Phase 2 would be accommodated by the existing local and regional energy supplies, and the CEQA impact would be **less than significant**.

Mitigation Measures

None required.

3.17.3.3 Impact Summary by Service Area

Appendix 3.17B provides a summary of potential Project impacts per Member Agency related to energy conservation.

APPENDIX 3.17B
Impact Summary by Service Area

This table provides a summary of potential impacts related to energy conservation.

POTENTIAL IMPACTS AND SIGNIFICANCE – ENERGY CONSERVATION

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.17.1: Unnecessary, wasteful, or inefficient fuel/energy usage - construction and decommissioning.							
Proposed Action	LSM	LSM	LSM	LSM	LSM	LSM	LSM
No Project/No Action Alternative	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM	NI/LSM
Storage Alternative	(a)	LSM	LSM	LSM	(a)	(a)	LSM
Impact 3.17.2: Unnecessary, wasteful, or inefficient fuel/energy usage - operations and maintenance.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.17.3: Constrain local or regional energy supplies, require additional capacity, or affect peak and base periods of electrical demand during operations.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE	NI/NAE
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTE:

NI = No Impact
NAE = No Adverse Effect
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.18
Environmental Justice

3.18A. Regulatory Framework
3.18B. Impact Summary by Service Area

APPENDIX 3.18A
Regulatory Framework

3.18.2 Regulatory Framework

Federal

The 1994 Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629; Feb. 16, 1994), requires each federal agency to "conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities, because of their race, color, or national origin." Section 1-101 of the order requires federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of programs on minority and low-income populations.

The Council on Environmental Quality (CEQ) coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. The Presidential Memorandum accompanying EO 12898 stipulates that "each Federal Agency shall analyze the environmental effects, including health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." Accordingly, the CEQ has developed guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. The CEQ's *Environmental Justice Guidance under the National Environmental Policy Act* advises agencies to consider the composition of the affected area; determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the proposed action; and, if such populations exist, determine whether there may be disproportionately high and adverse environmental effects on these populations (CEQ, 1997).

In 1998, USEPA published Guidance for Incorporating Environmental Justice Concerns in the USEPA's National Environmental Policy Act Compliance Analysis. This guidance presents procedures to evaluate disproportionately high and adverse effects on minority and low-income populations (USEPA, 1998).

State

California Government Code

While there is no legal requirement to address environmental justice issues under CEQA, the State of California—following the adoption of EO 12898—passed a series of environmental justice regulations. California Government Code Section 65040.12 defines environmental justice as the "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Legislative and executive actions related to environmental justice in California have been largely procedural, including but not limited to the formation of environmental justice advisory committees and the assignment of

coordinating roles and responsibilities to the Governor's Office of Planning and Research and the California Environmental Protection Agency.

California Environmental Quality Act

Per CEQA guidelines Section 15131, "Economic or social information may be included in an EIR or may be presented in whatever form the agency desires." The section continues:

a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. […] Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.

c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. […]

Local

The Marin Countywide Plan identifies general environmental inequities in Marin based on both race and income level relating to access and exposure to healthy food, air, and soils and sets a goal to ensure that all persons in Marin live in a safe and healthy environment (County of Marin, 2014). However, there are no specific goals or policies in the plan that would direct the analysis of environmental justice impacts.

The Napa County General Plan identifies one policy related to environmental justice in its Agriculture and Land Use element:

> ***Policy AG/LU-106*:** The County shall seek to ensure that equal treatment is provided to all persons, communities, and groups within the county in its planning and decision-making processes, regardless of race, age, religion, color, national origin, ancestry, physical or mental disability, medical condition, marital status, gender, self-identified gender or sexual orientation, or economic status (Napa County, 2013).

The General Plans for Sonoma County and the cities of San Rafael, Novato, Sonoma, Petaluma, Napa, and American Canyon do not discuss environmental justice issues.

APPENDIX 3.18B
Impact Summary by Service Area

This table provides a summary of potential impacts related to environmental justice.

POTENTIAL IMPACTS AND SIGNIFICANCE – ENVIRONMENTAL JUSTICE

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.18.1: Project construction could result in significant environmental impacts that could disproportionately affect minority or low-income populations							
Proposed Action	LSM	LSM	LSM	NI	NI	LSM	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.18.2: Project operation could result in significant environmental impacts that could disproportionately affect minority or low-income populations							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative	(a)	NI	NI	NI	(a)	(a)	NI
Impact 3.18.3: The Project could result in an increase water and sewer fees that would disproportionately affect minority or low-income populations.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.18.4: The Project could adversely affect farm worker employment.							
Proposed Action	LS	LS	LS	LS	LS	LS	LS
No Project/No Action Alternative	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS	NI/LS
Storage Alternative	(a)	LS	LS	LS	(a)	(a)	LS

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant with Mitigation

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 3.19
Socioeconomics

3.19B. Impact Summary by Service Area

APPENDIX 3.19B
Impact Summary by Service Area

This table provides a summary of potential impacts related to socioeconomics.

POTENTIAL IMPACTS AND SIGNIFICANCE – SOCIOECONOMICS

Proposed Action	Impact by Member Agency Service Areas						
	MMWD	Novato SD	Petaluma	SVCSD	SCWA	American Canyon	Napa SD
Impact 3.19.1: Project construction and operation would increase jobs, wages and salaries, resulting in regional economic benefits.							
Proposed Action	LS	LS	LS	LS	NI	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/LS	NI/NI	NI/NI	NI/LS	NI/NI
Storage Alternative:	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.19.2: Project implementation could affect the agricultural economy.							
Proposed Action	LS	LS	LS	LS	NI	LS	LS
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	LS	LS	(a)	(a)	LS
Impact 3.19.3: Impact to Winery-related Industry. Recycled water deliveries to vineyards would support the winery-related tourism industry.							
Proposed Action	NI	NI	LS	LS	NI	NI	LS
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	LS	LS	(a)	(a)	LS
Impact 3.19.4: Increase in water/sewer charges. Project implementation could increase municipal and industrial customer water or sewer charges.							
Proposed Action	LS	LS	LS	LS	NI	LS	LS
No Project/No Action Alternative	NI/NI	NI/LS	NI/LS	NI/NI	NI/NI	NI/LS	NI/NI
Storage Alternative:	(a)	LS	LS	LS	(a)	(a)	LS
Impact 3.19.5: Impact on Recreational Spending. Recycled water deliveries that would enhance restoration areas could increase recreational spending in the region.							
Proposed Action	NI	NI	NI	NI	NI	NI	NI
No Project/No Action Alternative	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI	NI/NI
Storage Alternative:	(a)	NI	NI	NI	(a)	(a)	NI

NOTES:

NI = No Impact
LS = Less than Significant impact, no mitigation required

(a) This Member Agency does not have an additional project under the Storage Alternative. Therefore, this agency's impact finding under the Storage Alternative is considered the same as the impact finding under the Proposed Action.

Appendix 4
Cumulative Impacts

4.2.4 Type of Projects Considered

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY

Jurisdiction	Project	Area Affected	Status
CURRENT AND ONGOING PROJECTS			
Marin County			
Caltrans District 4	Marin 101 HOV Lane Gap Closure	Lucky Drive in Corte Madera to North San Pedro Road in San Rafael	Undefined
Golden Gate Bridge, Highway and Transit District	Golden Gate Bridge Seismic Retrofit Phases 1 – 3A	Golden Gate Bridge/US 101	Current
Metropolitan Transportation Commission	Richmond-San Rafael Bridge Access Improvements	San Rafael/San Quentin, I-580	Current
Marin County Transit District	Relocate Transit Maintenance Facility, Preliminary Engineering	Marin County, underdetermined	Current
Sonoma-Marin Area Rail Transit	Sonoma Marin Rail Corridor, Passenger Rail Service & Non-motorized Pathway	Cloverdale to the Larkspur Ferry Terminal	Current, future extension(s) dependent on funding
Transportation Authority of Marin	Central Marin Ferry Access Improvements	Cal Park Hill path to East Sir Francis Drake Boulevard	Current
	North/South Greenway Gap Closure	Corte Madera and Larkspur	2015-Present
Marin County Department of Public Works	Culvert Replacements	Countywide	Through 2020
Marin County Flood Control and Water Conservation District	Novato Creek Sediment Removal	Novato	2016 and 2020, 5-year cycle
California Department of Fish and Wildlife/Marin Audubon Society	Corte Madera Ecological Reserve Expansion	72 Industrial Drive, Corte Madera	Underway
San Rafael			
City of San Rafael Department of Public Works	Miscellaneous Corrugated Metal Pipe Repair and Replacements	Citywide	Through 2020
	San Rafael Canal Dredging	North of I-580,east of US 101	2018-2019
	Miscellaneous street resurfacing and work within right-of-way	Citywide	Through 2020
	3rd Street/Hetherton Street Intersection Improvements	Downtown San Rafael at US 101	Through 2020
	Grand Avenue Bicycle Pedestrian Improvements	Grand Avenue over San Rafael Canal, east of US 101	Current
	Traffic Signal Control Upgrades	Citywide	Through 2020
	South Grand Avenue/West 2nd Street Intersection Improvements	San Rafael, east of US 101	Through 2017
	Francisco Boulevard East Improvements	East of US 101	Through 2017
	Third and Irwin Intersection Paving Improvements	Third Street and Irwin Street, east of US 101	Through 2017
City of San Rafael Community Development Department	Peter's Beacon Service Station	108 Bellam Boulevard	2017-2018
	Home Depot Garden Center Expansion	111 Shoreline Parkway	2017-2018
	New Church	3255 Kerner Boulevard	Undefined
Larkspur			
City of Larkspur	Commercial/Residential Mixed Use	285 Magnolia Avenue	Through 2018
Novato			
City of Novato Department of Public Works	Hamilton Levee Seepage Collection System, Phase II	Former Hamilton Air Force Base	Complete by end of 2017

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
CURRENT AND ONGOING PROJECTS (cont.)			
Novato (cont.)			
City of Novato Department of Public Works (cont.)	Novato Boulevard Widening, Diablo to Grant	Downtown Novato	Current
	Olive Avenue Class II Bike Lanes	Eastern Novato, US 101 overpass to Atherton Avenue	Current
	Redwood Boulevard at San Marin Improvements	Near US 101/Atherton Avenue interchange	Through 2020
	Traffic, Bicycle, Pedestrian Enhancements	Citywide	Funded through 2019
	DeLong Avenue and Ignacio Boulevard Resurfacing	Novato at US 101 interchanges with DeLong Avenue and Ignacio Boulevard	Current
	Vineyard Road Improvements	Novato, from Wilson Avenue to Sutro Avenue	Current
	Measure A Pavement Rehabilitation	Citywide	Through 2021
	SMART Bike Path	• Hamilton Station to Hamilton Parkway • Franklin Avenue to Grant Avenue • Rush Creek Place to San Marin Station	Undefined
	Novato Creek Maintenance Sediment Removal Project	Novato, Warner, and Arroyo Avichi Creeks; behind Century Plaza Movie Theater	July through October 2016
	Olive Avenue Road upgrades	Olive Ave (0.5 mile) down to Hwy. 37	Undefined
	Olive Avenue Class II Bike Lanes	Olive Ave. to Samrose Drive	Sept. 2016
	Novato Blvd. improvements (widening to four lanes)	Diablo Ave. To Grant Ave.	NOP 2010
City of Novato Parks, Recreation, & Community Services	Reservoir Hill Trail & Scottsdale Marsh Maintenance & Signage	Hamilton Parkway	Current
Sonoma County			
Caltrans District 4	US 101 Marin-Sonoma Narrows B2, Phase 2 Sonoma Median Widening HOV Lanes	Petaluma Boulevard South to Marin/Sonoma County Line	Current
	MSN C2- Hwy 101 HOV Lane, Relocate existing 33" Petaluma Aqueduct to accommodate Caltrans HOV lane project	Lakeville Highway to Old Redwood Highway, Petaluma	Through 2021
Sonoma County (General)	Radio Infrastructure (communication towers)	Various locations including Sears Point	In design
	Veterans/ Community Bldgs. Maintenance and Repairs	1094 Petaluma Blvd., Petaluma	2017-2018
	Veterans/ Community Bldgs. Maintenance and Repairs	126 West Street, Sonoma	2017-2018
	Neighborhood Placed Service (Human Services Department)	Various locations including Petaluma Rohnert Park and Sonoma	In construction
Sonoma County Regional Parks	Bay Trail	Sear's Point to Tolay Creek; Petaluma Marsh Trail	In construction
	Bay Trail	Parallel to SR 37 from Napa/Solano County west to Sears Point; Southern Sonoma/Schellville north to SR 12.	2017-2021

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
CURRENT AND ONGOING PROJECTS (cont.)			
Sonoma County			
Sonoma County Regional Parks (cont.)	Central Sonoma Valley Trail	Parallel to SR 12 between Verano Avenue and Agua Caliente Road; Verano Avenue between Sonoma Creek and Main Street	Current
	Larson Park Improvements	329 DeChene Avenue, Sonoma	2018
	Maxwell Farms Redevelopment	Sonoma	2017-2018
Sonoma County Transportation and Public Works Department	Road Pavement Preservation, Sonoma area	• Arnold Drive from Boyes Boulevard to Madrone-Agua Caliente Road • Grove Street from White Alder to Arnold Drive • Verano Boulevard from Bridge to Main Street • Fifth Street East to Napa Road • Eighth Street East to Napa Road	2018-2019
	Road Pavement Preservation, Petaluma area	Lynch Street from Adobe to Harden Lane	2018-2019
Sonoma-Marin Area Rail Transit	Sonoma Marin Rail Corridor, Passenger Rail Service & Non-motorized Pathway	Cloverdale to the Larkspur Ferry Terminal	Current, future extension(s) dependent on funding
Sonoma County Transit	Bus Stop Improvements	Countywide	Current
Sonoma County Water Agency	Sonoma Booster Pump Station Upgrade	East Santa Rosa at SR 12	Through 2019
	Kawana to SBS Pipeline – Phase 1	East Santa Rosa between Ralphine Tanks and Sonoma Booster Pump Station	Through 2026
	Russian River-Cotati Intertie Cathodic Protection	8-10 locations and 16 test stations between Russian River and West Sierra Avenue near Cotati	Through -2020
	Capri Creek Flood Capacity and Habitat Enhancement	Capri Creek, Petaluma	Through 2017
	Denman Reach Flood Terrace	Petaluma River, Denman Reach	Through 2017
	Capital Replacements, Penngrove Sanitation Zone	Penngrove, north of Petaluma	Through 2024
	Sonoma Valley CSD Collection System Creek Crossings	Sonoma, Sonoma Valley	Through 2021
	Sonoma Valley CSD Collection System Replacement and Rehabilitation	Sonoma, Sonoma Valley	Through 2024
	Sonoma Valley CSD Reline Equalization Ponds	Sonoma, Sonoma Valley	Through 2019
	Sonoma Creek Bank Repair	Glen Ellen, south of Kohler Creek confluence	Through 2020
	Sonoma Trunk Sewer Replacement MH90-3 to MH 136-5	Sixth Street West to Happy Lane	Through 2020
Sonoma (city)			
City of Sonoma Department of Public Works	West Napa Street Water System Replacement	West Napa Street between Broadway and Sonoma Highway (SR 12)	Through 2018
	2017 Street Rehabilitation & Water Services Replacement	Avenue Del Oro between Fifth Street East to Cordilleras Drive, Arueo Court, and El Nido Court	Through 2018

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
CURRENT AND ONGOING PROJECTS (cont.)			
Sonoma (city) (cont.)			
City of Sonoma Department of Public Works (cont.)	Pavement Preservation Program	Fifth St. West, Arnold Drive, Adobe Rd. Bucks Rd.	Through 2018
Petaluma			
Petaluma Transit	Transit Signal Priority System	Citywide	Current
Petaluma Department of Public Works	Petaluma Complete Streets	Lakeville Street and East D Street	Current
	Recycled Water Main Extension	Sonoma Mountain Road, Corona Creek to Prince Park	June to October 2017
	Sewer Main Replacement	various	May 2017
	Deer Creek Improvements	Professional Drive at Rushmore and along Rainier Avenue	July 2017
	LED Street Light Replacement	Various all streets (not historic)	2017
	Capri Creek Flood Reduction and Habitat Enhancement	Sunrise Parkway	May to August 2017
	SMART Bike Path	Payran Street to Southpoint Boulevard	Funded 2018-2019
Napa County			
Caltrans District 4	Huichica Creek Bridge Replacement & Fish Passage Project	SR 12/121 approx. 4 miles southwest of Napa	September 2017
	Capell Creek Bridge Replacement Project	SR 121 approx. 8 miles northeast of Napa	May 2017
	SR29 Napa River Bridge Replacement Project	SR 29 in downtown Calistoga	January 2015
	Soscol Junction Improvement Project	Area around intersection of SR 12/29/221 and Soscol Ferry Road	March 2015
	Sarco Creek Pipeline Replacement	Near intersection of SR 121, Silverado Trail, & Trancas Street in Napa	Through 2017
	Troutdale Creek Bridge Replacement	SR 29 1.25 miles south of Napa/Lake County line	Completed
	SR-128 Roadway Retaining System	SR 128 approx. 2 miles southwest of Lake Berryessa	June 2014
Napa Valley Transportation Authority	Bus Stop Improvements	Countywide	Current
	Napa Vine (Bus) Park & Ride Lots	American Canyon	Undefined
Napa County Public Works	Berryessa Knoxville Road MPM 4.4 2017 Storm Damage Repair Retaining Wall	Berryessa Knoxville Road, northeast of Napa	In Construction
	Fagan Creek Bridge-Devlin Road Extension	Devlin Road over Fagan Creek south of Airport Boulevard, Napa	In Design
	Airport Reconstruction Straighten Taxiway	Napa County Airport	2017-2018
	Airport Rehabilitate Extend 1BL-36R Reconstruct H	Napa County Airport	2017-2018
Napa County Planning, Building and Environmental Services Department	Napa Pipe Project	Intersection of SR 12/29 and SR 221	Undefined
	Napa County Jail EIR	Near Syar Napa Quarry and SR 221	Undefined
	Water Availability Analysis	Unincorporated Napa County	Undefined
	Napa Storage and RV	1111 Soscol Ferry Road at Devlin Road	Undefined

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
CURRENT AND ONGOING PROJECTS (cont.)			
Napa County (cont.)			
Napa Sanitation District	Browns Valley Trunk Interceptor	Browns Valley, west Napa	Through 2019
	WRF Main Plant, Line Recycled Water Reservoir	Internal to WRF	Through 2017
American Canyon			
City of American Canyon Parks & Recreation Department	Bay Trail South	Sacramento-Wilson Avenue from White Slough Trail to Lighthouse Drive	2017-2020
	Newell Open Space	7000 Newell Drive	2017-2020
City of American Canyon Transportation Department	SR 29 Signal Interconnect	SR 29, Citywide	2017-2018
	Green Island Road Reconstruction and Widening Project	Green Island Road	2017-2019
	East American Canyon Road Sidewalk	East American Canyon Road	2017-2018
	Donaldson Way Sidewalk Gap Closure	Donaldson Way	2017-2018
	Annual Pavement Management Project	Citywide	Current
	SR 29/Napa Junction Road Intersection-Phase 2	SR29/Napa Junction Road	2017-2018
City of American Canyon Public Works Department	Wastewater System SCADA	WWTP	2017-2018
	SS2 Napa Logistics	Green Island Road	2018-2019
	Water Reclamation Facility EQ Basin	WRF	2017-2018
	SS4 Broadway	American Canyon Road to SR 29 PG&E Substation	2017-2018
	SS6 Theresa Ave and Los Altos Dr.	Theresa Avenue	2017-2018
	Inflow/Infiltration Reduction Project	Citywide	2017-2018
	SR29-SS4 to Crawford Way	SR29 to Crawford Way	2017-2018
	W2 and W3 Annual Water Service Replacements	Citywide	Current
	Napa Junction Detention Basin Landscaping	SR 29/Napa Junction Road	2017-2019
	Citywide Trash Capture Devices	Citywide	2017-2018
Caltrans District 4	Dan Wilson Creek Bridge Deck Replacement	Cordelia, near I-80	June 2016
	I-80/I-680/SR 12 Interchange	Cordelia	Underway
	Sonoma Boulevard (SR 29) Road Diet	Vallejo between York Street and Kentucky Street	2017-2018
Solano County Department of Public Works	Cordelia Hills-Sky Valley Pedestrian Access	American Canyon Overpass	Current
Vallejo			
City of Vallejo Department of Public Works	Montecello Pipeline Project	Lake Berryessa to Fleming Hill WTP, Napa & Solano Counties	Current
	Street paving	Citywide	2017-18

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
RECENT PROJECTS			
Marin County			
Marin County Flood Control and Water Conservation District	Novato Creek Flood Control Dredging Project	Novato Creek from Diablo Avenue to SMART tracks, Novato	Completed 2016
Central Marin Sanitation Agency	Effluent Storage Pond Upgrade	CMSA plant, San Rafael	2014
	Reclaimed Water System Improvements (Design)	CMSA plant, San Rafael	2012
	Effluent Storage Pond Drain Improvements	CMSA plant, San Rafael	2012
Las Gallinas Valley Sanitary District	Recycled Water Treatment Facility	Smith Ranch Road, San Rafael	2012
San Rafael			
City of San Rafael Community Development Department	Target Store	125 Shoreline Parkway	Completed 2015
Larkspur			
City of Larkspur	Rose Garden Project	Rose Lane	Completed
Novato			
City of Novato Department of Public Works	Olive Avenue Improvements Phase III	Novato, between Redwood Highway and SMART crossing	Completed
	Rush Creek Drainage Improvements	Novato, at Olive Avenue and SMART crossing	Completed
	Storm Drain Improvements FY 14/15	Citywide	Completed
Sonoma County			
Caltrans District 4	SR 12 Roadway Safety Improvement Project	SR 12 between Brush Creek Road and Farmers Lane/4th Street in Santa Rosa	May 2016
	US 101 Wilfred Avenue Interchange	US 101 at Wilfred Avenue/Gold Course Drive in Rohnert Park	Completed
	US 101 East Washington Street Interchange	US 101 at East Washington Street in Petaluma	Undefined
	US 101 HOV Widening and Improvements Project	Old Redwood Highway in Petaluma to Rohnert Park Expressway in Rohnert Park	Completed
	US 101 HOV Widening and Improvements Project	Steele Lane in Santa Rosa to Windsor Road in Windsor	Completed
	SR 116 (Lakeville Highway)/Pine View Way Intersection Improvements	Southeast Petaluma	Complete
	SR 116 Stage Gulch Road Project	SR 116 midway between Petaluma and Sonoma	Completed
	SR 116 Slope Stabilization Project	SR 116 (Stage Gulch Road) approx. 5 miles southeast of Petaluma	February 2014
Napa County			
Caltrans District 4	SR 12 Jameson Canyon Road Widening/SR 12/29 Interchange Project	SR 12 between Napa County Airport and I-80	Completed
	I-80 Eastbound Cordelia Truck Scales Relocation	I-80 in Cordelia/Fairfield west of Chadbourne Road	Completed

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
RECENT PROJECTS (cont.)			
Napa County (cont.)			
Napa Sanitation District	MST Recycled Water Pipeline	MST area, east of Napa	Through 2016
	Los Carneros Water District Recycled Water Storage	Stanly Ranch and points west	Through 2016
Napa (city)			
City of Napa Public Works Department	Highway 221 Transmission Main Upgrade	SR 221 from Napa Valley College to Kaiser Road, east Napa	April 2012
	Edward I. Barwick Jameson Canyon WTP Improvements Project	Supply citywide	September 2011
American Canyon			
City of American Canyon Parks & Recreation Department	Southern Vine Trail Gap Closure		Completed
Solano County			
Caltrans District 4	Redwood Parkway-Fairgrounds Drive Improvement	I-80/Redwood Parkway interchange in Vallejo	June 2015
Solano County Transit	Bus Maintenance Facility Renovation	Broadway in Vallejo	Completed 2015
Vallejo			
City of Vallejo Department of Public Works	Highway 12 Mains Relocation & Jameson Canyon Unit 7 Pump Replacement	SR 12 west of I-80	Completed
FORESEEABLE FUTURE PROJECTS			
Multi-Agency			
	Highway 37 Improvement Plan	Novato to Vallejo	Undefined
Marin County			
Caltrans District 4	Various guardrail installation and improvement projects	Countywide	2019-2020
Golden Gate Bridge, Highway and Transit District	Fixed Guideway Connectors	Larkspur and Sausalito Ferry Terminals	Undefined
	Larkspur Ferry Terminal Parking Garage	Larkspur	Undefined
	Facilities Rehabilitation (Bus)	Novato	Undefined
	Ferry Channel and Berth Dredging	San Francisco Bay near Larkspur and Sausalito Ferry Terminals	Undefined
	Golden Gate Bridge Seismic Retrofit Phase 3B	Golden Gate Bridge/US 101	2016-2020
	Golden Gate Bridge Suicide Deterrent Safety Barrier	Golden Gate Bridge/US 101	2016-2018
Transportation Authority of Marin	US 101/Greenbrae Interchange Corridor Improvements	Larkspur/Corte Madera	2017-2018
	US 101 HOV Lanes Marin-Sonoma Narrows (Marin)	SR 37 in Novato to Old Redwood Highway in Petaluma	Beyond 2020
Marin County Department of Public Works	Sir Francis Drake Boulevard Repaving	US 101 to Ross	2020
Marin County Flood Control and Water Conservation District	San Anselmo Flood Risk Reduction Project	San Anselmo and Fairfax	Undefined
	Ross Valley Watershed Flood Risk Reduction Program	Ross Valley, from Fairfax east to mouth of Corte Madera Creek in Larkspur	Undefined
	Novato Levee Repair and Deer Island Basin Improvement	Novato, east of Rowland Boulevard	2018-2019

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
FORESEEABLE FUTURE PROJECTS (cont.)			
San Rafael			
City of San Rafael Department of Public Works	San Quentin Pump Station (stormwater)	1597 East Francisco Boulevard	2019-2020
	Third Street and Grand Intersection Improvements	Third Street and Grand Avenue, east of US 101	2018-2019
	Bellam/Andersen Intersection Improvements	Bellam Boulevard at Andersen Drive, near US 101/I-580 interchange	2019-2020
	Second Street to Andersen Multi-Use Path	Parallel to SMART tracks	2018-2019
Corte Madera			
Town of Corte Madera	Budget Inn Renovation	706 Meadowsweet Drive	2018
	Corte Madera Inn Rebuild Project	56 Madera Boulevard	2018
	Scandinavian Designs	41 Tamal Vista Boulevard	2019
	Village Expansion Project (Restoration Hardware)	1618 Redwood Highway	2018
	Mixed Use Building	200 Nellen Avenue	Undefined
Larkspur			
City of Larkspur	Larkspur Landing Circle	Larkspur Landing Circle off Sir Francis Drake Boulevard	Undefined
City of Novato			
City of Novato Department of Public Works	Rule 20A Underground Utilities, Olive Avenue	From Rosalia Drive east to City limits	2020-2022
City of Novato Community Development Department	Bahia Heights (residential)	End of Misty Court	Undefined
	Bahia River View (residential)	East of Cerro Court, west of Topaz Drive	Undefined
	Hamilton Square (residential)	970 C Street	2018-2019
	Hanna Ranch Mixed Use	End of Rowland Boulevard south of Vintage Way	Undefined
	Hangar 8 at Hamilton Landing	8 Hamilton Landing	Undefined
	North Bay Children's Center	932 C Street	Undefined
	Hamilton Cottages	Senior Housing Triangle on Hamilton Parkway	Undefined
	Hamilton Hospital Assisted Living and Memory Care Facility	516 Hospital Drive	Undefined
	Novato Village	801 State Access Road	Undefined
Sonoma County			
Sonoma County Water Agency	Adobe Creek Sediment Basin Design	Adobe Creek, Petaluma upstream of Casa Grande Road	2020
	Kelly Creek Sunnyslope Avenue Flood Control in Channel	Petaluma	2020
	Petaluma River (Corona Reach) Overflow Chl FS	Petaluma, west side of US 101 from Corona Road overpass south along railroad ROW and Capri Creek-Petaluma River confluence	2020
	Washington Creek Repair and Enhancement	Washington Creek, Petaluma	2020

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
FORESEEABLE FUTURE PROJECTS (cont.)			
Sonoma County (cont.)			
Caltrans District 4	Lakeville Highway Striping	South of Petaluma between SR 116 and SR 37	2018-2019
	US 101 Hearn Avenue Interchange Project	US 101 south of SR 12 interchange in Santa Rosa	2019
North Bay Ferry Service	Ferry Service to Port Sonoma	SR 37 near Lakeville Highway	Undefined
Sonoma County Transportation Authority	US 101 Marin/Sonoma Narrows (Sonoma)	SR 37 in Novato to Old Redwood Highway in Petaluma	Beyond 2020
	SR 116/121 Intersection Improvements	SR 116/121 approx. 4 miles south of Sonoma	Beyond 2018
Sonoma County (General)	Fire Garage (Volunteer)	Lakeville, San Antonio, Petaluma	Undefined
Sonoma County Regional Parks	Bay Area Ridge Trail	Petaluma to North Sonoma Mountain	Undefined
	Calabazas Creek Preserve	Eastern Sonoma Valley	Undefined
	Ernie Smith Community Park Renovation, Bridge Placement	SR 12, Sonoma Valley	2019-2020
City of Sonoma Planning Department	Oliva Apartments: 30 unit complex (4 buildings on 1.5 acres)	655 West Spain Street	2018-2019
	Gateway Mixed Use Project	870 Broadway (SR 12)	Undefined
	Altamira Apartments Project	20269 Broadway (SR 12)	2018-2019
	Sonoma Hotel	153 West Napa St. and 541 First St. West.	2018-2019
	First Street East Project	216, 226, 254 First Street East, 273-299 Second Street East	Undefined
	Taub Apartments	19410 Sonoma Highway (SR 12)	Undefined
City of Sonoma Department of Public Works	Chase Street Bridge Project	Chase Street over Nathanson Creek between Broadway and Austin Avenue	2018-2020
	Fryer Creek Pedestrian Bridge & Bicycle Project	Newcomb Street from Fryer Creek to Fryer Creek Drive	2020
Petaluma			
Petaluma Department of Public Works	SMART Bike Path	Payran Street to Southpoint Boulevard	2018-2019
Napa County			
Napa County Department of Public Works	Airport Boulevard Rehabilitation	North of American Canyon between SR 29 and Napa County Airport	Beyond 2020
Napa County Planning, Building, & Environmental Services	Sheehy Industrial Building	Devlin Road, north of Airport Boulevard	Beyond 2018
	NOVA Warehouse Facility	Napa County Airport Industrial Park	Undefined
	Napa Airport Self Storage	Delvin Road and Sheehy Court	Undefined
Napa Valley Transportation Authority	Vine Transit Bus Maintenance Facility	Sheehy Court at Napa County Airport	Undefined
	Vine Transit Express Bus Corridor	Napa County to El Cerrito, Vallejo, Suisun/Fairfield, Sonoma, & SMART Stations	Undefined

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
FORESEEABLE FUTURE PROJECTS (cont.)			
Napa County (cont.)			
Napa Sanitation District	Siphon Rehabilitation #3 – Milliken Creek		2017-2018
	WRF Main Plant Pond 1 Dredging	Internal to WRF	2017-2019
	WRF Main Plant Headworks and Primary Treatment Improvements	Internal to WRF	2017-2019
	WRF Main Plant Second Digester and Aeration Basin Expansion	Internal to WRF	2020-2023
Napa (city)			
City of Napa Community Development Department	Napa Oaks II	3095 Old Sonoma Road, west Napa	Undefined, 4-year duration
	Vista Tulocay Apartments	467 Soscol Avenue, east Napa	Undefined
	Trinitas Mixed Use Project	Napa Valley Commons Corporate Park, SR 221 & Napa Corporate Way	Undefined
American Canyon			
City of American Canyon Public Works Department	Eucalyptus Drive Realignment/Complete Streets	West of SR 29 from Theresa Road to SR 29	Beyond 2018
	Delvin Road Segment H and Vine Trail Extension	American Canyon between Tower Road and Green Island Road	2017-2018
	SR 29 Widening to 6 Lanes, Intersection Improvements, & Utility Undergrounding	SR 29 Corridor throughout city.	2021-2022
	Commerce Drive Extension	Commerce Drive	2021
	Eucalyptus/Commerce Intersection	Eucalyptus/Commerce	2021-2022
	Paoli Loop Road Widening	Paoli Loop Road	2021-2022
	Newell Drive Extension	Donaldson Way to South Napa Junction Road	2021-2022
	South Napa Junction Road Extension		2021-2022
	Main Street Extension		2021-2022
	Traffic Calming Program	(citywide)	2021-2022
	Class II Bikeways	(citywide)	2021-2022
	Walsh Creek - Enlarge Channel East of SR 29	Flosden Road	Undefined
	American Canyon Creek (various)	American Canyon Creek	2021-2022
	North Slough Culvert from Napa Junction School	SR29 at Napa Junction	2021-2022
	Rio Del Mar Channel Storm Drain Improvements		2021-2022
	Corporation Yard Relocation	TBD (possibly to WRF)	2021-2022
	SS4 Broadway	Crawford to Donaldson Way	2018-2019
	SS6 Theresa Ave. (VI reduction)	Theresa Ave and Los Altos	2019-2021
	WRF Emergency Power Upgrade	WRF	2019-2020
	SS5 Summerfield Project	Westpark, Independence Drive, and Cartagena Way	2021-2022
	SS1 Rio del mar Basin (VI Reduction)	Rio del Mar between Los Altos Drive and Rio Grande	2021-2022

TABLE 4-1: PLANNED AND APPROVED PROJECTS IN THE NBWRP PHASE 2 AREA AND VICINITY (CONTINUED)

Jurisdiction	Project	Area Affected	Status
FORESEEABLE FUTURE PROJECTS (cont.)			
American Canyon (cont.)			
City of American Canyon Public Works Department (cont.)	Main Zone 1A PRV Rehabilitation	SR 29 near Banbury Way, intersection of Elliot Drive and Folland Drive	Not funded
	W5 Devlin Road Extension	Devlin Road	2019
	Sludge Press/ Tanks	WRF	2019
	W6 & W7 Watson Ranch Main Zone	Watson Ranch (east of SR 29)	2019-2021
	W4 High Pressure Zones	American Canyon Road and Newell Drive	2020-2024
	W1 Zone 1 Storage	East of Newell Drive and north of American Canyon High School	Undefined
	W8 Replace Transmission Mains Near SR 29	Near SR 29	2022-2024
	W9 Replace Oat Hill Transmission Main	Napa Junction Road/Eucalyptus Drive	2025
	W9 Replace Transmission Main	WTP to Watson Lane	2021-2022
	W11 Fire Flows in Hess Drive	Hess Drive	2021-2022
	W12 Zone 1 Storage at WTP	WTP	2021-2022
	Airport Boulevard Water Main	Napa County Airport	2021-2022
	Community Center and Permanent Library	60 Benton Way	2021-2022
City of American Canyon Park & Recreation Department	River to Ridge Trail	SR 221 and Streblow Drive	2021-2022
	Silver Oak Trail	American Canyon Road &Newell Drive	2021-2022
	Railroad Path Trail		2021-2022
	Entrada Trail		2021-2022
	SF Bay Trail	Wetlands Edge Road	2021-2022
Solano County			
Caltrans District 4	Sonoma Boulevard (SR 29) Road Diet	Vallejo between York Street and Kentucky Street	2017-2018
Solano County Department of Public Works	Solano 360 – Solano County Fairgrounds Development Project	Vallejo, 1-80/SR 37	Through 2028
Vallejo			
City of Vallejo Department of Public Works	I-80/American Canyon Road Overpass Improvement	I-80 east of Vallejo	Beyond 2019
	Bay Trail/Vine Trail Gap closure Project	Vallejo, north of SR 37	2017-2020
City of Vallejo Economic Development Department	Fairview at Northgate	Vallejo, 1-80/SR 37	Undefined
	Vallejo Marine Ocean Terminal	790-800 Derr Avenue	Undefined
	Lennar Homes 8B North, 8C, & 8D Subdivisions	Mare Island	Undefined

SOURCE: Compiled by ESA, 2018.

4.2.5 Description of Cumulative Projects

North Bay Water Reuse Project Phase 1

The NBWRP Phase 1 expanded recycled water programs within each of the Member Agency service areas. NBWRP Phase 1 included installation of approximately 46 miles of new pipeline, construction of facilities onsite at the existing WWTPs to provide an additional 6.4 mgd of tertiary treatment capacity, and development of approximately 65 acre-feet of new storage, primarily at existing or planned storage ponds at the WWTPs. Phase 1 provides 3,737 AFY of new recycled water for irrigation use and 5,825 AFY for habitat restoration at the Napa Salt Ponds.

Impacts Identified

Impacts identified for the NBWRP Phase 1 include short-term impacts associated with construction, including short-term mitigable impacts to geology and soils, water quality, agriculture, air quality, biological resources, transportation, hazardous materials, noise, and aesthetics. Long-term mitigable impacts were identified to geology and soils, groundwater, biological resources, cultural resources, surface hydrology, energy, noise, hazardous materials, aesthetics, environmental justice, biological resources, and cumulative effects. Potential growth inducement impacts related to NBWRP's contribution to potential secondary effects of growth associated with development under the approved General Plans within the region was found to be the sole significant, unavoidable impact of NBWRP Phase 1.

Relationship to NBWRP Phase 2

The NBWRP Phase 1 project has been completed and the NBWRP Phase 2 would construct additional facilities to distribute recycled water. Construction and operation of the NBWRP Phase 2 would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water resource infrastructure, including the NBWRP Phase 1. The NBWRP Phase 2's potential contribution to these cumulative impacts is further discussed in **Section 4.3**, *Description of Cumulative Effects*.

Marin Area Projects

Bel Marin Keys Unit V (BMKV) Wetland Restoration Project – Phase I

The Phase 1 Project would occur on 906 acres of state-owned BMKV property that has been farmed for at least the past 33 years, and has subsided approximately 9-10 feet. The Phase 1 Project includes construction of a new outboard levee ("New Bayfront Levee"). The New Bayfront Levee would be approximately 11,800 linear feet in length, extending in a north-south alignment from the existing levee along Novato Creek's southwestern bank in the north to the existing N1 levee separating the HAAF parcel and BMKV parcel in the south. Material for the New Bayfront Levee would be sourced from the Project site; no levee fill material would be imported, although specialized fill for wetland features may be imported. The volume of material required to construct the levee is estimated at 1.8 million cubic yards (cy) of material (1.4 million cy compacted). In addition to the New Bayfront Levee, the Phase I Project includes creation or enhancement of approximately 25 acres of seasonal wetlands on the Project site. Wetland restoration efforts would focus on creation of shallow seasonal depressional wetlands and enhancement of alkali meadow wetlands. To accommodate the New Bayfront Levee's tie-in to the N1 levee, the project includes modifications to a segment of an existing NSD effluent outfall pipeline. The proposed New Bayfront Levee alignment would bisect several existing agricultural ditches and obstruct flow of surface runoff from the landside of the proposed New Bayfront Levee alignment. To provide continued access to two power transmission towers owned and operated by the Pacific Gas & Electric Company (PG&E), the Phase I Project includes construction of a permanent access road within the existing PG&E easement on the northern end of the Project site, west of the New Bayfront Levee and south of Novato Creek. Subsequent phases of the BMKV Wetland Restoration Project are reasonably foreseeable, but not presently in the active planning stages, and so are not expected to overlap in time with the construction of other known cumulative projects (i.e., 5-10 years).

Impacts Identified

Impacts identified for the Bel Marin Keys Phase 1 project include short-term construction related impacts associated with grading and installation of the New Bayfront Levee, including short-term impacts to geology and soils, water quality, air quality, biological resources, noise, and aesthetics. Long-term beneficial impacts related to tidal enhancement, surface hydrology, biological resources, and significant unavoidable impacts related to methylmercury formation were identified as part of the larger BMKV Wetland Restoration Project, but would not occur as part of the Phase I Project.

Relationship to NBWRP Phase 2

The Novato SD Wetland Turnout, which is included in the Proposed Action, has been developed in coordination with the Bel Marin Keys Phase I project. The Novato SD effluent outfall pipeline would be modified during construction of the New Bayfront Levee and its tie-in to the existing N1 levee. This would require relocation of approximately 1,000 feet of the Novato SD effluent outfall pipeline. This modification provides the opportunity to install the proposed turnout in a coordinated fashion that would limit cumulative impacts at this location. Therefore, the NBWRP Phase 2 impacts would not be considered to be cumulatively considerable.

Marin Municipal Water District Desalination Project

The Marin Municipal Water District (MMWD) conducted a Seawater Desalination Pilot Study and produced an Engineering Report that examined the potential for developing a desalination facility to address drought-related drinking water supply issues. The report included cost estimates and design criteria. The Final EIR for the Desalination Project was released by the Marin Municipal Water District in December 2008 and certified by the Board of Directors February 4, 2009[1]. The proposed Desalination Project would have been comprised of raw water intake, pretreatment system, a reverse osmosis system, disinfection, brine disposal, and delivery infrastructure. The desalination plant, which could supply up to 15 mgd, would have been located in San Rafael. "Raw water" or "feed water" from San Rafael Bay was to be collected through an intake at the end of the proposed refurbished Marin Rod & Gun Club pier near the Richmond-San Rafael Bridge.

Impacts Identified

The EIR identified two significant impacts that would occur as a result of project implementation. Short-term construction activities would inevitably cause temporary increased ambient noise, even with mitigation including limiting construction to daytime hours, using equipment with mufflers, locating power generators away from sensitive receptors, and providing notification of construction schedules. Implementation of the project would unavoidably adversely affect the visual character of the San Quentin Ridge, however mitigation measures require consultation with a landscape architect to develop a landscaping plan to reduce the visual contrast between the facility and the ridgeline. The MMWD Desalination Project EIR cumulative impact analysis determined that this project would not contribute to cumulatively considerable impacts.

Relationship to NBWRP Phase 2

After the Final EIR was certified in 2009, the document faced legal challenge. The California Appellate Court upheld the document in 2013, and the State Supreme Court did not take up the appeal (MMWD, 2017). Water demand dropped in the MMWD service area such that planning and development of the proposed facility was halted by the MMWD Board of Directors. There are no plans to construct the facility, as the need for additional supply has been eliminated through conservation and other water management strategies. Although it remains an option in the 2015 Urban Water Management Plan (MMWD, 2015), it is no longer considered a reasonably foreseeable project for purposes of environmental analysis. Therefore, the impacts summarized above are not considered to be cumulatively considerable when considered with the NBWRP Phase 2.

[1] Although the project itself was approved, which concluded the CEQA process, MMWD has taken no further action on the project.

Sonoma Area Projects

Fish Habitat Flows and Water Rights Project

The objectives of the Fish Habitat Flows and Water Rights Project (i.e., Fish Flow Project) are to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species, and to update the Sonoma County Water Agency's (SCWA) existing water rights to reflect current conditions. The new minimum instream flow requirements proposed by the Fish Flow Project were developed to meet the requirements of the Biological Opinion to improve habitat for threatened and endangered salmonid species.

The National Marine Fisheries Service (NMFS) issued its Biological Opinion (B.O.) for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, SCWA, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed (Russian River Biological Opinion) on September 24, 2008, NMFS's Russian River B.O. concludes that reducing the Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available salmonid rearing habitat in Dry Creek and the upper Russian River, and provide lower, closer-to-natural inflows into the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that would likely support increased production of juvenile steelhead and salmon.

The Russian River Biological Opinion concluded that, in addition to providing fishery benefits, the lower instream flow requirements "should promote water conservation and limit effects on in stream river recreation." The Russian River B.O. concluded that certain permanent changes to the Decision 1610 minimum instream flow requirements may achieve these goals.

To this end, the Fish Flow Project is proposed to change SCWA's management of water supply releases from Lake Mendocino and Lake Sonoma to provide minimum instream flows that will improve rearing habitat for threatened and endangered salmon, as required by the NMFS's Russian River B.O. and CDFW's Consistency Determination, and to update SCWA's existing water rights to reflect current conditions.

Impacts Identified

The Fish Flow Project Draft EIR was released in August 2016, with the public review period closing in March 2017. An errata was issued in January 2017 providing revised water temperature graphics which did not change the EIR's impact findings. The nature of impacts associated with the Fish Flow Project are anticipated to be related to the interim and permanent changes in release patterns from Warm Springs Dam and Coyote Dam to enhance habitat for salmonids, improving conditions for Chinook Salmon, replacing a key measuring requirement, extending SCWA's water right to 2040, and adding to authorized points of diversion. In general, these flow changes are proposed in order to enhance habitat conditions within the Russian River. Flow changes identified in the Russian River Biological Opinion would reduce flow levels during summer months. The Fish Flow Project EIR did not identify any significant but mitigable impacts. Examples of significant unavoidable impacts identified include the following:

1. The Fish Flow Project could contribute to inundation by seiche, tsunami, or mudflow. The Project would potentially increase water elevations in the Russian River Estuary during lagoon conditions when the river mouth is closed or an outlet channel is in place. In the very unlikely event of a tsunami of sufficient magnitude, the Proposed Project may result in increased risk to people and structures from flooding.

2. Changes in minimum instream flow requirements could result in a violation of water quality standards or waste discharge requirements or otherwise degrade water quality relating to biostimulatory substances in the Russian River. Elevated nitrogen and phosphorus concentrations that exceed United States Environmental Protection Agency (USEPA) criteria, along with depressed and supersaturated dissolved oxygen concentrations observed under Baseline Conditions would likely continue under the Proposed Project.

3. Changes in minimum instream flow requirements could adversely affect when water right permit holders may divert water from the Russian River while complying with the minimum bypass flow terms in their water-right permits. Water right permits along the Russian River may have terms that restrict diversions, including a minimum bypass flow rate below which diversions are not authorized. The Proposed Project would result in lower instream flows that could adversely affect when holders of these permits could divert water.

Other cumulatively significant and unavoidable impacts from the Fish Flow Project include the following:

1. Substantially depleting groundwater supplies;
2. Altering the existing drainage pattern of a site resulting in substantial erosion or sedimentation in the Upper Russian River or Dry Creek;
3. Violating water quality standards or waste discharge requirements related to aluminum and specific conductance;
4. Changing minimum instream flows resulting in impacts that inhibit access to recreational activities such as swimming, sunbathing, and boating in Dry Creek and the Russian River; and
5. Having an adverse effect on a scenic vista or degrading the visual character or quality of the Upper Russian River, Lower Russian River, and their surroundings.

Relationship to NBWRP Phase 2

The Fish Flow Project is proposed to address requirements in the Russian River Biological Opinion and to update SCWA's existing water rights to reflect current conditions. All management actions are proposed for implementation within the Russian River Watershed and no facilities would be constructed within the North San Pablo Bay Watershed.

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six treatment facilities. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for non-potable uses to offset the use of potable supplies for those purposes. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation. Therefore, NBWRP Phase 2 would not contribute to direct or indirect impacts that may be associated with modification of Russian River hydrology to benefit listed salmonid species.

Eel River and Potter Valley Project

The Eel River watershed is located in Humboldt, Mendocino, Lake, Glenn, and Trinity counties. The Potter Valley Project, owned and operated by PG&E, is comprised of several main elements: Cape Horn Dam, a diversion tunnel, Scott Dam, Lake Pillsbury, and the Potter Valley Power Plant. The Eel River Power and Irrigation Company constructed the Cape Horn Dam and Van Arsdale Reservoir on the Eel River in Mendocino County in 1908. A diversion tunnel leads from the Eel River to the East Fork of the Russian River and has been used since to generate electrical energy at the Potter Valley Power Plant. Scott Dam was constructed at the headwaters of the Eel River, forming Lake Pillsbury. Water is released from the lake to the Eel River, then re-diverted downstream at Cape Horn Dam to the Potter Valley Power Plant through the diversion tunnel. The water continues through the East Fork of the Russian River to Lake Mendocino.

During the summer and fall months, water in the Russian River downstream of Coyote Valley Dam and above Dry Creek is derived from releases stored in Lake Mendocino, some of which is derived from Eel River water via the Potter Valley Project. The Federal Energy Regulatory Commission (FERC) regulates interstate transmission of electricity, natural gas, and oil, and licenses hydropower projects. FERC also has exclusive jurisdiction to establish instream flow standards on federally-licensed hydroelectric projects and has primary authority to review the Potter Valley Project (PVP) instream flow requirements in the Eel River. The quantity

of water PG&E can divert to the Potter Valley Power Plant is limited by PG&E's FERC license which expires in 2022; PG&E has initiated relicensing proceedings.

Relationship to NBWRP Phase 2

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six treatment facilities. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for non-potable uses to offset the use of potable supplies for those purposes. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation. Therefore, the NBWRP Phase 2 would not contribute to direct or indirect impacts that may be associated with current operations or future modification of the Potter Valley Project operations.

Construction and operation of NBWRP Phase 2 elements would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water resource infrastructure within the San Francisco Bay Area Air Basin. However, the Potter Valley Project is located outside of the San Francisco Bay Area Air Basin. Therefore, implementation of the NBWRP Phase 2 would not have the potential to contribute to cumulative effects related to this project.

Recycled Water Projects

City of Santa Rosa Subregional Urban Water Reuse System

The City of Santa Rosa has implemented the Santa Rosa Subregional Urban Water Reuse System, which provides sewage disposal and treatment, recycled water storage, conservation, recycled water reuse and/or disposal, industrial waste pretreatment, and infiltration and inflow reduction. The existing Subregional Urban Water Reuse System encompasses a large portion of Sonoma County, including the cities of Santa Rosa, Rohnert Park, Cotati, and Sebastopol, as well as Alexander Valley, Dry Creek Valley and the Russian River from Mirabel to north of Healdsburg.

Under the Santa Rosa Subregional Urban Water Reuse System, the City of Santa Rosa currently uses recycled water that is tertiary treated at the Laguna Wastewater Treatment Plant, to irrigate cropland, golf courses, playgrounds, pasture, and parks. The current reuse program produces 7,000 acre-feet of discharge annually (City of Santa Rosa, 2008). Adoption of Resolution No. 25337 authorized the revision of the Water Reuse Program that would allow the City to commit excess recycled water to other beneficial uses. Since current wastewater is treated to a tertiary level and there exists an excess of water that would otherwise be discharged, the City of Santa Rosa has identified opportunities and developed and updated the City's Recycled Water Master Plan to allocate future reuse of recycled water for beneficial purposes.

The Recycled Water Master Plan is part of the Incremental Recycled Water Program (IRWP). In 2007, the City of Santa Rosa released the Draft Environmental Impact Report for the IRWP which analyzed potential significant impacts associated with implementation of the IRWP Recycled Water Master Plan. The purpose of the IRWP is to provide reliable treatment, recycling, reuse, and disposal of wastewater volume from growth anticipated in local General Plans. The DEIR analyzes the six elements of the IRWP which include conservation, infiltration and inflow reduction, urban reuse, agricultural reuse, Geysers expansion, and discharge. Implementation of all program elements was anticipated to provide up to 17,560.4 AFY of recycled water for beneficial reuse annually (City of Santa Rosa, 2007). The urban reuse element would require increased capacity at the Laguna Plant in order to provide recycled water for existing irrigation sites. Under the Plan, a dual recycled water system would be installed in new development to supply recycled water for industrial or non-potable processes. Pipelines would extend from the Laguna Plant to an urban reuse area. Approximately 1,800 MG of additional storage would be required for full implementation. It is estimated that the urban reuse element could utilize 6,446 AFY of recycled water per year. The agricultural reuse element would also require capacity upgrades at Laguna Plant to provide recycled water for crop irrigation and frost

control in the North County and east of Rohnert Park. A pipeline would extend from the existing Geysers Pipeline to the Alexander Valley, Dry Creek Valley, and Russian River irrigation areas. The Plan would require 1,200 MG of storage to support irrigation in areas east of Rohnert Park and 2,900 MG storage to support irrigation in the Alexander and Dry Creek Valleys. It is estimated that the agricultural reuse element could accommodate growth of recycled water flows up to 6,400 billion gallons.

Impacts Identified

The IRWP EIR determined that components of the conservation, infiltration and inflow elements would be affected by ground rupture, but would not cause significant adverse impacts to other resources. After mitigation, all elements would have a less than significant impact on surface water quality, public health, biological resources, and wetlands. However, the IRWP EIR determined that implementation of the urban reuse, agricultural reuse, Geysers expansion, and discharge elements of the IRWP would contribute to significant and unavoidable environmental impacts on transportation, noise, air quality, land use, cultural resources, and visual resources. Transportation impacts would be limited to the construction period. Operation of all components would contribute to an increase in $CO2^2$ emissions, as well as increased noise. Upgrades at the Laguna Plant would significantly impact air quality by producing objectionable odors and emitting greenhouse gases. The direct discharge facility, advanced membrane treatment facility, storage facilities, and pump stations would be inconsistent with existing land use designations, and in some cases, particularly under the Agricultural Irrigation element that would be implemented in the City of Healdsburg, incompatible with adjacent land uses. The IRWP EIR determined that, if implemented in conjunction with other projects, there would be a cumulative impact on land use, due to facilities that would be inconsistent with existing land use designations. Storage facilities, in particular, would impact the visual character of the area. When considered with other projects, the IRWP would cumulatively degrade groundwater quality in existing and future wells, which could be hazardous to the public. Similarly, the drawdown of groundwater due to interception of baseflow by reservoirs is a localized impact that could be cumulatively considerable if other entities proposing reservoirs for either recycled water or potable water storage also intercept baseflow to reduce groundwater recharge.

Relationship to NBWRP Phase 2

The Santa Rosa Subregional Urban Water Reuse System is proposed to provide recycled water facilities within the Santa Rosa area. The total flow to be managed by the Subregional System is estimated to be 17,560.4 AFY. Implementation of the program would be anticipated to provide a potable offset of 17,560.4 AFY, thereby providing a beneficial impact by reducing demands on Russian River supplies. All proposed facilities are within the Russian River Watershed, and no facilities would be constructed within the North San Pablo Bay Watershed.

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six treatment facilities. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for non-potable uses to offset the use of potable supplies for those purposes. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation. As such, it would have a beneficial effect by reducing irrigation demands on the Russian River system, and would expected to contribute to the beneficial impacts identified for the Santa Rosa Subregional Urban Water Reuse System. This beneficial effect would also be applicable to groundwater and local surface water supplies that are currently used for irrigation. Therefore, when considered with other recycled water programs within the region that would offset potable water demands on Russian River supplies, the NBWRP Phase 2 would contribute to a cumulative beneficial impact.

Construction and operation of the NBWRP Phase 2 would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water resource infrastructure within the San

2 NBWRP Phase 2: Carbon Dioxide Emissions.

Francisco Bay Area Air Basin. The NBWRP Phase 2's potential contribution to these cumulative impacts is further discussed in **Section 4.3**, *Description of Cumulative Effects*.

Regional Plans

North Coast Integrated Regional Water Management Plan

The North Coast Integrated Regional Water Management Plan (IRWMP) was adopted in 2007, and updated with Phase III in 2014, to coordinate seven counties and approximately 70 partnering entities and implement basin scale water management strategies. The North Coast Region covers all of Del Norte, Humboldt, Trinity and Mendocino counties, major portions of Siskiyou and Sonoma counties and small portions of Glenn, Lake, Modoc and Marin counties. The plan provides guidance for future planning and management of North Coast waterways, including the Russian River. The objectives of the plan include conservation and enhancement of salmonid populations by protecting habitat and water quality, protect drinking water to ensure safety of public health, address climate change adaptation and energy independence, and provide adequate water supply with minimal environmental impacts, through an interagency and intraregional approach. The plan acknowledges water supply issues and states water recycling for compatible uses may alleviate the North Coast Region's reliance on rainfall. The plan is implemented through a variety of restoration, facility improvement, and erosion control projects.

Relationship to NBWRP Phase 2

Projects implemented under the North Coast IRWMP include water supply and recycled water facilities. Proposed facilities would be constructed outside of the North San Pablo Bay Watershed. Impacts are related to the construction of proposed facilities. Any impacts to water supply, water quality or water resources would occur outside of the North San Pablo Bay Watershed. Recognizing that water supply is imported into the North San Pablo Bay Watershed, some of these projects could affect the availability of water supply within the North San Pablo Bay Watershed.

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six treatment facilities. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for non-potable uses to offset the use of potable supplies for those purposes. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation.

Construction and operation of the NBWRP Phase 2 would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water infrastructure projects proposed under the North Coast IRWMP. However, all of those facilities are located outside of the North San Pablo Bay Watershed and the San Francisco Bay Area Air Basin. The NBWRP Phase 2 would not contribute to other cumulative impacts when considered with water infrastructure improvements occurring outside of the watershed, due to the lack of geographic proximity. The NBWRP Phase 2's potential contribution to cumulative impacts is further discussed in **Section 4.3**, *Description of Cumulative Effects*.

San Francisco Bay Area Integrated Regional Water Management Plan

The San Francisco Bay Area Integrated Regional Water Management Plan (IRWMP), the current edition of which was published in September 2013, provides guidance for future planning and regional management of San Francisco Bay and its tributaries, including San Pablo Bay. The San Francisco Bay Area mirrors the San Francisco Bay RWQCB jurisdiction, which covers all or significant portions of San Mateo, San Francisco, Marin, Sonoma, Napa, Solano, Santa Clara, Alameda, and Contra Costa counties. The objectives of the plan are to protect and improve hydrologic functions, improve water supply reliability, improved regional flood management, protect and improve the quality of water resources, and enhance environmental resources and

habitats. Planning and management challenges arise from the large geographic scope of the region and the diverse water management needs.

Agencies participating in the San Francisco Bay Area IRWMP that are also participants in NBWRP Phase 2 include City of Napa, SCWA, and MMWD. The San Francisco Bay Area IRWMP defines four "Functional Areas" for which a series of objectives, strategies, and projects are identified. The Functional Areas include the quality of water supply, wastewater and recycled water, stormwater management as it relates to flood protection, and habitat protection and restoration as it relates to watershed management. There are approximately 43 IRWMP projects related to wastewater and water recycling, including South Bay Recycled Water Treatment Project, Redwood City Recycled Water Project, and the Pacifica Recycled Water Project, among others. These projects would provide recycled water for potable offset as a means of enhancing surface water quality in the San Francisco Bay and its tributaries, and improving water supply reliability.

Relationship to NBWRP Phase 2

NBWRP Phase 2 would coincide with the various wastewater recycling projects and habitat restoration projects throughout the San Francisco Bay Region. Construction and operation of NBWRP Phase 2 would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water infrastructure projects proposed under the San Francisco Bay Area IRWMP. However, the majority of the water recycling projects is outside of the North San Pablo Bay Watershed; therefore, NBWRP Phase 2 would not contribute to other adverse cumulative impacts when considered with water infrastructure improvements occurring outside the watershed, due to the lack of geographic proximity. In general, concurrent implementation of NBWRP Phase 2 and other IRWMP projects would generate long-term regional benefits for surface water quality and water supply reliability.

Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Plans (GSPs)

Sonoma Valley

In 2007, the Sonoma Valley Groundwater Management Plan Basin Advisory Panel developed the Sonoma Valley Groundwater Management Plan to address the sustainability of local groundwater resources in light of groundwater depletion and increasing demands. The Basin Advisory Panel consists of representatives from SCWA, the City of Sonoma and the Valley of the Moon Water District, as well as members of the public, local business owners, farmers, and environmental interest groups. In 2007, SCWA, City of Sonoma, Valley of the Moon Water District, and the Sonoma Valley County Sanitation District adopted the non-regulatory plan. The Plan identifies management practices, that contribute to the sustainability of groundwater resources for future use for agricultural, industrial, residential, ecological, and recreational purposes to implemented by local agencies to manage, protect, and enhance groundwater resources. Components of the Plan incorporate water quality control, monitoring, public involvement, and regional planning. In response to the Sustainable Groundwater Management Act (SGMA) passage in 2016, a Groundwater Sustainability Agency (GSA) was formed in 2017 through a Joint Exercise of Powers Agreement (JPA) entered into by the City of Sonoma, County of Sonoma, North Bay Water District, SCWA, Sonoma Resource Conservation District, and Valley of the Moon Water District. The GSA has a governing board of six, composed of representatives of each of the JPA member agencies. The GSA is in the process of developing a Groundwater Sustainability Plan (GSP). The development of the GSP will be closely coordinated with neighboring GSAs in the Santa Rosa Plain and Petaluma Valleys, as well as local agencies with land use responsibilities including the City of Sonoma and the County of Sonoma.

Petaluma Valley

In response to the passage of SGMA, the Petaluma Valley Groundwater Sustainability Agency (GSA) was formed in June 2017 through a JPA entered into by the City of Petaluma, County of Sonoma, North Bay Water

District, SCWA, and the Sonoma Resource Conservation District. The GSA has a governing board of nine individuals, composed of representatives of each of the JPA member agencies. The GSA is in the process of developing a GSP. The development of the GSP will be closely coordinated with neighboring GSAs in the Santa Rosa Plain and Sonoma Valley, as well as local agencies with land use responsibilities including the City of Petaluma and the County of Sonoma.

Napa Valley

In response to SGMA, Napa County has prepared a Basin Analysis Report, an Alternative Submittal per the requirements of Water Code Section 10733.6 (b)(3). This analysis of basin conditions demonstrates that the basin has operated within its sustainable yield over a period of at least 10 years. The Napa Valley Subbasin is the only basin in Napa County with a medium priority ranking by DWR that is subject to SGMA at this time. GSPs for high and medium priority basins are required to be completed by January 31, 2022.

The Basin Analysis Report covers the entire Napa Valley Subbasin. While the report analyzes areas outside the Subbasin to determine how those areas affect recharge and runoff in the Subbasin, the areas outside the Subbasin are not subject to SGMA. Since 2008, the County and others' efforts have been instrumental in implementing groundwater management actions to better understand groundwater conditions, establish monitoring to track conditions, conduct education and outreach, and develop other programs to maintain groundwater sustainability. These efforts have included the adoption of Goals and Policies in the 2008 General Plan and creation of the Groundwater Resources Advisory Committee for implementation and community outreach. The Basin Analysis Report for the Napa Valley Subbasin was presented to the Board of Supervisors at a Special Meeting on December 13, 2016. At that meeting, the Supervisors approved the report and its submittal to DWR. The Report was submitted to DWR on December 16, 2016.

Relationship to NBWRP Phase 2

Groundwater Management Planning efforts to meet SGMA requirements in Sonoma and Napa counties are underway and would likely identify recycled water as one of the potential supply sources that could offset groundwater pumping within the area, and would assist in managing the basin for long-term sustainability. It is anticipated that GSPs in the region will identify recycled water as a potential supply source to offset groundwater pumping and manage groundwater levels within their respective basins.

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six WWTPs. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for irrigation uses to offset the use of potable supplies for irrigation. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation.

Construction and operation of the NBWRP Phase 2 would have the potential to contribute to cumulative impacts associated with short-term construction and long-term operation of water infrastructure projects proposed within the North San Pablo Bay Watershed and the San Francisco Bay Area Air Basin. The NBWRP Phase 2's potential contribution to cumulative impacts is further discussed in **Section 4.3**, *Description of Cumulative Effects*.

Other Cumulative Projects

The following projects are summarized to provide a complete spectrum of current, ongoing, and future projects. The project, impacts, and relevance to the project are described below.

Urban and Suburban Construction Projects

There are a variety of suburban and urban residential, commercial, and roadway projects anticipated in the Marin, Sonoma, and Napa County areas (see **Table 4-1**). These are small to moderate scale local projects. In

general, short-term construction impacts and permanent land use alteration, loss of habitat, and traffic impacts are associated with these types of local development projects. These projects are examples of the increase in development and infrastructure that is allowed under the local General Plans. The timing and implementation of these projects is uncertain at this time. However, for certain issue areas such as air quality, traffic, and water resources, these projects would have the potential to contribute to cumulative impacts in the event they are implemented during the construction timeframe of the NBWRP Phase 2.

Impacts Identified

Construction of these projects would be expected to generate significant but mitigable impacts to geology and soils, water quality, biological resources, land use, air quality, noise, traffic, hazardous materials, cultural resources and aesthetics. These impacts would generally be reduced to a less than significant level through mitigation measures established on a project by project basis. However, some of these impacts may remain significant and unavoidable, on a project level and/or cumulative basis.

Relevance to NBWRP Phase 2

Projects constructed within the same timeframe as the NBWRP Phase 2 would have the potential to contribute to cumulative impacts to geology and soils, water quality, biological resources, land use, air quality, noise, traffic, hazardous materials, cultural resources and aesthetics. These impacts would generally be reduced to a less than significant level through mitigation measures established on a project by project basis; however, some of these impacts may remain significant and unavoidable. In the event that construction of these projects coincide with the implementation of NBWRP Phase 2, they would have the potential to contribute, both individually and collectively, to cumulative impacts within the issue areas noted above.

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six WWTPs. The NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for irrigation uses to offset the use of potable supplies for irrigation. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation.

It is anticipated that these projects will be constructed within the North San Pablo Bay Watershed, and within the San Francisco Bay Area Air Basin. Therefore, the NBWRP Phase 2 would have the potential not contribute cumulative impacts when considered with infrastructure improvements occurring within the watershed and airshed. The NBWRP Phase 2's potential contribution to cumulative impacts is further discussed in **Section 4.3**, *Description of Cumulative Effects*.

303 (d) Listing of impaired waterways in Marin, Sonoma, and Napa Counties

Water quality in California is regulated on both state and local levels. Under the Clean Water Act, the US Environmental Protection Agency (USEPA) is responsible for water quality management and has delegated this authority to the State Water Resource Control Board (SWRCB). Section 303(d) of the Clean Water Act requires SWRCB to identify water bodies that do not meet water quality objectives. Each state submits an updated 303(d) list biannually. The list identifies impaired waterbodies, the pollutant or stressor causing the impairment, and establishes a priority for developing a control plan or a Total Maximum Daily Load (TMDL). A TMDL is a program that has been developed to recover 303(d) list waterbodies, and defines the total amount of material a waterbody can regularly assimilate and still maintain water quality at levels that protects beneficial uses designated for that waterbody (SWRCB, 2016) and is further explained below. A water quality control plan and an implementation plan are developed for each water body and pollutant/stressor.

Waterways in NBWRP Phase 2 area are regulated by the San Francisco Bay RWQCB. Rivers and streams located within the NBWRP Phase 2 area in Marin County that appear on the currently applicable 2016 303(d) list of impaired water bodies include San Rafael, Corte Madera, Gallinas, Miller, San Antonio, and Novato

creeks. These creeks are listed for diazinon. Urban runoff and storm sewers are identified as the potential sources of diazinon in San Rafael, Corte Madera, San Antonio, and Gallinas creeks. Miller and Novato creeks are listed for diazinon, but from an unknown source. TMDLs for diazinon were development and put into place in 2006.

Rivers and streams located within the NBWRP Phase 2 area in Sonoma County that appear on the currently applicable 2016 303(d) list of impaired water bodies include Sonoma Creek and the Petaluma River. Sonoma Creek is listed for pathogens, nutrients, and sedimentation/siltation. Potential nutrient sources include agriculture, construction/land development, and urban runoff/ storm sewers. TMDLs for Sonoma Creek were scheduled to be completed by 2013. The Petaluma River is listed for diazinon, nutrients, pathogens, sediment, and trash. TMDLs for the Petaluma River are scheduled to be completed by 2021. The Russian River is listed as impaired by sedimentation and siltation, among other pollutants, as a result of agricultural practices, channel erosion, highway, road, or bridge construction, hydromodification, and a range of other potential sources. Water temperature is also impaired in these streams as a result of erosion, hydromodification, removal of riparian vegetation, and stream bank modification.

The Napa River within the NBWRP Phase 2 area, appears on the currently applicable 303(d) list for nutrients, pathogens, and sedimentation/siltation. The sources of these pollutants are vary by pollutant, and are indicated in Table 3.5-1. TMDLs for the Napa River were scheduled to be completed in 2010. The Sacramento-San Joaquin Delta, the source of surface water imported into Napa County via the State Water Project, is listed as impaired for chlordane, DDT, dieldrin, dioxin compounds, furan compounds, invasive species, mercury, PCBs, and selenium.

Listing of waterways outside of the North San Pablo Bay Watershed would not be anticipated to contribute to cumulative impacts, as these waterways are not tributary to North San Pablo Bay. Recognizing that water supply is imported into the North San Pablo Bay Watershed from the Russian River Basin, listing of both the Russian River and Eel River systems as impaired, and the implementation of additional regulatory measures (including establishment of TMDLs) could alter the water quality of supplies from the Russian River and imported into the NBWRP Phase 2 service area. However, these impacts would be anticipated to be beneficial, as water quality in these systems would be improved.

Impacts Identified

Implementation of TMDLs would be anticipated to address pollutant loading in local water bodies through a number of point-source and non-point-source control measures. The TMDL process is a tool for implementing water quality standards and is based on the relationship between pollutant sources and in-stream water quality conditions. The TMDL establishes the maximum allowable loadings of a pollutant that can be discharged to a water body while still meeting applicable water quality standards. The TMDL provides the basis for the establishment of water quality-based controls. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDLs allocation calculation for each water body must include a margin of safety to ensure that the water body can be utilized for its State–designated uses. Additionally, the calculation must account for seasonal variation in water quality (USEPA 2002).

TMDLs are intended to address all significant stressors which cause or threaten to cause impairments to beneficial uses, including point sources (e.g., urban water discharges), nonpoint sources (e.g., runoff from fields, streets, range, or forest land), and naturally occurring sources (e.g., runoff from undisturbed lands). TMDLs may be based on readily available information and studies. In some cases, complex studies or models are needed to understand how stressors are causing water body impairment. In many cases, simple analytical efforts provide an adequate basis for stressor assessment and implementation planning. TMDLs are developed to provide an analytical basis for planning and implementing pollution controls, land management practices, and restoration projects needed to protect water quality. States are required to include approved TMDLs and associated implementation measures in State water quality management plans. Within California, TMDLs are implemented through RWQCB Basin Plans. The Basin Planning process has been certified as functionally equivalent to, and therefore exempt from, CEQA's requirement to prepare and EIR or a Negative Declaration. The RWQCB's

regulations in Title 23 CCR Section 3775, et. seq., describe the environmental documents required for planning actions. The implementation of TMDLs is anticipated to be largely beneficial to water quality.

Relationship to NBWRP Phase 2

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six WWTPs. NBWRP Phase 2 would recover treated effluent prior to its release, treat that water to Title 22 standards, and distribute it for non-potable uses to offset the use of potable supplies for those purposes. As such, it would have a beneficial effect by reducing supply demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for non-potable activities.

Implementation of NBWRP Phase 2 would reduce the amount of treated wastewater discharged into tributaries of North San Pablo Bay. As previously noted in **Section 3.5**, Water Quality, it is anticipated that this reduction in discharge would have an incremental, but beneficial, effect by reducing the volume of treated wastewater discharged to tributaries of North San Pablo Bay. Therefore, NBWRP Phase 2's contribution to potential cumulative impacts related to water quality in impaired water bodies within the North San Pablo Bay Watershed is considered beneficial.

Implementation of AB 2121 - Policy for Maintaining Instream Flows

The Policy for Maintaining Instream Flows in Northern California Coastal Streams (Policy) establishes principles and guidelines for maintaining instream flows for the protection of fishery resources, while minimizing water supply impacts on other beneficial uses of water, such as irrigation, municipal use, and domestic use. The geographic scope of the Policy encompasses coastal streams from the Mattole River to San Francisco and coastal streams entering northern San Pablo Bay, and extends to five counties: Marin, Sonoma, and portions of Napa, Mendocino, and Humboldt Counties. The Policy applies to applications to appropriate water, small domestic use, small irrigation use, and livestock stockpond registrations, and water right petitions.

The Policy does not establish specific instream flow requirements for particular rivers or streams. Nor does the Policy approve any particular water diversion projects, or specify the terms and conditions that will be incorporated into water right permits, licenses, or registrations. Instead, the Policy establishes guidelines for evaluating the potential impacts of water diversion projects on stream hydrology and biological resources. The Policy includes principles to ensure that new water appropriations and changes to existing water right permits and licenses will not affect the instream flows needed for fish spawning, migration and rearing, or the flows needed to maintain natural flow variability, which protects the various biological functions that are dependent on that variability. The Policy also contains principles to ensure that migration paths to spawning and rearing habitats are not blocked.

The purpose of the instream flow requirements established under this policy is to protect native fish populations and fishery resources. By implementing seasonal limits on diversions, minimum bypass flow requirements, and limits on maximum cumulative diversions rights within a watershed, the policy encourages more natural hydrograph responses, which would be more conducive to the survival of anadromous fish. The State Water Board will consider whether to include enforcement provisions in the AB 2121 streamflow protection policy.

Identified Impacts

It is anticipated that the policy would increase wintertime flow and duration in local streams by requiring a minimum bypass flow at local diversion points. This would have beneficial impacts on biological resources, riparian habitat, fisheries, water quality and water resources.

Relevance to NBWRP Phase 2

Wastewater generated within the North San Pablo Bay Watershed is collected, treated, and discharged to North San Pablo Bay by six WWTPs. The NBWRP Phase 2 would recover treated effluent prior to its release, treat

that water to Title 22 standards, and distribute it for irrigation uses to offset the use of potable supplies for irrigation. As such, it would have a beneficial effect by reducing irrigation demands on Russian River, State Water Project, groundwater, and local surface water supplies that are currently used for irrigation. This includes local surface water supplies that are impounded from streams and used for irrigation. Provision of recycled water by the NBWRP Phase 2 would provide recycled water offset for supplies that may currently be diverted from instream flow. As such, the NBWRP Phase 2 would have a beneficial contribution to cumulative increases in instream flow associated with implementation of AB 2121.

Title XVI Water Reuse Program

The United States Bureau of Reclamation's Title XVI Water Reuse Program, was established in response to droughts for six consecutive years during the 1980s and 1990s in the western United States. Under Title XVI, the Secretary of the Interior is responsible for identifying opportunities for water reuse. The purpose of Title XVI is to supplement the water supply by reclaiming, recycling and reusing water from agricultural drainage, wastewater, or other low quality water supplies. Municipal and irrigation district projects in the seventeen western states are eligible for Title XVI funding. An original rationale was to help Southern California reduce their reliance on Colorado River water. Projects are approved and evaluated on an individual basis, and they are eligible for federal grants for a maximum of $20 million or up to 25 percent of the total project cost, whichever is lower, unless authorized an alternate maximum cost share by Congress. Participation in Title XVI grants the authority to design and construct reclamation and reuse facilities, and deliver water for irrigation, groundwater recharge, wildlife enhancement, industrial, and recreational purposes. This is only the active federal program providing local municipalities and irrigation districts with financial and technical assistance for the design and operation of recycled water facilities. Other funding is available through the Clean Water Act and the Safe Drinking Water Act State Revolving Fund.

Relevance to NBWRP Phase 2

The NBWRP Phase 2 is within the Bureau of Reclamation's Title XVI Program, and as such, is eligible for funding under that program. The Bureau of Reclamation has established guidelines for implementing the Title XVI program and applying it to projects. This process will be used by Reclamation in distributing funds under Title XVI. The level of available funding is established by Congress, and is not unlimited. Therefore, each of the projects that are funded, will, by definition of the Title XVI program, affect the availability of funding for other projects.

In the event other projects are not funded, this could contribute to two general cumulative effects relating to these other projects. First, the construction and operational impacts of these projects would be avoided. Second, the beneficial impacts of these projects, primarily related to offset of potable water supplies through the use of recycled water, would not occur. It should be noted that participation in the Title XVI program by NBWRP Phase 2 does not preclude other projects from being funded under Title XVI, at the discretion of the Bureau of Reclamation and the U.S. Congress. As such, although authorization and appropriation of funds to NBWRA Member Agencies could, by definition, reduce the amount of funding available under the Title XVI for other projects, such appropriations, both individually and cumulatively, are subject to the discretionary action of the Bureau of Reclamation and the U.S. Congress. Therefore, the NBWRA's contribution to this cumulative effects is no less, and no greater, than any other project participating in the program. Therefore, this contribution is not cumulatively considerable.

Appendix 5

Growth Inducement and Secondary Effects of Growth

Recycled Water Use Under NBWRP Phase 2

Novato SD Service Area

Water Supply

Novato SD provides wastewater services in Novato and areas in the vicinity (within Marin County) that receives water supply from NMWD. The sources of water supply for NMWD are the Stafford Lake[1] and imported water from SCWA. **Table A5-1** shows the water supply sources for NMWD that serves the Novato SD service area.

TABLE A5-1: WATER SUPPLY SOURCES FOR NMWD (AFY)

Water Supply Source	2015	2020	2025	2030
Surface water (Stafford Lake)	1,700	1,700	1,700	1,700
Surface water (Imported from SCWA)	7,829	8,926	8,972	9,069
Recycled water (Tertiary treated)	650	650	650	650
Other (Raw water for irrigation)[1]	250	250	250	250
Total	**10,429**	**11,526**	**11,572**	**11,669**

NOTE:

1 Untreated water pumped from Stafford Lake used for irrigation of Stafford Lake Park and Indian Valley Golf Course, value not included in 1,700 acre-feet safe yield. The table does not include the secondary-treated wastewater use for NMWD pastureland irrigation

SOURCE: Marin County, 2007b; NMWD UWMP 2015

Stafford Lake's historical annual yield is 2,000 acre-feet (AF) and the safe long-term annual yield has been determined to be 1,700 AF. As indicated in Table A5-1, the current and projected Stafford Lake water supply has been estimated at its safe long-term yield of 1,700 AFY. Most of NMWD's water supply (about 80 percent) is obtained through an agreement with SCWA that provides water principally from the Russian River.

General Plan Policies

As noted in the Marin County General Plan, the main constraints and limitations to the water supply in the NMWD service area include (Marin County, 2007b):

1. Physical capacity of SCWA's transmission system;
2. Water rights limitations of Novato Creek / Stafford Lake;
3. Groundwater quality and quantity limitations;
4. Drought impacts to SCWA supplies. An extended drought could result in a supply reduction of 30 percent or more; and
5. Legal and environmental impacts to SCWA supplies.

The water supply is adequate to meet the demand under Novato General Plan buildout. Water distribution facilities are developed on a site-by-site basis, financed by the developer through agreements with the water agency (City of Novato, 2003). As part of the Public Facilities policy of water conservation, Novato General Plan (2003) states two programs for the City: Use of treated wastewater for irrigation of City facilities and encourage wastewater irrigation at other public and private facilities, where practicable, and support and

1 Stafford Lake, a reservoir on Novato Creek west of Novato.

encourage reclamation of wastewater for reuse wherever possible in accordance with the regulations and ordinances of the NMWD and MMWD. A third program states considering developing a plan in conjunction with the Novato SD and water districts to promote and maximize to the extent feasible the reuse of treated wastewater and consider enacting an ordinance to have developments provide wastewater distribution facilities in conformance with the General Plan.

Recycled Water Use Under NBWRP Phase 2

As shown in Table A5-1 above, the Marin County General Plan anticipates recycled water use to increase gradually over time. It is projected that by 2030 approximately 1,020 AF of tertiary treated effluent would be used for urban landscape irrigation (Marin County, 2007b).

Table A5-2 below summarizes the amount of recycled water and the service areas identified under each of the NBWRP Phase 2 Alternatives. Under NBWRP Phase 2, approximately 286 AFY would be available for urban use and distribution and 880 AFY would be available for restoration.

TABLE A5-2: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR NOVATO SD SERVICE AREA

Project	No Action Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	0	286 AFY Urban, 40 AFY levee irrigation, 840 AFY wetland enhancement	436 AFY
Areas of recycled water use	--	--	Levees in vicinity of Novato Creek; transitional brackish wetlands at BMK Phase 2.	North and Central Novato UWMP Area

SOURCE: Brown and Caldwell, 2017

SVCSD Service Area

Water Supply

SVCSD provides wastewater services to the City of Sonoma and unincorporated Sonoma County. The SVCSD service area generally corresponds to areas that receive wholesale water supplies from Sonoma County Water Agency (SCWA) via the City of Sonoma. Additionally, some areas are served by Valley of the Moon Water District. As a SCWA retailer, the City purchases water from SCWA, with City wells augmenting that supply during periods of peak use. Policy 1.6 of the Sonoma General Plan (2006) limits growth in Sonoma to a rate that is based on the cost-effective provision of services within the sphere of influence. **Table A5-3** provides the water supply sources for City of Sonoma and Valley of the Moon, and the projected demand under the 2015 Urban Water Management Plan (SCWA, 2015).

TABLE A5-3: WATER SUPPLY SOURCES FOR SCWA (AFY)

Urban Water Agency	2015	2020	2025	2030	2035
City of Sonoma	1,762	2,174	2,210	2,231	2,267
VOMWD	2,528	3,121	3,125	3,111	3,110
Total	**4,290**	**5,295**	**5,335**	**5,342**	**5,377**

SOURCE: Brown and Caldwell, 2017; 2015 UWMPs for each agency.

General Plan Policies

The Sonoma County General Plan lists the following goals and policies that support recycled water use:

1. ***GOAL WR-4*:** Increase the role of conservation and safe, beneficial reuse in meeting water supply needs of both urban and rural users.
2. ***Objective WR-4.1*:** Increase the use of recycled water where it meets all applicable regulatory standards and is the appropriate quality and quantity for the intended use.
3. ***Policy WR-4j*:** Ensure that public wastewater disposal systems are designed to reclaim and reuse recycled water for agriculture, geothermal facilities, landscaping, parks, public facilities, wildlife enhancement and other uses to the extent practicable, provided that the water meets the applicable water quality standards and is supplied in appropriate quantities for the intended uses.
4. ***Policy WR-4k*:** Where consistent with water quality regulations, encourage graywater systems, roof catchment of rainwater and other methods of re-using water and minimizing the need to use potable surface water or groundwater.

SCWA is involved with coordinating several types of recycled water programs. SCWA works with a number of local authorities responsible for water supply and wastewater collection and distribution. SCWA and its contractors encourage recycled water use by collecting, as part of the water rates, funds to be held in special reserve for recycled water projects carried out by its water contractors and other customers. Current and future recycled water projects have been developed within SCWA's service area to accommodate for additional flow from projected growth as indicated in the adopted general plans and stringent wastewater discharge regulations. SCWA also enters into recycled water use agreements with private individual water users near recycling facilities that it operates (SCWA, 2008).

Recycled Water Use Under NBWRP Phase 2

As shown in Table 5-2 in Section 5.0, regional water supply planning anticipates recycled water use to increase gradually over time, and provision of recycled water has been included in long-term planning. **Table A5-4** below shows the recycled water use under the NBWRP Phase 2 for SVCSD service area. The recycled water produced under the proposed NBWRP Phase 2 would expand the recycled water service area in the unincorporated areas of Sonoma County east of the City of Sonoma along Napa Road. This project would efficiently utilize existing assets to increase the distribution of recycled water. Provision of recycled water within Sonoma Valley would reduce groundwater pumpage, and reduce surface water diversions for irrigation. Provision of these supplies for agricultural irrigation would not affect urban growth trends within the City of Sonoma.

TABLE A5-4: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR SVCSD SERVICE AREA

Project	No Project Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	-0	200 AFY Agricultural	98 AFY
Areas of recycled water use	--	--	Unincorporated areas east of City of Sonoma along Napa Road	Additional Storage and services to Sonoma Valley

SOURCE: Brown and Caldwell, 2017.

The Storage Alternative would include additional storage to provide approximately 98 AFY of additional recycled water for distribution to the Sonoma Valley service area. Similarly, provision of these supplies for agricultural irrigation would not affect urban growth trends within the City of Sonoma.

MMWD Service Area

Water Supply

The Marin Municipal Water District (MMWD) serves the populous eastern corridor of Marin County from the Golden Gate Bridge northward up to, but not including, Novato. The district is bounded by the San Francisco Bay on the east, and stretches through the San Geronimo Valley to the west. The incorporated cities and towns of San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere and Sausalito are within the district's service area. The primary source of water for MMWD is rainfall stored in two of the area reservoirs. MMWD also maintains a line intertie with the North Marin Water District for Russian River water. Seventy-two percent of the water used within the MMWD is from local reservoirs, 25 percent is from the Russian River in Sonoma County via SCWA, and less than two percent is from recycled water (Marin Municipal Water District, 2015). MMWD produces its own recycled water by treating secondary effluent provided to the district by the Las Gallinas Valley Sanitary District. For the period 2000 through 2015, the recycled system demand averaged approximately 695 AFY. However, the actual recycled water supplied to the recycled system averaged 565 AFY, or about 81 percent of the total demand. Recycled water deliveries in 2015 were 520 AFY; this is assumed to remain constant in future years. **Table A5-5** shows the water supply sources for MMWD that serves the Novato SD service area.

TABLE A5-5: WATER SUPPLY SOURCES FOR MMWD (AFY)

Water Supply Source	2015	2020	2025	2030	2035	2040
Surface water*	**20,500**	**20,500**	**20,500**	**20,500**	**20,500**	**20,500**
Surface water (Imported from SCWA)	7,000	8,460	9,920	10,000	10,000	10,000
Recycled Water	520	520	520	520	520	520
Total	**30,035**	**31,500**	**32,965**	**33,050**	**33,055**	**33,060**

NOTE: * MMWD owns and operates 7 surface water reservoirs; 5 within the Mt. Tamalpais Watershed and 2 within West Marin.

SOURCE: Marin Municipal Water District, 2015; Marin County, 2007b.

General Plan Policies

The main constraints and limitations to the water supply in the MMWD service area as noted in the Marin County General Plan relate to SCWA supplies, and are described above under the Novato SD discussion. They include:

1. Physical capacity of SCWA's transmission system;
2. Drought impacts to SCWA supplies. An extended drought could result in a supply reduction of 30 percent or more; and
3. Legal and environmental impacts to SCWA supplies.

Recycled Water Use Under NBWRP Phase 2

Table A5-6 below shows the recycled water use under the NBWRP Phase 2 for MMWD service area. The recycled water produced under the proposed NBWRP Phase 2 would include expansion of a recycled water distribution system from CMSA to San Quentin Prison.

TABLE A5-6: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR MMWD SERVICE AREA

Project	No Project Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	0	153 AFY Urban	0
Areas of recycled water use	None	None	San Quentin Prison	none

Napa SD Service Area

Water Supply

Napa SD provides wastewater services to the City of Napa and other areas within Napa County that receive water supply from the Napa Water Division. The sources of Napa's water supply are Milliken Reservoir, Lake Hennessey, and water purchased under contract from the State Water Project. The Napa County Flood Control & Water Conservation District (NCFCWCD) purchases imported surface water from the State Water Project (SWP), which is owned and operated by the Department of Water Resources (DWR). The NCFCWCD acts as the SWP contract administrator on behalf of the municipalities in Napa County. The SWP water is diverted from the Sacramento-San Joaquin Delta at the Barker Slough Pumping Plant. The water is then conveyed 21 miles through the North Bay Aqueduct (NBA) to Cordelia Forebay and is then pumped an additional 6 miles to the NBA terminal reservoirs. The water is treated at Napa's Jameson Canyon Water Treatment Plant and the City of American Canyon's Water Treatment Plant. The two facilities are directly adjacent to each other.

While the SWP contract amount for the Cities of Napa and American Canyon is 21,900 AFY and 5,200 AFY, respectively, the NBA conveyance capacity limits the supply to 19,900 AFY. Single-dry year supply from the SWP supplies can be substantially curtailed. In 2014, DWR's allocation of SWP water to contractors was 5 percent of the contract amounts. There is a need for additional water supply to accommodate projected growth in the City of Napa (City of Napa, 2007). **Table A5-7** provides the available water supplies for Napa for normal, multi-dry, and single-dry years under current, 2020, and 2050 conditions.

During multi-year droughts, the City's existing water supply is insufficient to meet the needs of the city in the event that there is a cutback in State Water Project allocation. The water deficit would become less problematic in the future because the City's water entitlements from the State Water Project would grow significantly faster than projected increases in water demand in the City's water service area. Based on the City's current contract, the 1996 entitlement of 6,200 AF would increase to 18,800 AF by the year 2021 (its ultimate SWP entitlement). This will provide a surplus in most years and the ability to absorb large cutbacks in dry years. For the purposes of long range analysis, the *Water System Optimization and Master Plan*[2] assumes a 50 percent reduction in SWP deliveries and a reduction in water demand of 20 percent during dry years to reflect the City's drought demand management measures. Based on past drought experience, the impact of this deficit is public inconvenience and minor loss of irrigated landscape. The City's water distribution system also has insufficient short-term storage capability to address current and projected needs (City of Napa, 2007).

The unincorporated areas of Napa County rely principally on groundwater resources and surface water collection. There are three main groundwater basins in Napa County: North Napa Valley, Millikan-Sarco-Tulocay (MST), and Carneros. According to the *2050 Napa Valley Water Resources Study* (West Yost Associates, 2005), during wet years, with ample rainfall, sufficient water supply would be available under current and future conditions,

[2] The City's *1996 Water System Optimization and Master Plan* was prepared to address the current and long-term water supply needs of the community. The plan includes goals, policies and implementation measures, along with the environmental analysis, to address the current and long-term water system needs for the city (City of Napa, 2007).

TABLE A5-7: WATER SUPPLIES FOR NAPA WATER DIVISION (AFY)

Water Source	Normal Year	Multi-Dry Years	Single-Dry Year	*Water Demands*
				Napa
Current				15,370
Total Local Storage	18,200	11,117	5,400	
Total Depletion of Storage	-	1,333	6,600	
Total SWP Water	10,336	5,440	2,720	
Total Water Supply	28,536	17,890	14,720	
2020				18,798
Total Local Storage	18,200	11,117	5,400	
Total Depletion of Storage	-	1,333	6,600	
Total SWP Water	14,972	7,880	3,940	
Total Water Supply	33,172	20,330	15,940	
2050				21,643
Total Local Storage	18,200	11,117	5,400	
Total Depletion of Storage	-	1,333	6,600	
Total SWP Water	15,048	7,920	3,960	
Total Water Supply	33,248	20,370	15,960	

NOTE: SWP = State Water Project

SOURCE: West Yost & Associates, 2005

however storage capacity may be inadequate. Projections for dry years, however, show users in both Napa's incorporated and unincorporated areas may not have enough water to meet all their needs through the year 2050. Thus, both municipal water supplies and groundwater supplies may face challenges (County of Napa, 2008). **Table A5-8** provides water supplies and demand for the unincorporated areas (i.e., Main Basin, MST, and Carneros).

While groundwater use is not a significant source for municipal uses, groundwater typically serves as the main water supply source to meet water demands in the unincorporated areas of the county. The water demand in the Napa River Watershed estimated at approximately 39,500 AFY in 2000 is projected to increase to approximately 51,500 AFY in 2050.[3] The *2050 Napa Valley Water Resources Study (West Yost Associates, 2005)* identifies potential water supply projects that may be pursued to reliably meet existing and future demands. It also cautions municipalities considering groundwater use and urges aggressive pursuit of recycled water as a supply for non-potable (irrigation) water. Napa SD has initiated provision of recycled water to the MST and Carneros areas under the NBWRP Phase 1. Under NBWRP Phase 2, construction of additional tertiary treatment capacity and storage facilities at the Soscol Water Recycling Facility (WRF) would provide 811 AFY of storage to provide daily peak demand reliability to meet both urban and agricultural demands throughout Napa SD's recycled water systems (City of Napa, MST, Carneros systems). **Table A5-8** shows water supply and demand planning in the Main Basin, MST and Carneros areas.

[3] This increase in demand is predominantly a result of existing vineyards ultimately being converted to denser plantings (i.e., increased vine density per unit area).

TABLE A5-8: WATER SUPPLIES AND DEMANDS IN UNINCORPORATED AREAS IN THE PROJECT AREA (AFY)

Water Sources	Groundwater	Surface Water	Recycled Water	*Total Water Supply*	*Water Demands*
Current (2005)					
Main Basin	28,000	7,900	900	36,800	*33,656*
MST	3,054	250	-	3,304	*3,313*
Carneros	1,347 to 1,747	800 to 1,200	-	2,147 to 2,947	*2,547*
Total	32,401 to 32,801	8,950 to 9,350	900	42,251 to 43,051	*39,516*
2020					
Main Basin	28,000	7,900	1,072	36,972	*36,416*
MST	3,040	250	420	3,710	*3,710*
Carneros	744 to 1,172	800 to 1,200	1,495 to 2,110	3,039 to 4,482	*3,467*
Total	31,784 to 32,212	8,950 to 9,350	2,987 to 3,602	43,721 to 45,164	*41,593*
2050					
Main Basin	28,000	7,900	1,500	37,400	*41,148*
MST	3,931	250	420	4,600	*4,601*
Carneros	2,409 to 3,424	800 to 1,200	1,495 to 2,110	4,704 to 6,734	*5,719*
Total	34,340 to 35,355	8,950 to 9,350	3,415 to 4,030	46,700 to 48,735	51,468

SOURCE: West Yost & Associates, 2005

General Plan Policies

Measures explored jointly by the Napa Water Division and Napa SD to address increasing water demands include greater use of recycled water and incentive programs for use of water conservation measures within new developments above and beyond the currently mandated programs (City of Napa, 2007).

The 1998 Napa General Plan lists a policy to evaluate the feasibility of use of reclaimed wastewater in appropriate locations. In order to plan future and adequate water supply capacity and services to Napa, the General Plan calls for the implementation of the *1997 Water System Optimization and Master Plan* (City of Napa, 1998). The 1997 Master Plan identifies use of reclaimed wastewater to offset potable water supplies currently being used to irrigate parks, a golf course, and other landscaped areas in Napa and improvements to water supplies during drought years. The City would enter into an agreement with Napa SD to deliver recycled water to the current City customers. The areas proposed for recycled water use in the General Plan are area south of Imola Avenue, east of Napa River, and west of Highway 221 (including the Napa State Hospital property), the south Napa Market Place, the Stanly Ranch, and the property owned by Napa SD adjacent to Imola Avenue bordering Napa River. The water reuse in the proposed areas would offset potable water use for irrigation of turf at Kennedy Golf Course, Kennedy Park, and Napa Valley College. Recycled water use could offset 400 AF of water currently being used for landscaping irrigation and offset potable water use for landscape irrigation for future development (City of Napa, 1998).

Future growth projected in the Napa Valley is anticipated to exceed current and projected water supply sources under year 2020 and 2050 and would further exacerbate groundwater conditions for MST and Carneros basins. The Napa County General Plan (2008) lists conservation policies that include maintaining and improving slough and tidal mudflats habitat with appropriate measures such as utilizing reclaimed wastewater for salinity control and include promoting development of additional water resources to improve water supply reliability and sustainability in Napa County, including imported water supplies and recycled water projects. The County would promote and support the use of recycled water wherever feasible, including the use of tertiary treated water, to help improve supply reliability and enhance groundwater recharge. Recognizing that groundwater best supports agricultural and rural uses, the County discourages urbanization requiring net increases in groundwater use and

discourages incorporated jurisdictions from using groundwater except in emergencies or as part of conjunctive-use programs that do not cause or exacerbate conditions of overdraft or otherwise adversely affect the County's groundwater resources (County of Napa, 2008).

As stated in Policy AG/LU-74, the County supports the extension of recycled water use to the Coombsville area to reduce reliance on groundwater in the MST groundwater basin and exploration of other alternatives. Also, the County shall identify and support ways to utilize recycled water for irrigation and non-potable uses to offset dependency on groundwater and surface waters and ensure adequate wastewater treatment capacity through measures such as using wastewater treatment and reuse facilities where feasible to reclaim, reuse, and deliver treated wastewater for irrigation and possible potable use depending on wastewater treatment standards and encouraging the use of non-potable/recycled water wherever recycled water is available and require the use of recycled water for golf courses where feasible (County of Napa, 2008).

The 2050 Study[4] identifies potential water supply projects that may be pursued to reliably meet existing and future demands. It also cautions municipalities considering groundwater use and urges aggressive pursuit of recycled water as a supply for non-potable (irrigation) water. The Napa County General Plan contains a number of policies that address water supply, conservation, and reuse. The Plan contains policies supporting the protection of surface and groundwater resources, as well as policies that require the county to monitor groundwater supplies where publicly owned wells exist, and encourage voluntary private monitoring of the county's groundwater resources. The General Plan includes policies that reinforce the development and use of recycled water as a means of meeting future water supply demands (Napa County, 2008a).

Recycled Water Use under NBWRP Phase 2

Table A5-9 below shows the recycled water use under the NBWRP Phase 2 for Napa SD service area. Under NBWRP Phase 2, construction of additional tertiary treatment capacity and storage facilities at the Soscol WRF would provide 811 AFY of storage to provide daily peak demand reliability to meet both urban and agricultural demands throughout Napa SD's recycled water systems (City of Napa, MST, Carneros) which would assist in providing reliable water supply to meet the projected demands shown in Table A5-8 above.

TABLE A5-9: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR NAPA SD SERVICE AREA

Project	No Project Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	0	811 AFY ag/urban	1,050 AFY ag/urban
Areas of recycled water use	None	None	MST area, East Carneros, City of Napa	MST area, East Carneros, City of Napa

SOURCE: Brown and Caldwell, 2017; ESA 2017.

City of Petaluma

Water Supply

Petaluma's primary source of water is Russian River water purchased from the SCWA. Petaluma's monthly water supply entitlement from the SCWA is an average-day maximum month supply of 21.8 mgd and an annual supply limit of 13,400 acre feet per year (4,366 million gallons). The City supplies approximately

[4] The Napa County Flood Control and Water Conservation District recently conducted a study, the "2050 Napa Valley Water Resources Study," comparing available Napa Valley water supplies to existing and future water demands through the year 2050.

68 percent residential and 32 percent non-residential customers, which include commercial, institutional, and industrial customers. Modest population growth translates into water demands increasing from 3,600 million gallons per year (11,000 acre-feet per year) in 2002, to approximately 5,139 million gallons per year (15,775 acre-feet) in 2025. SCWA alone will not be sufficient to meet the growth projected through 2025. By 2025, the average day maximum month (ADMM) demand, or peak demand, will be 22.1 mgd, which exceeds the City's contracted limit of 17.1 mgd. By 2025, this analysis indicates there will be an annual demand shortfall of 773 million gallons (2,371 acre-feet) per year and an ADMM demand shortfall of 5 mgd. **Table A5-10** provides the water supply sources for the City of Petaluma and the projected demand under the 2025 General Plan (City of Petaluma 2015 UWMP). **Table A5-11** shows projected 30% reduction in supplies during dry year conditions, as identified in the City of Petaluma 2015 UWMP.

TABLE A5-10: WATER SUPPLY SOURCES FOR CITY OF PETALUMA (AFY)

Water Supply Source	2020	2025	2030	2035
SCWA	13,400	13,400	13,400	13,400
Recycled Water	1,138	1,301	1,339	1,339
Groundwater	0	0	0	0
Total Water Supplies	14,538	14,701	14,739	14,739

SOURCE: City of Petaluma 2015 UWMP.

TABLE A5-11: SINGLE DRY YEAR SUPPLY AND DEMAND CITY OF PETALUMA (AFY)

Water Supply Source	2020	2025	2030	2035
Total Water Supplies	14,538	14,701	14,739	14,739
Dry Year (30% Reduction) Supply Total (SCWA and Recycled)	7,254	7,530	7,735	7,974
Demand Total	9,536	9,994	10,295	10,616
Total Water Supplies	(2,282)	(2,464)	(2,560)	(2,642)

SOURCE: City of Petaluma 2015 UWMP.

General Plan Policies

The City of Petaluma General Plan lists the following goals and policies that support recycled water use:

Goal 8-G-1: Water Supply and Demand Provide a safe, reliable, high-quality, economical and sustainable source of water to meet the community's needs.

Policy 8-P-5: Develop alternative sources of water to supplement imported supply.

A. Expand the use of recycled water to offset potable demand.
B. Expand water conservation to further improve the efficient use of potable water.
C. Continue to use groundwater to meet emergency needs.

Goal 8-G-3: Recycled Water Maximize the use of recycled water as a potable water offset to manage water demands, and meet regulatory requirements for wastewater discharge.

Policy 8-P-9: Provide tertiary recycled water for irrigation of parks, playfields, schools, golf courses and other landscape areas to reduce potable water demand.

A. Expand the Ellis Creek Water Recycling Facility to provide tertiary and secondary recycled water as outlined in the Recycled Water Master Plan.
B. Operate and maintain the Ellis Creek Water Recycling Facility to produce recycled water to meet or exceed current regulatory standards.

Policy 8-P-10: The City may require the use of recycled water through the City development review process.

A. New development may be required to install a separate recycled water system as deemed necessary and appropriate by the City to offset potable demand.
B. Evaluate where the most appropriate potable water offset improvements can be implemented.
C. Determine the appropriate means of potable offset. Individual project systems may be required in addition to City-required improvements and/or fees relating to the recycled water offset system.

Policy 8-P-11: The City may continue to work with agricultural users to reuse secondary recycled water. In addition, the City may purchase land as a backup reuse site, if deemed necessary and appropriate to meet system needs.

Policy 8-P-12: Provide water of adequate quality and quantity to meet customer needs. The City, at its' sole discretion, during the environmental review and entitlement process, will determine whether a given customer's supply will be potable water, tertiary recycled water, secondary recycled water, groundwater, or a combination of these.

Policy 8-P-13: Work to convert existing potable water customers identified under the City's Recycled Water Master Plan to tertiary recycled water as infrastructure and water supply becomes available.

A. Require implementation of adopted Recycled Water Program improvements through conditions of approval for all public and private development.

Recycled Water Use under NBWRP Phase 2

Table A5-12 below shows the recycled water use under the NBWRP Phase 2 for the City of Petaluma. The recycled water produced under the proposed NBWRP Phase 2 would offset an equivalent amount of potable water use.

TABLE A5-12: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR CITY OF PETALUMA

Project	No Project Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	223 AFY	223 AFY Urban 1,343 AFY Agricultural	300 AFY Agricultural
Areas of recycled water use	None	Eastern Petaluma	Eastern Petaluma, Oakmead Business Park; agricultural customers along Lakeville Highway	Additional storage would provide additional service to Agricultural customers along Lakeville Highway

SOURCE: Brown and Caldwell, 2017.

City of American Canyon

Water Supply

The City of American Canyon contracts with the Napa County Flood Control & Water Conservation District (NCFCWCD) to buy imported surface water from the State Water Project (SWP), which is owned and operated by the Department of Water Resources (DWR). The NCFCWCD acts as the SWP contract

administrator on behalf of the municipalities in Napa County. The SWP water is diverted from the Sacramento-San Joaquin Delta at the Barker Slough Pumping Plant. The water is then conveyed 21 miles through the North Bay Aqueduct (NBA) to Cordelia Forebay and is then pumped an additional 6 miles to the NBA terminal reservoirs. The water is treated at Napa's Jameson Canyon Water Treatment Plant and the City of American Canyon's Water Treatment Plant. The two facilities are directly adjacent to each other. The City of American Canyon also has an agreement to purchase both treated and raw water from the City of Vallejo.

While the SWP contract amount for the Cities of Napa and American Canyon is 21,900 AFY and 5,200 AFY, respectively, the NBA conveyance capacity limits the supply to 19,900 AFY. For the City of American Canyon, single-dry year supply from the SWP supplies can be substantially curtailed. In 2014, DWR's allocation of SWP water to contractors was 5 percent of the contract amounts. Given the uncertainty surrounding the availability of SWP water, the City of American Canyon supplements its water supply with water purchased from the City of Vallejo, which has a significantly higher reliability (City of American Canyon, 2016). The City projects that water demands will increase on average by 4.1 percent annually through 2020 before settling at about 2.0 percent annually through 2035 (City of American Canyon, 2015).

The City of American Canyon also depends on recycled water as an integral piece of its overall water supply portfolio. Since the American Canyon Water Reclamation Facility (American Canyon WRF) was constructed in 2000 the City has been focused on building its recycled water distribution infrastructure in accordance with the City's *2005 Recycled Water Implementation Plan* and Prop 50 Grant. Over the past 15 years the City has made significant strides in constructing the primary components of a distribution system including a pump station at the American Canyon WRF, a 1.0 million gallon (mg) elevated storage tank, and 13 miles of distribution pipelines. The City currently has 8 private recycled water customers and 12 public recycled water customers.

In 2015, the City's recycled water distribution system delivered approximately 175 acre-feet of water to both public and private users, mainly for landscape irrigation at public and commercial facilities. The City's recycled water is also used for agricultural irrigation, dust control at construction sites and internal use of water at the American Canyon WRF. It is estimated that there is over 1,200 acre-feet of recycled water demand within the City's recycled water service area at build-out, which is expected to occur at 2035. **Table A5-13** provides the water supply sources for the City of American Canyon and the projected demand under the General Plan (City of American Canyon, 1994; Kennedy Jenks, 2016).

TABLE A5-13: WATER SUPPLY SOURCES FOR CITY OF AMERICAN CANYON (AFY)

Water Supply Source	2015	2020	2025	2030	2035	2040
SWP/NCFCWCD	2,025	3,413	3,413	3,413	3,413	3,413
City of Vallejo	989	3,140	3,706	3,706	3,706	3,706
City of American Canyon Recycled Water	180	616	655	760	1,271	1,271
Napa Sanitation District Recycled Water	210	391	491	591	591	591
Total Water Supplies	**5,419**	**9,580**	**10,290**	**10,500**	**11,016**	**11,021**

SOURCE: Kennedy/Jenks, 2016;

General Plan Policies

The City of American Canyon General Plan lists the following goals and policies that support recycled water use:

> **Goal 5:** It shall be the goal of American Canyon to establish and maintain a secure water supply and treatment, distribution and storage system to serve the land uses proposed under the general plan.

Objective 5.1: Confirm reliabilty of NBA water supply.

Policies:

5.1.3: Investigate opportunities for additional sharing of NBA supply among NBA users. (I 5.3)

5.1.5: Maximize use of unscheduled water available through the NBA. (I 5.3)

Objective 5.2: Obtain additional water supply sources as necessary to supplement the NBA supply and serve anticipated growth under the proposed land use plan.

Policies:

5,2.4: Promote water conservation and wastewater reclamation as additional water supply sources. (I 5,2, 15.16 through I 5.23)

Objective 5.4 Establish a water management program to promote water conservation and wastewater reuse.

Policy: 5.4.4 Investigate potential uses for and costs of supplying reclaimed wastewater. (I 5.1 and I 5.23)

Recycled Water Use under NBWRP Phase 2

Table A5-14 below shows the recycled water use under the NBWRP Phase 2 for the City of American Canyon. The recycled water produced under the proposed NBWRP Phase 2 would offset equivalent amount of potable water use.

TABLE A5-14: RECYCLED WATER USE UNDER THE PROPOSED NBWRP PHASE 2 FOR CITY OF AMERICAN CANYON

Project	No Project Alternative	No Action Alternative	NBWRP Phase 2	Storage Alternative
New recycled water use (AFY)	0	0	295 AFY Urban	0
Areas of recycled water use	None	None	Northern and western portions of City	None

Member Agency Recycled Water Use, General Plan Significant Impacts, and Mitigation Measures

Novato SD

Under Phase 2, Novato SD would provide 1,166 AFY of recycled water, including 286 AFY available for urban irrigation and 880 available for restoration. Between 2015 and 2035, projected potable water use for NMWD is anticipated to increase from 7,829 AFY to 9,069 AFY, or approximately 1,240 AFY. This includes development of approximately 650 AFY of recycled water.

NBWRP Phase 2 would provide 286 AFY of recycled water from Novato SD for use within the NMWD service area. This represents approximately 23 percent of the projected 1,240 AFY of additional water supply projected by NMWD as necessary to meet demands associated with buildout under the approved General Plans within its service area. Because recycled water is included within the water supply planning of NMWD and SCWA, and NBWRP Phase 2 would be consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban growth within Marin County. While project implementation would not induce or alter growth trends in Marin County, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to

occur. **Table A5-15** summarizes the secondary effects of growth identified under the City of Novato General Plan EIR. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

TABLE A5-15: IMPACTS ASSOCIATED WITH CITY OF NOVATO GENERAL PLAN IMPLEMENTATION

City of Novato
Significant But Mitigable Impacts
1) Increased risk to people and structures during seismic events.
2) Increased risk to new development from tsunamis.
3) Increased risk of Stafford Dam failure.
4) Exposure to slope failure hazard.
5) Construction impacts to streams from erosion and sedimentation.
6) Impacts to mineral resources.
7) Permanent changes in topography from earthmoving and grading activities.
8) Increased exposure of people and structures to flood hazards.
9) Impacts to drainage and increased flooding due to impervious surface cover.
10) Impacts to streams and stream habitat from runoff and creek bank slumping
11) Impacts from runoff could increase the transport of oils, greases and other residues to receiving waterways.
12) Potential risk of flood from predicted sea level rise.
13) Reduction of the number of trees in the City (especially Oak).
14) Loss of wildlife movement or migratory corridors, and plant dispersal opportunities.
15) Introduction of invasive or exotic species.
16) Displacement of populations of plants and wildlife
17) Adverse effects on areas of archaeological and historic importance.
18) Impacts to traffic safety and residential neighborhoods from increased volumes of traffic.
19) Reduced bicycle and pedestrian safety on roads, and increased demand for bikeways and pedestrian paths.
20) Increased traffic congestion on City streets.
21) Traffic compliance with the Congestion Management Plan.
22) Substantial increase in noise levels along certain roadways.
23) Compatibility of new development and surrounding noise environment.
24) Consistency of new development with scale, style, and character of existing development.
25) Alteration of views along designated corridors and entry points to the city.
26) Increase in daytime glare and nighttime lighting.
27) Construction of future sound walls will alter existing views.
28) Increased amount of wastewater to be treated at existing treatment facilities.
29) Inability of existing sewer collectors to collect wastewater.
30) Increased demand for public water.
31) Need to construct or replace water mains, storage facilities, treatment facilities, and pump stations.
32) Increased demand for fire protection services.
33) Need for new water mains to ensure adequate fireflows.
34) Expanded use, storage, and transport of hazardous materials.
35) Increased demand for recreational facilities.
36) Additional amounts of solid waste.
37) Exposure to electromagnetic fields.
38) Conversion of agricultural land to non-agricultural uses.
39) Conversion of potential open space to developed land.
40) Risk to people and structures at Gnoss Field airport from surrounding development.
41) Conflict between land use designation under the Sphere of Influence and land use designations under the Marin Countywide Plan
42) Compatibility of residential development n areas currently used for commercial uses.
43) Conversion of vacant land to housing and commercial development.

TABLE A5-15: IMPACTS ASSOCIATED WITH CITY OF NOVATO GENERAL PLAN IMPLEMENTATION (CONTINUED)

City of Novato (cont.)
Significant and Unavoidable Impacts
1) Displacement of wetlands.*
2) Buildout traffic will cause portions of Highway 101 and Highway 37 to operate at unacceptable levels of service.**
3) Increased number of calls for emergency medical response.
4) Increased need for police protection.
Less Than Significant Impacts
1) Altered traffic volumes could cause concentrations of localized air pollutants such as carbon monoxide near streets and intersections.
2) Increased wastewater could exceed capacity of Novato SD facilities.
3) Increased demand for fuel and energy.
4) Alteration of the character of the area by implementation of the Downtown Specific Plan.
5) Expansion of the City's Sphere of Influence.
6) Increase in project-generated noise sources
7) Increase in project-generated construction noise
8) Carbon monoxide concentration along roadways.
9) Impacts from transport of hazardous materials

NOTES:

* Mitigation measures have been established to protect wetlands, but the EIR identifies the loss of some wetlands as significant and unavoidable.

** The traffic on the highways that cause an unacceptable level of service originates from outside of Novato. Even if the City were to limit growth within its jurisdiction, the level of service along these highways would still deteriorate.

SOURCE: Leonard Charles and Associates, 1995.

Mitigation Measures (Novato)

Mitigation measures proposed in the Novato General Plan EIR (1995) are described below:

1. ***Geology*:** Include policies that require geotechnical and engineering reports, professional inspection of foundation, monitor existing high priority buildings to ensure structural compliance with seismic safety standards, and provide public information on building safety. To protect new development, require proper siting of projects, setbacks from active faults, restricted development in low lying areas by the Bay, and setbacks from the Stafford Dam.
2. ***Cultural Resources*:** Implement archaeological resources protection through a program that requires that all major development applications be reviewed for potential archaeological resources and that protection measures would be determined by a professional archaeologist.
3. ***Traffic*:** Evaluate level of service on streets, reduce through-traffic on residential streets, and adopt and enforce a truck route to limit truck presence on residential streets. Investigate mitigation measures for projects that would cause a substantial increase in traffic noise to adjacent residential areas.

   ***Aesthetics*:** Prohibit development within 100 vertical feet of a designated ridgeline within a scenic area, and require development to be clustered below the ridge in areas of open or grassy hillsides. All development along the west side of the freeway from the northern edge of Novato to Atherton Avenue and from the southern edge of Novato to Ignacio Boulevard would be subject to prepare a Constraints Analysis. Implement Lighting Design Guidelines, which incorporate design guidelines for exterior lighting and recommend types of lights and lighting that address security, appearance, and intensity while protecting City views. Caltrans will perform a visual analysis for all new sound walls to show the existing and future views at critical points in order to make a determination. Adopt the Scenic Resources Overlay Zone which establishes criteria to protect ridgelines, hillsides, and other scenic resources and review development proposals on an individual basis to determine the scenic value of visual resources specific to

the site. Other measures include landscaping, discouraging repetition and using traditional site design, and evaluating the compatibility with surrounding development.

4. ***Fire Hazards*:** Continue to require all new development to meet adopted fire safety regulations (Fire Code appendix), require all development that includes private access roads to provide access to the Novato Fire Protection District, and implement the Fire Hazard on Public Lands Policy to manage public lands to minimize chances of wildfire.
5. ***Biological Resources*:** To mitigate the impact from introduced exotic or invasive species, one measure includes implementing constraints via the Land Use Chapter Constraints Analysis to ensure pampas grass, acacia, and broom will not be planted as part of new development projects. A new policy will protect ridgelines as critical wildlife corridors to enhance biological resources. Implement Bayfront Overlay Zone in addition to a 100-foot buffer between wetlands and new development to mitigate impacts to habitat, a U.S. Army Corps of Engineers Determination of Wetlands Statement, and new programs for determining, regulating, and permitting wetlands.
6. ***Air Quality*:** Enforce U.S. Environmental Protection Agency standards for particulate emissions when wood-burning fireplaces or stoves are installed, review all industrial development for potential impact to sensitive receptors, and require buffer zones between industrial development and sensitive receptor.

SVCSD

Under NBWRP Phase 2, SVCSD would provide 200 AFY of recycled water to the unincorporated areas of Sonoma County east of the City of Sonoma along Napa Road. Between 2015 and 2040, surface water supplies to the City of Sonoma are anticipated to increase from 1,588 AFY to 2,212 AFY, or approximately 624 AFY. Supplies to the Valley of the Moon Water District are anticipated to increase by 1,181 AFY from 1,837 AFY to 3,018 AFY. Under NBWRP Phase 2, recycled water would be available to offset 200 AFY of agricultural demands in Sonoma Valley, or approximately 3% of the combined potable demand increase identified for City of Sonoma and Valley of the Moon. As previously noted, Sonoma County Water Agency has included provision of recycled water to the Sonoma Valley within its regional water supply projections.

Because the provision of recycled water has been included within the water supply planning of SCWA for urban uses, and NBWRP Phase 2 is consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban or agricultural growth within the City of Sonoma or Sonoma Valley.

While project implementation would not induce or alter growth trends in the Sonoma Valley, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to occur. **Table A5-16** summarizes the secondary effects of growth identified under the City of Sonoma General Plan EIR. **Table A5-17** summarizes the secondary effects of growth identified under the Sonoma County General Plan EIR. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

Mitigation Measures (City of Sonoma)

Mitigation measures identified in the City of Sonoma General Plan EIR to minimize or reduce the impacts caused by implementation of the City of Sonoma General Plan are described below:

1. ***Visual Resources*:** Utilize high quality architectural designs in new development, preserving scenic vistas and corridors, retaining prominent natural features on project sites, and encouraging architectural designs that are consistent with the historic character of the community.
2. ***Land Use:*** Maintain an Urban Growth Boundary to limit urban expansion, develop new General Plan policies and Specific Plan features, and contract the city's Sphere of influence.

TABLE A5-16: SIGNIFICANT IMPACTS OF GENERAL PLAN DEVELOPMENT ASSOCIATED WITH THE CITY OF SONOMA

City of Sonoma
Significant But Mitigable Impacts
1) Increased short-term and long-term erosion potential.
Significant and Unavoidable Impacts
1) Conversion of undeveloped, agricultural, or open space lands to urban uses or changes in land use type.
2) Compatibility of land uses with adjacent communities.
3) Conversion of farmland/ prime agricultural soils to urban uses.
4) Impacts to local roadways and intersections which would result in unacceptable LOS.
5) Increased volumes on local roadways.
6) Public transit capacities would be inadequate to meet increased traffic demand and transit demand.
7) Compliance with regional air quality plan and federal air quality standards.
8) New emissions generated by new development would increase air pollution and cause deterioration in regional air quality.
9) Significant increase in noise for some existing residents from increased traffic, recreational activities, and commercial and industrial uses.
10) Development would require additional law enforcement officers, equipment & facilities.
11) Development in rural/hilly areas would increase the potential risk for wildland fires.
12) Need for additional emergency medical services, fire fighters, equipment & facilities.
13) Demand for school facilities may exceed available capacity, and facilities may be degraded.
14) Increased need for library facilities.
15) Need for new parks & recreational facilities and/or managed open space.
16) Increased demand for, water supply & water service extensions.
17) Increased demand for supply, treatment and distribution facilities for wastewater.
18) Generation of significant amounts of solid waste, including demand for a new County landfill site.
19) Growth in population and employment could lead to possible damage, destruction, or removal of recorded and unrecorded cultural resources.
20) Future development has the potential to adversely affect historic resources.
21) Residential, commercial and industrial growth under the plan would increase energy consumption.
22) The impacts of increased population and jobs occur as secondary impacts.
23) Increased need for housing units, particularly affordable housing units, as population increases.
24) Substantial alteration of Valley's visual character.
25) Potential for structural damage and injury or loss of life due to impacts from strong groundshaking, including liquefaction.
26) Grading and excavation will permanently change the ground surface relief.
27) Increased risk of pollution from the use, storage, and treatment of hazardous materials.
28) Increased demand for hardrock and aggregate resources.
29) Short-term erosion and associated sedimentation potentials, with impacts to water quality.
30) Impacts to groundwater by reducing supply due to interruptions of recharge and upstream retention of surface flow.
31) Increase of urban runoff pollutants and degradation of existing water quality.
32) Increase in quantity of runoff, leading to increased flooding hazards.
33) Permanent direct habitat loss and accompanying reduction or elimination of dependent wildlife, including some special status species.
34) Permanent loss of significant habitat (creeks, vernal pools, swales, riparian habitat, freshwater marshes, native grasslands, significant trees, etc).
35) Cumulative direct loss of wildlife habitat.
Less than Significant Impacts
1) Changes to Land Use Designation, map, and policies.
2) Impacts on land use character and existing pattern of development.
3) Impacts to agriculture.
4) Compatibility with existing land uses.
5) Growth inducing impacts on land use or visual resources.
6) Impacts to population based on ABAG's growth projections.

TABLE A5-16: SIGNIFICANT IMPACTS OF GENERAL PLAN DEVELOPMENT ASSOCIATED WITH THE CITY OF SONOMA (CONTINUED)

City of Sonoma
Less than Significant Impacts (cont.)
7) Impacts on housing, employment, and jobs/ housing balance.
8) Impacts on pedestrian and bicycle paths, lanes, and rotes.
9) Increased demand for schools, parks, or other public facilities.
10) Impacts from groundshaking on new development.
11) Increased vehicular noise, and traffic noise level compatibility with future development of adjacent land.
12) Increases in stationary noise.
13) Consistency with applicable air quality plans and air Quality standards.
14) Consistency with population increases and VMT projections.
15) Increased risk of earthquake hazards for new development.
16) Impacts from hazardous materials and waste.

SOURCE: City of Sonoma, 2006b

TABLE A5-17: SIGNIFICANT IMPACTS FROM GENERAL PLAN DEVELOPMENT ASSOCIATED WITH SONOMA COUNTY

Sonoma County
Significant But Mitigable Impacts
1) Convert farmland/prime agricultural soils to urban uses.
2) Impacts to local roadways and intersections which would result in unacceptable LOS.
3) Increased volumes on local roadways.
4) Development would require additional law enforcement officers, equipment & facilities.
5) Need for additional emergency medical services, fire fighters, equipment & facilities.
6) Water demand from urban development could exceed the existing SCWA entitlement.
7) Increased demand for, water supply & water service extensions.
8) Increased demand for supply, treatment and distribution facilities for wastewater.
9) Growth in population and employment could lead to possible damage, destruction, or removal of recorded and unrecorded cultural resources.
10) Future development has the potential to adversely affect historic resources.
11) Increased short-term and long-term erosion potential.
12) Structural damage from soil properties.
13) Short-term erosion and associated sedimentation potentials, with impacts to water quality.
14) Increase of urban runoff pollutants and degradation of existing water quality.
15) Increase in quantity of runoff, leading to increased flooding hazards.
16) Increased sedimentation and runoff from construction activities
17) Permanent direct habitat loss and accompanying reduction or elimination of dependent wildlife, including some special status species.
18) Permanent loss of significant habitat (creeks, vernal pools, swales, riparian habitat, freshwater marshes, native grasslands, significant trees, etc).
19) Development could preclude future restoration of special habitats (native grasslands, oak savannas, wet meadows, vernal swales, and vernal pools).
20) Cumulative direct loss of wildlife habitat.
Significant and Unavoidable Impacts
1) Substantial alteration of Valley's visual character.

TABLE A5-17: SIGNIFICANT IMPACTS FROM GENERAL PLAN DEVELOPMENT ASSOCIATED WITH SONOMA COUNTY (CONTINUED)

Sonoma County (cont.)
Less than Significant Impacts
1) Impacts from growth and concentration of populations
2) Increased demand for transit services.
3) Impacts to air traffic safety.
4) Conflict with alternative transportation.
5) Decreased parking capacity or emergency access.
6) Safety risk from transportation system design.
7) Impacts to noise sensitive development from roadway noise, airport noise, or stationary noise.
8) Impacts to water quality as a result of new development.
9) Increased soil erosion and sedimentation as a result of construction activities for new development.
10) Increase sewer- and septic- related water quality problems.
11) Increased flood risk as a result of storm drainage alteration.
12) Placement of housing within 100-year flood hazard areas.
13) Impacts on jurisdictional wetlands.
14) Conflict with local biological resource protection ordinances.
15) Conflict with HCP or NCCP.
16) Exposure of new development to expansive soils or soils unsuitable to support septic systems.
17) Conflict with HCP or NCCP.
18) Loss of availability of known mineral resources.
19) Conversion of agricultural land to non-agricultural uses.
20) Impacts to agricultural processing and support uses.
21) Impacts as a result of land conversion to support agricultural tourism.
22) Conversion of timberland to non-timber uses.
23) impacts to community separators, scenic landscape units, scenic corridors, and scenic highways.
24) Visual impacts in other urban or rural areas.
25) Increased energy consumption for new land uses or development patterns.
26) Increased energy consumption from building construction and retrofit.
27) Exposure to population from release of hazardous materials, including areas near airports.

SOURCE: Sonoma County, 2006

3. ***Traffic:*** Install road improvements along certain roads and specific intersections.
4. ***Noise:*** Implement setbacks, sound barriers, and noise-reducing construction practices.
5. ***Public Services and Utilities:*** Evaluate and adjust allocation to police and fire protection, and emergency medical services. Contract negotiations with SCWA to increase the City's entitlement, promotion of water conservation and recycling, and provision of maintenance and upgrading of the municipal water system to mitigate water supply demands. Increase in conservation, reclaimed water use, additional treatment facilities, and compliance with upgraded NPDES permits to mitigate wastewater service impacts.
6. ***Cultural Resources*:** Conduct archaeological field surveys and evaluate sites containing historic structures.
7. ***Geology/ Hydrology*:** Prepare a grading and design plan that includes erosion control and rehabilitation phases. Incorporate specific design criteria to correct for soil properties like shrink-swell to mitigate structural damage from soil properties. Implement SCWA Flood Control Design Criteria, best management practices, and provisions for permanent surface maintenance for all new development.
8. ***Biological Resources*:** Implement offsite mitigation to compensate losses, riparian habitat restoration activities, proper siting and placement of projects and bikeways, and City cooperation with local farmers to increase habitat protection.

Mitigation Measures (Sonoma County)

Mitigation is identified in the Sonoma County General Plan EIR to minimize or reduce the impacts cause by implementation of the Sonoma County General Plan. As shown in **Table A5-17**, some impacts can be mitigated to a less than significant level, while others, despite mitigation, will remain significant or significant and unavoidable. The environmental effects of growth most commonly identified as significant and unavoidable are land use conflicts, increased traffic impacts, impacts to public utilities and services, including water supply, wastewater capabilities, and solid waste disposal. The mitigation provided for these impacts include a series of efforts and policies to be implemented.

For Sonoma County, increased short-term and long-term erosion potential can be mitigated to less than significant levels by preparing a grading and design plan that includes an erosion control and rehabilitation plan, restricting location of projects to slopes of 30 percent or more, and maintaining the natural topography of the project site.

For example, the impacts to agricultural resources are targeted by maintaining an Urban Growth Boundary to limit urban expansion, establishing agricultural zoning districts, and establishing densities and parcel sizes to protect soils for continued agricultural use. Compatibility of land uses with adjacent communities is implemented through new policies in the General Plan.

Measures to mitigate some other impacts include the following:

1. ***Traffic*:** Install road improvements along certain roads and specific intersections and integrate bicycle and pedestrian corridors with local and county-wide transit systems.
2. ***Traffic and Air Quality*:** Identify and implement new transit opportunities, mixed-use development, and foster interagency cooperation to integrate air quality planning efforts with transportation planning. Install buffer zones and setbacks to reduce the impacts from air quality and noise on sensitive receptors.
3. ***Public Services and Utilities*:** Expand the law enforcement staff, facilities, and equipment, and continue to prioritize efforts; evaluate fire and emergency services, incorporate California Department of Forestry safety standards, and prepare a countywide fire services master plan. Require new development to pay a fair share of new facilities and expanding existing facilities. Promote water conservation and recycling, and verify the ability of water supplies to serve new development. Increase reclaimed water use and implement programs identified in the Solid Waste Management Program.
4. ***Cultural Resources*:** Conduct archaeological field surveys, evaluate sites containing historic structures, and County Landmarks Commissions.
5. ***Visual Resources*:** Preserve scenic vistas, retain prominent features on project sites, and eliminate commercial and industrial uses in community separators.
6. ***Hazardous Materials*:** Prepare and implement Hazardous Materials Management Plan and conduct proper siting of hazardous facilities.
7. ***Mineral Resources*:** Maintain an Aggregate Resources Management Plan and prioritize production sites to minimize adverse impacts from increased demand for aggregate resources.
8. ***Hydrology*:** Implement best management practices, and Master Drainage and Flood Control Plan, and groundwater well monitoring activities.
9. ***Biological Resources*:** Install setbacks for structures from the edge of marshes or wetlands, offsite mitigation, design criteria, and stream conservation area.

MMWD

Under NBWRP Phase 2, MMWD would provide 153 AFY of recycled water to the San Quentin Prison. The San Quentin Prison facility is located in Marin County in the small unincorporated community of San Quentin, also known as San Quentin Village or Point San Quentin Village. This area is outside of the City of Larkspur limits, but inside the City of Larkspur Urban Service Area (Marin County, 2007a). The City of Larkspur Draft 2030 General Plan acknowledges the State's intention to continue operating San Quentin Prison, located on the San Quentin Peninsula east of Larkspur Landing in the long-term, as well as the County's regulatory jurisdiction over private land use changes at the site. As the site is located in the City's Sphere of Influence, the General Plan provides general policy direction for development on the San Quentin Peninsula if the prison is ever closed, reverted to private use, or annexed to the City. (City of Larkspur, 2011). The portion of the project within the Central Marin Sanitation Agency (CMSA) treatment facility and a portion of the pipeline connecting to the San Quentin Prison, would be located in the City of San Rafael within Marin County.

Between 2015 and 2035, MMWD projected potable water use is anticipated to increase from 23,206 AFY to 25,260, or approximately 2,054 AFY. Under NBWRP Phase 2, recycled water would be available to offset 153 AFY of urban demands for MMWD, or approximately 7 percent of this projected potable demand increase within the MMWD service area. As previously noted, MMWD has included provision of recycled water to its service area within its regional water supply projections.

While project implementation would not induce or alter growth trends in Marin County, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to occur. **Table A5-18** summarizes the secondary effects of growth identified under the Marin County General Plan EIR. **Table A5-19** summarizes the secondary effects of growth identified under the City of San Rafael General Plan EIR. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

Mitigation Measures (Marin County)

Mitigation measures proposed in the Marin County General Plan EIR (2007b) include the following measures:

1. ***Traffic*:** Include new establishing policies that would require new transit nodes near new residential areas to reduce vehicle miles traveled, improved operational conditions at specific intersections, and road improvements or additions including reconfiguring or widening some roadways to accommodate more lanes.
2. ***Air Quality:*** Revise General Plan policies to consider odors and toxic air contaminants during siting of facilities; Bay Area Air Quality Management District standards; and a Climate Change Planning Process to implement the Greenhouse Gas Reduction Plan.
3. ***Noise:*** Requiring noise studies prior to approval of any discretionary project involving a potentially significant new noise source or a noise sensitive land use in a noise-impacted area, and providing setbacks, sound attenuation barriers and appropriate building designs.
4. ***Groundwater:*** Implement ordinances that maintain groundwater recharge and surface water runoff management, establishing a Septic Inspection, Monitoring, and Maintenance District, and implementing ordinances that address non-point source pollution, erosion, sediment control, floodplain development, and groundwater supplies.
5. ***Biological Resources:*** Require new development to compensate for the loss of habitat through offsite mitigation and extension of wildlife corridors and actively restore aquatic habitats for listed anadromous fish. The County would also develop Habitat Monitoring Programs and ensure that future development applicants consider overall habitat values.
6. ***Geology:*** Prepare a geotechnical report, incorporate engineering specifications to address susceptibility of a project site to liquefaction, compliance with the Alquist-Priolo Earthquake Fault Zoning Act, enforce

state seismic safety standards and a limitation on the location and intensity of development in areas with significant geologic hazards, and revise policies related to seismic safety, retrofit, and location of emergency services to ensure seismic safety of new structures. This would also require the necessary retrofit of critical facilities and proper location of new emergency facilities. The County would continue to implement ordinances to ensure that new construction utilizes seismic safety design requirements, seismic shut off devices, etc.

TABLE A5-18: IMPACTS ASSOCIATED WITH MARIN COUNTY GENERAL PLAN IMPLEMENTATION

Marin County
Significant and Mitigable Impacts
1) Addition of new/ expanded agricultural processing, retail sales, and visitor-serving uses on agricultural land, which conflicts with agricultural land use.
2) Development of residential land uses is incompatible with established land use.
3) Conversion of undeveloped, agricultural or open space lands to urban uses.
4) Compatibility of land uses with existing adjacent communities.
5) Increased pollutants and sedimentation reduction in water quality.
6) Reduction in groundwater recharge.
7) Alteration of drainage patterns.
8) Increased exposure of structures to subsidence and settlement.
9) Structural damage from soil properties.
10) Impacts to water supply from septic systems.
11) Permanent direct habitat loss and accompanying reduction or elimination of dependent wildlife, including some special status species.
12) Permanent loss of sensitive natural communities (creeks, vernal pools, swales, riparian habitat, freshwater marshes, native grasslands, significant trees, etc).
Significant and Unavoidable Impacts
1) Growth within unincorporated areas.
2) Convert farmland/prime agricultural soils to urban uses.
3) Increase in vehicle miles traveled.
4) Impacts to local roadways and intersections which would result in unacceptable LOS.
5) Increased volumes on local roadways.
6) Inconsistent with Clean Air Plan Transportation Control.
7) Buffer zones for potential source of odor/toxics.
8) Increase in greenhouse gas emissions
9) Temporary significant increase in noise from construction activities.
10) Potential for structural damage and injury or loss of life due to impacts from strong groundshaking, including liquefaction.
11) Increased risk from seismic related ground failure.
12) Increased exposure of people and structures to landsliding.
13) Cumulative direct and permanent loss, fragmentation of existing wildlife habitat, and obstruction of movement between habitats.

SOURCE: Marin County, 2007b

Mitigation Measures (City of San Rafael)

Table A5-19 summarizes the secondary effects of growth identified under the San Rafael County General Plan. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

TABLE A5-19: IMPACTS ASSOCIATED WITH SAN RAFAEL GENERAL PLAN IMPLEMENTATION

City of San Rafael
Significant and Mitigable Impacts
1) Impacts from odors and toxics.
2) Impacts from nighttime lighting and glare.
3) Impacts to special status plant and animal species.
4) Direct and indirect impacts to sensitive natural communities.
5) Exposure of people and structures to potential adverse seismic effects (groundshaking).
6) Exposure of people or structures to seismic related ground failure.
7) Impacts to property and structures from ground subsidence hazards.
8) Impacts from construction of septic tanks on soils incapable of supporting these systems.
Less Than Significant Impacts
1) Conflict with applicable land use or other plans.
2) Incompatible land uses and changes to neighborhood character.
3) Growth and concentration of population.
4) Employment growth rate.
5) Jobs-to-housing ratio.
6) Increased demand for bicycle routes, pedestrian facilities, and transit services.
7) Consistency with the Clean Air Plan.
8) Consistency with the Clean Air Plan Transportation Control Measures.
9) Increased traffic noise.
10) Increased exposure from stationary noise sources.
11) Increase airport noise.
12) Impacts to future noise sensitive development.
13) Demand for fire and emergency services.
14) Increased potential for wildland fires.
15) Exposure to underground hazardous wastes.
16) Demand for school services.
17) Wastewater treatment capacity- north of Puerto Suello Hill.
18) Potential to exceed landfill capacity.
19) Increased demand for electricity, natural gas, and gasoline.
20) Impacts on archaeological and prehistoric resources.
21) Impacts on historic or cultural resources.
22) Impacts to scenic vistas and visual resources.
23) Alteration of the visual setting and character of the City.
24) Conflicts with adjoining development relative to height.
25) Impacts to federally protected wetlands.
26) Restriction of movement of native wildlife.
27) Loss of habitat and invasive plant species introduction.
28) Adverse effects from expansive soils.
29) Increase in loading of petrochemical contaminants, heavy metals, and pesticides into drainageways.
30) Increases in impervious surface cover and impact to groundwater resources.
31) Incremental increase in project-induced erosions and sedimentation.
32) Increases in peak flow rates on flooding and/or stormwater drainage system capacity.
33) Exposure of new development to levee failure.
34) Need for expanded stormwater drainage system.
35) Exposure of people or structures to flooding hazards.
36) Risk of inundation by seiche, tsunami, or mudflow.
37) Conversion of farmland to non-agriculture use.

TABLE A5-19: IMPACTS ASSOCIATED WITH SAN RAFAEL GENERAL PLAN IMPLEMENTATION (CONTINUED)

City of San Rafael (cont.)
Significant and Unavoidable Impacts
1) Level of service at various intersections.
2) Impacts to on-street parking along various streets.
3) Increased rail noise.
4) Release of hazardous materials.
5) Exacerbation of deficiency in park facilities.
6) Demand for police services that exceeds existing capacity.
7) Demand for library services.
8) Wastewater Treatment capacity- south of Puerto Suello Hill.
9) Potential for demand to exceed water supplies.
10) Exposure of people or structures to landslide events.

SOURCE: City of San Rafael, 2004.

Mitigation Measures (San Rafael)

The EIR lists the following measures to mitigate impacts that are identified as significant. The mitigation measures are described according to the resource areas.

1. ***Air Quality*****:** Create a setback for projects proposed within 500 feet of large highways and include a health analysis and modeling to minimize impacts to sensitive receptors from emission of odors and toxic contaminants.
2. ***Hazardous Materials*****:** Implement a new program to require the City of San Rafael to survey existing industrial facilities within quarter-mile of schools to determine the presence of hazardous materials and risk of a release to mitigate impacts from hazardous materials or waste near schools. Restrict siting of facilities that could increase risk of release in close vicinity of schools.
3. ***Aesthetics*****:** Prepare a lighting plan for parking lots to minimize impacts from new sources of light or glare and nighttime lighting. A lighting plan would include provisions to shield light sources from off-site view, downcast lights, prevent light from escaping, use low intensity, indirect light sources, and restricting mercury, metal halide, and other intense bright lights.
4. ***Biological Resources*****:** Implement programs that require surveying of vacant sites to determine presence or absence of species, on-site preservation or off-site compensation for lost habitat (i.e., easements), and restoration efforts to mitigate impacts to biological resources. The Oak Savanna and Woodland Habitat Protection Program would mitigate the loss of sensitive natural communities by requiring compensation.
5. ***Geology*****:** Implement the following measures:
    a. A General Plan policy that would require building inspections, inspections of other facilities, storm drains, levees, freeways, and other infrastructure, and require the Community Development Department to develop a list that identifies and prioritizes hazardous facilities;
    b. A policy that directs the City to coordinate with the Intergovernmental Panel on Climate Change to determine sea level rise and needs for levee improvements;
    c. A program for levee upgrading;
    d. An amendment to the shoreline embankments policy that includes rip-rap inspection and erosion protection; and
    e. A General Plan policy to discourage the use of septic systems unless there is no other alternative, in which case additional requirements would need to be met.

6. ***Mitigation Measures identified for impacts that would remain significant and unavoidable*:** SMART shall conduct a detailed noise assessment and implement mitigation to reduce noise impacts to an acceptable level for any rail project within its right-of-way.

   A new policy that requires remediation and cleanup in order to develop on sites where hazardous materials have impacted soil or groundwater will be required to mitigate releases of hazardous materials.

7. ***Public Services: Police*:** Determine the existing and projected facility needs of the police departments, obtain funding for improvements, and construct additional facilities. Additional facilities that would need to be constructed are specified in other mitigation measures to improve drainage, sediment control, and particulate matter reduction.
8. ***Parks*:** Construct recreational facilities, establish creek and drainageway setbacks, and reduce runoff.
9. ***Library Services*:** Implement policies that would limit the impacts from new library facility construction, like setbacks, runoff reduction, and sediment control.
10. ***Water Services*:** To meet projected water demand, MMWD will implement measures to promote conservation, research new water supplies (like desalination), and construct necessary infrastructure.
11. ***Wastewater Services*:** Determine the need and cost of improvements, analyze storage alternatives, increase facilities, and assess collection systems.[5]
12. ***Construction Impacts*:** Implement creek and drainageway setbacks, reducing runoff and sedimentation, and controlling particulate matter pollution.

Napa SD

Under NBWRP Phase 2, Napa SD would increase treatment and storage capacity to provide 811 AFY of recycled water and increase the reliability of recycled water supplies particularly in the high demand summer irrigation periods to the City of Napa, Carneros and MST areas for agricultural, golf course and residential landscaping. This additional recycled water would be available to serve varying types of land uses within the City of Napa, MST, and Carneros recycled water systems.

Water supply within the MST area and Carneros area are primarily limited to groundwater pumpage, with a small amount of local surface diversions. Due to declining groundwater levels in the MST area, the County Board of Supervisors adopted the Napa County Groundwater Ordinance in 1996. The ordinance requires a groundwater permit for new water supply uses on properties, including residential development and agricultural development. The ordinance requires property owners to demonstrate no net increase in groundwater use onsite, and the ability to comply with application limits, established at 0.3 AF per acre per year for new residential and vineyard development. Existing vineyard developments that intend to re-plant or re-develop would be limited to an average 0.3 AF per acre of water per year, averaged over a three-year period with no annual use exceeding the total average allotment by more than 15 percent.

It should be noted that the existing un-irrigated parcels within the MST area are not restricted from agricultural uses that are consistent with their General Plan and Zoning designations, and that are in conformance with the Napa County Groundwater Ordinance, which provides for a usage rate of 0.3 AF per acre per year, and requires land owners to demonstrate no-net increase and fair-share practices. Therefore, the availability of an alternative supply to groundwater could be one of several contributing factors that would allow lands that are currently un-irrigated to be placed in irrigated agriculture, consistent with their General Plan land use designations. No additional pipeline distribution is proposed under the Proposed Action; as such, new service to additional unirrigated agricultural lands is not anticipated.

[5] Although wastewater flows would not exceed the treatment capacity of the LGVSD facilities, wastewater flows generated south of Puerto Suello Hill will exceed the capacity of Central Marin Sanitation District facilities.

Actual development of vineyards within the MST area would be subject to a number of requirements and ordinances established under the Napa County General Plan, including the restriction of vineyard development on slopes in excess of 30 percent. These requirements and ordinances are identified below.

1. County Code Section 18.108.060 states that no construction, improvement, grading, earthmoving activity or vegetation removal associated with the development or use of land shall take place on those parcels or portions thereof having a slope of 30 percent or greater (i.e., approximately 325.5 acres in the MST area) are prohibited without an exemption or exception.
2. Vineyards are allowed in all zoning districts within the MST area except within all Residential Single (RS) districts (RS:UR, RS:B-1, RS:B-2, and RS:B-5) (approximately 290.1 acres) and areas zoned Planned Development (PD) (approximately 761.8 acres).
3. New vineyards that involve conversion of any drainage by 5.5 percent or greater (Hardman Creek and Tulucay Creek in the MST area) or are located on slopes averaging more than 15 percent, requiring submittal of an erosion control plan application which is subject to environmental review.
4. In addition to any floodway and floodplain regulations, construction of structures, accessory structures, earthmoving, grading or removal of vegetation or agricultural uses of land are prohibited within stream setbacks pursuant to County Conservation Code Section 18.108.025.
5. The County requires that all vineyard projects demonstrate that there is adequate water available prior to approval.
6. Additional constraints may be identified by County required technical reports/surveys, including geotechnical reports, biological reconnaissance and floristic surveys, archaeological study, and Phase I water availability studies.

While project implementation would not induce or alter growth trends in Napa County, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to occur. Secondary effects related to development under the Napa County General Plan, including development of vineyards, are summarized in **Table A5-20**. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

Mitigation Measures (Napa County)

The environmental effects of growth identified as significant and unavoidable in the Napa County General Plan are land use conflicts, increased traffic impacts, impacts to public utilities and services, including water supply, and fire and law enforcement services. The mitigation provided for these impacts include a series of efforts and policies to be implemented.

1. ***Land Use*:** Evaluate rezoning and development to avoid conversion where feasible. Where conversion is unavoidable long-term preservation of equal acreage of other farmland must be designated. To mitigate the need for more housing units, an approval process for multi-family residential projects will be established to allow development based on criteria. Land use conflicts with the airport and surrounding areas will be mitigated by prohibiting incompatible uses in the ALUC "D" Zone.
2. ***Biological Resources*:** Conduct biological resources evaluation, preserve habitat and connectivity of habitat, provide replacement habitat, restore and replant native plant species, and implement a Noxious Weed Ordinance. Require fencing standards for vineyard developments. Establish a Fisheries monitoring Program, a policy that requires erosion control and restoration of impacted areas, and prohibits stream bed and streambank alteration or removal of riparian vegetation.
3. ***Noise*:** Establish noise-related compatibility criteria, notify residents of agricultural-related noises, evaluate the potential for noise related conflict, reduce vibration sensitive development, and establish buffers for Syar Quarry. Conduct noise analysis when road improvements may cause impacts to sensitive receptors to prescribe barrier features. Acceptable noise levels will be established for sensitive receptors (schools, hospitals).

TABLE A5-20: IMPACTS ASSOCIATED WITH NAPA COUNTY GENERAL PLAN IMPLEMENTATION

Napa County
Significant But Mitigable Impacts
1) Conversion of State designated Important Farmland.
2) Loss of County designated agricultural land*
3) Impacts to roadway safety and emergency access.
4) Conflicts with existing alternative transportation policies and programs, and increased demand on transit services.
5) Additional demand for parking facilities due to new development and reduction of parking from roadway changes.
6) Disturbance or loss of special status plant and animal species.
7) Obstruction to or loss of wildlife movement, migratory corridors, and plant dispersal opportunities.
8) Conflict with Conservation regulations, ordinances and policies.
9) Impacts from soil erosion, sedimentation on water quality, and hydrologic alteration to fisheries.
10) Groundwater interactions with surface water flows.
11) Direct and indirect impacts to wildlife habitat.
12) Compatibility between noise and land use.
13) New development exposure to groundborne vibration.
14) Compatibility of aircraft noise and land use.
15) Short-term emissions from grading, construction, and operation.
16) Impacts from equipment related to construction and agricultural odors
17) Impacts from release and exposure to hazardous materials
18) Airport hazards.
19) Interference with an adopted Emergency Response of Evacuation Plan.
20) Disturbance or loss of sensitive biotic communities
21) Impacts of development on water quality associated with proposed ministerial projects.
22) Well competition and adverse well interference.
23) Structural damage from expansive soils.
24) Changes to drainage patterns leading to increased runoff, streambank erosion, hillside erosions, and flood risk.
25) 100-year flooding risks.
26) Impacts to archeological and paleontological resources.
27) Increased wastewater and need for sewer treatment and conveyance.
Significant and Unavoidable Impacts
1) Conflicts with agricultural zoning and Williamson Act Contracts.
2) Population, housing, and employment increases exceed ABAG projections.
3) Increased travel demand, insufficient level of road service, regional traffic growth.
4) Loss of sensitive biotic communities.
5) Increased volume of project-generated traffic noise.
6) Impacts from roadway improvements on noise-sensitive uses.
7) Consistency with air quality regulations.
8) Conflicts with particulate matter attainment efforts.
9) Exposure to air toxic contaminants.
10) Increase in long-term atmospheric greenhouse gas emissions.
11) Impacts from seismic groundshaking on infrastructure
12) Impacts from seismic related ground failure.
13) Landslide damage to roadway infrastructure.
14) Subsidence and settling.
15) Reduction in groundwater supply and increased overdraft conditions.
16) Impacts to historic architectural resources.
17) Need for fire protection and emergency services.
18) Need for additional law enforcement officers and facilities.
19) Impacts to water supply and water quality.

TABLE A5-20: IMPACTS ASSOCIATED WITH NAPA COUNTY GENERAL PLAN IMPLEMENTATION (CONTINUED)

Napa County (continued)
Significant and Unavoidable Impacts (cont.)
20) Increased demand for park and recreational facilities.
21) Degradation of scenic resources and the visual character of the area.
22) Increase in daytime glare and nighttime lighting.
Less Than Significant Impacts
1) Agricultural and urban interface conflicts.
2) Division of established communities and land use conflicts.
3) Conflicts with relevant land use plans, policies of regulations.
4) Job Housing Balance.
5) Displacement of a substantial number of persons or housing.
6) Increase in project-generated noise sources
7) Increase in project-generated construction noise
8) Carbon monoxide concentration along roadways.
9) Impacts from transport of hazardous materials
10) Wildland fire.
11) Structural damage from expansive soils.
12) Septic system capacity.
13) Increased mineral extraction.
14) Increased non-point source pollution from urban runoff.
15) 100 year flood hazard areas
16) Need for solid waste services.
17) Impacts to electric and natural gas resources.
18) Need for social services.
19) Structural damage from expansive soils.

NOTES:

* Impact to County designated agricultural land would be considered Significant and Unavoidable if Measure J for the new growth boundary for American Canyon and redesignation of lands near Angwin is successful.

SOURCE: Napa County, 2008a

4. ***Public Services*:** Implement policies that require new facilities and adequate access to facilities, consultation with emergency agencies, compliance with fire safety standards and evacuation plans, and availability of alternate power sources to be used during emergencies. Require new development to verify access to wastewater services prior to approval of the project. Require dedication of more open space and trails, and require fees from new developments.
5. ***Traffic*:** Establish standards for adequate level of service on roads, prepare traffic analyses prior to approving projects, require new development to pay a fair share for road improvements, encourage alternative forms of transportation, provide transit facilities for future development, and provide bicycle lanes during road improvements. The General Plan will require that new development be concentrated so densities can support development of transit services and pedestrian facilities. Parking is also identified as a significant impact, but mitigation that requires adequate parking to meet demand and replacement parking will minimize the impact.
6. ***Air Quality*:** Include provision of incentives energy efficient forms of transportation, enforcement tailpipe emissions standards, evaluation of project-specific air quality impacts, and establishment of emission standards for county vehicles. Other measures include dust control, demolition requirements for lead and asbestos, construction emission control measures, and buffer and control requirements for odor and Toxic Air Contaminants.
7. ***Visual resources*:** Continue the Napa County Viewshed Protection Program, retention of trees along public roadways, implement the standards for transmission lines, and requirements for new development

to be compatible with visual standards. Landscape improvements along roadways, limited street lighting, reduce use of reflective building materials mitigate the impacts from glare and night lighting.

8. ***Cultural resources*:** Conduct onsite cultural resource investigations by qualified archaeologists, followed by immediate notification to the County Planning Department.
9. ***Hydrology*:** Implement the Napa County Conservation Regulations and a Stormwater Management and Discharge Control Ordinance, develop an erosion control plan, establish water quality monitoring, enforce stream setbacks, and implement best management practices for agricultural and resources practices (i.e. forestry practices, etc.). To reduce competition of groundwater well use, hydrogeologic studies must be conducted for all new wells to determine effect on adjacent wells. No new wells will be drilled in areas that experience saltwater intrusion. Expansion of land uses that could result in drainage impacts and runoff require mitigation measures like a policy that requires post-development conditions not to increase flood events, comply with the Basin Plan, and include drainage improvements to prevent increased flooding impacts.
10. ***Geology*:** Require seismic, geologic evaluations for all projects. Projects that are located in susceptible areas will not be approved. Measures to prevent damage from landslides include planting on slopes, grading requirements for slopes over 15 percent, hillside lot requirements.
11. ***Utilities*:** Impacts to water supply would also be significant and unavoidable despite requiring new projects to demonstrate adequate water supply availability. Since the General Plan does not prohibit continued vineyard development, standards for mitigation of impacts to biotic communities and oak woodlands should be established, impacts to wetlands should be avoided, and stream setbacks will be required

City of Petaluma

Under NBWRP Phase 2, 2,278 AFY of recycled water would be available offset irrigation demand in the eastern portions of the City, Oakmead Business Park and agricultural customers along Lakeville Highway. Between 2015 and 2040, surface water supplies from SCWA to the City of Petaluma are anticipated to increase from 7,020 AFY to 9,757 AFY, or approximately 2,737 AFY (City of Petaluma 2015 UWMP).

NBWRP Phase 2 would provide 935 AFY to urban irrigation uses within the City service area. This represents approximately 34 percent of the projected 2,737 AFY of additional water supply projected as necessary to meet demands associated with buildout under the approved General Plans within its service area. Because recycled water is included within the water supply planning of SCWA and the City of Petaluma, and NBWRP Phase 2 would be consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban growth within the City of Petaluma.

While project implementation would not induce or alter growth trends in the City of Petaluma, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to occur. **Table A5-21** summarizes the secondary effects of growth identified under the City of Petaluma General Plan EIR. A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided.

Mitigation Measures (City of Petaluma)

Mitigation Measures provided in the City of Petaluma General Plan EIR (2006) are described below.

1. ***Hydrology*:** Use flood terracing in the Corona and Denman Reaches, maintain surface water drainage swales along Highway 101, install flap gates or valves to eliminate the backflow of surface waters from the east side of Highway 101 to the west side, and increase berm heights that presently protect residential areas such as Leisure Lake and along Corona Creek between Youngstown and Petaluma Estates Mobilehome Parks; the continuation of zero-net fill and when appropriate, zero-net runoff, within the Development Code; creation of flood terrace improvements; provide a 100-year base flood elevation to determine minimum floor elevations.
2. ***Noise*:** Implementing construction best management practices (BMPs) to reduce construction noise levels.

TABLE A5-21: IMPACTS ASSOCIATED WITH CITY OF PETALUMA GENERAL PLAN IMPLEMENTATION

City of Petaluma
Significant But Mitigable Impacts
1) Increase drainage flows as a result of impervious surfaces, thereby altering the existing drainage patterns.
2) Overload storm drain system capacity or require expansion of existing or construction of new facilities.
3) Expose people or structures to risk of existing flooding hazards, or may place structures which could impede or redirect flood flows.
4) Construction activities generate noise levels that exceed the City standards.
Significant and Unavoidable Impacts
1) Unacceptable level of service (LOS) at study intersections.
2) Generate increased local traffic volumes in the Planning Area that would result in a substantial increase to existing exterior noise levels that are currently above the City standards.
3) Result in population levels that could conflict with the Bay Area 2005 Ozone Strategy
Less Than Significant Impacts
1) Conversion of some farmland to nonagricultural uses.
2) Increased demand for transit service.
3) Provision of secure and safe bicycle parking may be inadequate.
4) Increased demand for motor vehicle parking.
5) Decrease of parkland per 1,000 residents.
6) Generate additional elementary and secondary school enrollment within all the school districts serving Petaluma.
7) Requires police and fire protection that exceeds current staffing and facilities.
8) Requires emergency preparedness that may exceed the capabilities of the existing programs.
9) May increase risk from wild land fires due to the proximity of development to open areas of grassland or chaparral.
10) May increase water demand that may exceed available supply.
11) Need to expand new wastewater treatment facilities, the construction of which may cause significant environmental effects.
12) Result in wasteful, inefficient, or unnecessary consumption of energy by residential, commercial, industrial, or public uses.
13) Require the need for additional energy facilities, the construction of which could have significant environmental impacts.
14) Cause a substantial increase in transportation energy consumption due to the projected increases in trips associated with future population and employment growth.
15) Result in increased demand for solid waste disposal at the County landfill.
16) Degrade water quality.
17) Increase depletion of groundwater supply or substantially interfere with groundwater recharge.
18) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
19) Expose people or structures to strong seismic groundshaking or seismicrelated ground failure.
20) Subject to risk from settlement and/or subsidence of land, lateral spreading, or expansive soils, creating substantial risks to life or property.
21) Result in soil erosion.
22) Result in substantial adverse effects on special status fish species or their habitat.
23) Result in substantial adverse effects on California Brackishwater Snail or its habitat.
24) Result in substantial adverse effects on the salt marsh harvest mouse or its habitat.
25) Result in substantial adverse effects on special status bat species or their habitat.
26) Result in substantial adverse effects on American badger or its habitat.
27) Result in substantial adverse effects on western pond turtle, California tiger salamander, foothill yellowlegged frog, California redlegged frog, or their habitat.
28) Result in substantial adverse effects on nesting raptor species or their habitat.
29) Result in substantial adverse effects on California black rail bird, San Pablo song sparrow, Saltmarsh common yellow throat or other special status bird species.
30) Result in substantial adverse effects on oak woodland and special status plant species or their habitat.
31) Adversely affect riparian areas, wetlands and/or “other waters of the United States.”
32) Interfere with the movement of fish or wildlife species.

TABLE A5-21: IMPACTS ASSOCIATED WITH CITY OF PETALUMA GENERAL PLAN IMPLEMENTATION (CONTINUED)

City of Petaluma (cont.)
Less Than Significant Impacts (cont.)
33) Conflict with the provisions of the Draft Santa Rosa Plain Conservation Strategy.
34) Exceed the City noise standards.
35) Generate and expose persons nearby to excessive groundborne vibration or groundborne noise levels.
36) Contribute substantially to an existing air quality violation.
37) Result in a cumulatively considerable net increase of criteria pollutants for which the region is in nonattainment under an applicable national or State ambient air quality standard.
38) Result in exposure of sensitive receptors to CO emissions.
39) Result in placement of sensitive land uses near potential sources of objectionable odors, dust, or toxic air contaminants.
40) Block views of Sonoma Mountain and ridgelines and/or alter the visual character of the hillsides.
41) New development and intensification along the Petaluma River could adversely affect the visual character of this natural resource.
42) Degrade the existing visual quality of the city through incompatibilities with existing development in scale and/or character.
43) Disrupt undiscovered archaeological resources.
44) Potential to impact sites of local historic importance and the overall historic setting of downtown.
45) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
46) Create a significant hazard to the public or the environment through reasonably foreseeable accidental release of hazardous materials into the environment.

SOURCE: City of Petaluma, 2006.

City of American Canyon

Under NBWRP Phase 2, City of American Canyon would provide 295 AFY of recycled water to the northern and western portions of City. Between 2015 and 2040, surface water supplies to the City of American Canyon are anticipated to increase from 2,976 AFY to 4,466 AFY, or approximately 1,490 AFY.

NBWRP Phase 2 would provide 295 AFY of recycled water within the City service area. This represents approximately 19 percent of the projected 1,490 AFY of additional water supply projected as necessary to meet demands associated with buildout under the approved General Plans within its service area. NBWRP Phase 2 would provide approximately 16 percent of the 1,862 AFY of recycled water identified as part of this identified water supply. Because recycled water is included within the water supply planning of the City of American Canyon, and NBWRP Phase 2 would be consistent with the amount of recycled water identified, provision of recycled water is not anticipated to affect the rate, timing, or distribution of urban growth within American Canyon.

While project implementation would not induce or alter growth trends in American Canyon, it would, as part of the overall water supply picture, enable secondary effects associated with development under the approved General Plans to occur. **Table A5-22** summarizes the secondary effects of growth identified under the City of American Canyon General Plan EIR (City of American Canyon, 1994). A discussion of mitigation measures and policies identified to reduce potential impacts to the degree feasible is also provided. The secondary effects of growth identified under the Napa County General Plan EIR are described above under the Napa SD discussion.

TABLE A5-22: IMPACTS ASSOCIATED WITH CITY OF AMERICAN CANYON GENERAL PLAN IMPLEMENTATION

City of American Canyon
Significant But Mitigable Impacts
1) result in several roadway link deficiencies and one unacceptable intersection in the PM peak hour.
2) increased demands on existing water supply and the need for water infrastructure improvements.
Significant and Unavoidable Impacts
1) Result in an irretrievable loss of currently undeveloped lands which are presently existing within the planning area.
2) Impacts related to the Theoretical Buildout place demands on the future balance of socioeconomics for American Canyon.
3) result in unacceptable capacity deficiencies at one location exceeding identified ADT impacts performance criteria.
4) Creation of additional demand for sworn officers over the life span of Plan to maintain acceptable level of police protection.
5) exceed the
6) AQMD's air pollution thresholds of construction related emissions for ROG, NOx, and SOx.
7) Air Quality emissions related to daily operations of the proposed General Plan will have significant and adverse impacts on long-term air quality in terms of NOx, SOx, and PM10
8) potential to affect species of animal or plant or the habitat of the species; diminish habitat for fish, wildlife, or plants; and result in cumulatively significant impacts.
9) Potentially significant impacts related to elevated magnetic fields are related to the placement of sensitive receivers to magnetic power lines.
Less Than Significant Impacts
1) result in increased population and consequently place additional demands on public services and infrastructure.
2) feasibly accounting for all of the regional need assessed on the City of American Canyon.
3) result in the installation of impermeable surfaces in currently undeveloped areas, thereby increasing local runoff volumes and velocities which may exceed the capacities of existing storm drains.
4) Generate additional demands on the local landfills.
5) Creation of additional demand and usage of natural gas, usage of electricity and construction of new distribution lines.
6) result in the generation of additional wastewater within the City that will increase demands on the existing collection and treatment facilities.
7) Creation of additional demands for firefighter personnel and equipment to maintain acceptable levels of service.
8) Increased demands for City parks and recreation facilities.
9) Place additional demands on the Napa Valley Unified School District.
10) increase the need for more library space.
11) result in short-term noise impacts associated with construction activities.
12) Increased traffic volumes will result in potentially significant noise impacts to residential areas located near the freeways, particularly in the areas surrounding Highway 29.
13) result in noise impacts in the currently undeveloped areas by increasing ambient noise levels by more than 5 decibels.
14) significant impacts due to landslides, faults, liquefaction prone deposits, and highly expansive soils may exist in areas of future development.
15) Loss of existing scenic views in the City.
16) significant impacts to archaeological resources which currently exist within the City and its planning area.
17) Potentially significant impacts to historic resources.

SOURCE: City of American Canyon, 1994.

Mitigation Measures (City of American Canyon)

1. ***Traffic/Circulation:*** Implementation of Plan Policies and adoption of the Circulation Plan
2. ***Water Resources*:** American Canyon shall pursue construction of an interconnection with the City of Vallejo.
3. ***Public Services:*** Require all site plans for new development within the City and Sphere of Influence to submit plans to the Napa County Sheriff's Department for review.

4. ***Air Quality:*** Require that new development utilize appropriate BAAQMD Best Available Control Technology (BACT) air quality mitigation measures and thresholds from BAAQMD's Air Quality and Urban Development: Guidelines for Assessing Impacts of Projects and Plans document.
5. ***Biology:*** Conduct an extensive biological survey for each subarea, including the preparation of maps, and update this data annually through brief surveys on each subarea. Conduct an onsite assessment to determine if sensitive habitats exist on site. All riparian corridors shall be protected by an adequate buffer with a minimum 100-foot protection zone from the edge of the tree, shrub, or herb canopy. Habitat linkages shall be a major consideration and receive regional study, and shall precede subarea and project design.
6. ***Energy:*** Restrict uses within power line easement to "passive" uses such as open space, community gardens, vacant open space and commercial storage. Restrict placement of residences and schools within 100 feet from edge of right-of-way for 100-110 kilovolt (kV) lines and 150 feet from 220-230 kV lines or establish a building setback to the 1 mG magnetic field level, whichever is greater. Require PG&E, when line improvements are necessary, to implement new industry accepted technologies to reduce the exposure and emissions of EMF's.

Appendix 6
Alternatives

6.4.2 Significant Effects

Chapter 3, Environmental Consequences, presents the impact analysis for the project alternatives, which are summarized here by component in **Table A6-1**. No significant and unavoidable environmental impacts are anticipated for projects under any of the alternatives considered. Based on the analysis presented in Chapter 3, implementation of the Proposed Action could result in significant short-term construction and long-term operational impacts to aesthetics, air quality, biological resources, cultural resources, energy, hazards and hazardous materials, water quality, surface water, groundwater, land use, noise, public services and utilities, recreational facilities, and traffic. The impacts would be reduced to a less-than-significant level by mitigation measures presented in Chapter 3. Following is a summary of the significant, but mitigable, environmental impacts identified per resource area that are considered in the evaluation of the alternatives to identify those that can avoid or reduce the environmental effects and still meet the basic project objectives.

With the exception of an option for Napa SD's Soscol Covered Storage project, there are no significant and unavoidable impacts anticipated for the Proposed Action. Therefore, the alternatives are compared by assessing the impacts under each alternative to demonstrate environmental superiority. In general, the magnitude of significant impacts would be in proportion to the extent of facilities required under each of the alternatives. Greater infrastructure involves greater construction activities or construction over a larger area for a longer duration, as well as a greater extent of operational activities. **Table A6-2** summarizes the potentially significant, but mitigable, impacts identified. In general, impacts would be the least for the least for the No Action Alternative, which has the least amount of infrastructure, and greatest for the Storage Alternative, which has the greatest amount of infrastructure.

Geology

As discussed in **Section 3.2, Geology, Soils, Mineral Resources, and Paleontological Resources**, development of any elements of the Proposed Action, Storage Alternative, or No Action Alternative would be required to adhere to California Building Code (CBC) requirements that include the preparation of a site-specific geotechnical investigation by a State-licensed geotechnical engineer. Engineering recommendations included in the project engineering and design plans for construction of the various elements would be reviewed and approved as a condition of permit approval by the host jurisdiction. With adherence to CBC requirements for any alternative or elements, there would be no difference in the potential for a geologic unit or soil to become unstable as a result of a project or that could potentially result in a geological or soil failure for reasons caused or exacerbated by the Proposed Action, Storage Alternative, or No Action Alternative. Due to the lack of presence of mineral and paleontological resources, none of the alternatives would affect these resources.

Surface Hydrology

Based on the analysis conducted in **Section 3.3, Surface Hydrology,** potentially significant impacts under all the alternatives, including exposure of new facilities to flooding, increased impervious surface area, and alteration of storm flow patterns, would occur in proportion to the amount of facilities required under each alternative. The impacts would be mitigated to a less-than-significant level with incorporation of recommended mitigation measures. There would be no significant and unavoidable impacts on surface hydrology.

Table A6-3 summarizes the number of stream crossings for the No Project, No Action, Proposed Action and Storage Alternatives. The Storage Alternative would have the highest number of stream crossings (34), while the Proposed Action would include 16 stream crossings. As noted in Section 3.3, impacts to stream channels would be avoided through implementation of trenchless technologies.

TABLE A6-1: SUMMARY OF PROJECT COMPONENTS UNDER THE ALTERNATIVES

Project Components	No Project	No Action	Proposed Action	Storage Alternative
Distribution Pipelines (in miles)				
Novato SD	--	1.12	1.12	2.92
SVCSD	--	--	2.2	2.2
MMWD	--	--	1.1	1.1
Napa SD	--	--	0.1	9.3
Petaluma	--	8.0	11.4	11.6
American Canyon	--	1.7	3.9	3.9
Total Pipeline	**0.0**	**10.8**	**09.8**	**31.0**
Pump Station (in horsepower)				
Novato SD	--	--	--	5-
SVCSD	--	--	--	50
MMWD	--	--	50	50
Napa SD	--	--	--	300
Petaluma	--	--	--	--
American Canyon	--	--	--	--
Total Pump Stations	**0.0**	**0.0**	**50**	**405**
New Recycled Storage (acre-feet)				
Novato SD	--	--	--	150
SVCSD	--	--	--	49
MMWD	--	--	0.08	0.2
Napa SD	--	--	10.0	610
Petaluma	--	--	--	300
American Canyon	--	--	--	--
Total New and Existing Storage	**0.0**	**0.0**	**10.1**	**1,109**
WWTP Treatment Upgrades (million gallons per day)				
Novato SD	--	--	0.85	1.7
SVCSD	--	--	--	--
MMWD	--	--	0.2	0.2
Napa SD	--	--	1.7	1.7
Petaluma	--	--	2.12	2.12
American Canyon	--	--	--	--
Total Tertiary Treatment Capacity Increase	**0.0**	**0.0**	**4.87**	**5.72**
Project Yield (acre-feet per year)				
Novato SD	--	880	1,166	1,602
SVCSD	--	--	200	298
MMWD	--	--	153	153
Napa SD	--	--	811	1,911
Petaluma	--	223	2,278	2,578
American Canyon	--	84	277	277
Total Potable Offset	**0.0**	**1,187**	**4,885**	**6,819**

SOURCE: Brown and Caldwell, 2017.

TABLE A6-2: SIGNIFICANT, BUT MITIGABLE, IMPACTS FOR PROPOSED FACILITIES UNDER THE NO ACTION, PROPOSED ACTION, & STORAGE ALTERNATIVES

Temporary/ Construction-Related Impacts	Long-Term Impacts
1. Erosion-related water quality impacts or loss of topsoil. 2. Increased potential for fuels and hazardous material release into surface water, groundwater, or soils. 3. Disruption of stream crossings and sensitive habitats. 4. Dewatering that could result in discharge of turbid waters into the storm drain systems/ creeks. 5. Dust and wind-generated wind erosion 6. Temporary emissions of criteria pollutants. 7. Disturbance to recreational facilities. 8. Impacts to scenic corridors and visual character. 9. Disruption of utilities and public services (i.e., schools). 10. Disturbance of historical or cultural sites, including from ground borne vibration. 11. Increase in noise levels and vibration. 12. Exposure to and/ or release of hazardous chemicals. 13. Effect on emergency plans and response times of emergency providers. 14. Need for assistance in traffic management and effects to alternative transportation. 15. Light trespass. 16. Use of fuels. 17. Wildland fire hazard.	1. Increased surface area of impervious surfaces. 2. Permanent impact to visual character. 3. Alteration of stream courses. 4. Reduction in stream flows. 5. Increased exposure of the public and structures to flooding. 6. Increased stormwater runoff. 7. Increases to ambient noise. 8. Increase in light pollution. 9. Exacerbating risk of flooding due to sea level rise. 10. Permanent impact to roadway surfaces.

SOURCE: ESA, 2017.

Project objectives include enhancement of local and regional ecosystems, which can be partially achieved by reducing the treated wastewater discharge to surface water. As shown in **Table A6-3,** the Storage Alternative would distribute the most recycled water for beneficial use (6,838 AFY), resulting in an equivalent reduction in projected 2025 treated effluent discharge of approximately 17 percent. The Proposed Action would provide 4,902 AFY of recycled water for beneficial use (4,902 AFY), resulting in an equivalent reduction in projected 2025 treated effluent discharge of approximately 13 percent. The No Action Alternative would distribute the least amount of recycled water for beneficial use (1,205 AFY), resulting in an equivalent reduction in projected 2025 treated effluent discharge of approximately 3 percent.

The potential for the number of new facilities that could be affected by sea level rise is summarized in **Table A6-3**. Both the Storage Alternative and Proposed Action Alternative include facilities located in areas that could be affected by sea level rise. Due to its smaller scale, the No Action Alternative would largely avoid placement of facilities within areas that could be affected by sea level rise, although even the No Action Alternative includes two such facilities.

Both the Proposed Action and Storage Alternative would meet the project objectives regarding offsetting demands on potable supplies, enhancing local and regional ecosystems, and improving local, regional and State water supply reliability by recovering 13 and 17 percent, respectively, of projected 2025 treated effluent flows generated by WWTPs in the region. The No Action Alternative, while having reduced number of facility related impacts, would only recover 3 percent of projected 2025 treated effluent flows.

TABLE A6-3: COMPARISON OF ALTERNATIVES BASED ON SURFACE HYDROLOGY

	No Project Alternative	No Action Alternative	Proposed Action	Storage Alternative
Stream Crossings	0	15	16	34
Recycled Water (AFY)	0	1,187	4,885	6,819
Discharge (2025) (AFY)	38,098	36,893	33,196	31,260
Number of Elements Potentially Affected by Sea Level Rise	0	2	7	8

SOURCE: Brown and Caldwell 2017, ESA, 2017

Groundwater

The analysis in **Section 3.4, Groundwater,** determined that proposed facilities would not significantly affect shallow groundwater levels and natural groundwater fluctuations. The Proposed Action would maintain or even slightly increase groundwater levels over the long-term due to pumping offsets; therefore, the impact on structures or flooding patterns would be less than significant. The use and storage of recycled water would not significantly affect groundwater quality for potable and agricultural uses. Similarly, impervious surfaces constructed under the Proposed Action would not significantly affect groundwater recharge in the action area. There would be no significant and unavoidable impacts on groundwater.

Both the Proposed Action and Storage Alternative would meet the project objectives regarding offsetting demands on potable supplies, enhancing local and regional ecosystems, improving local, regional and State water supply reliability, and supporting the sustainable management of groundwater basins by providing 4,885 AFY (13%) and 6,819 AFY (17%) respectively, of projected 2025 treated effluent flows generated by WWTPs in the region. This would assist in the offset of groundwater pumping of groundwater in the Sonoma Valley and MST groundwater basins. The No Action Alternative would only recover 1,187 AFY (3%) of projected 2025 treated effluent flows.

Water Quality

As discussed in **Section 3.5, Water Quality,** the impacts would include short-term construction-related stormwater impacts and long term effects related to recycled water use such as incidental runoff and beneficial impacts such as reduced discharge to surface water and water reuse for habitat restoration. The level of short term construction impacts would be commensurate with the cumulative amount of ground disturbance and new impervious surface area per alternative. The Storage Alternative includes six additional storage reservoirs which would result in approximately 79 acres of disturbance. Therefore, the Storage Alternative would have the greatest potential for short-term impacts to water quality. These impacts would be reduced for the Proposed Action, which does not include the same level of storage. The No Action Alternative would have the least potential for construction related effects to water quality, due to the limited facilities constructed.

The Proposed Action and Storage Alternative would meet the project objectives relating to enhancing local and regional ecosystems, improving local, regional and State water supply reliability, and supporting the sustainable management of groundwater basins by providing recovery of 4,885 AFY (13%) and 6,819 AFY (17%) respectively, of projected 2025 treated effluent flows generated by WWTPs in the region. The No Action and No Project Alternatives would not meet these objectives, as they would provide recovery of 1,187 AFY (3%) and 0 AFY (0%) of projected 2025 treated effluent flows generated in the region.

Biological Resources

As discussed in **Section 3.6, Biological Resources,** the impacts to biological resource would include short-term construction-related impacts to wetlands, streams, and riparian habitat and special-status species such as California red-legged frog and burrowing owl, salt marsh harvest mouse, Ridgeway's rail, fish and invertebrates. The level of short term construction impacts would be in proportion to the size and number of facilities implemented under each alternative. Based on this comparison of significant impacts on biological resources, the level of significant short-term construction impacts would be similar under the Proposed Action and Storage Alternative, although the Storage Alternative would result in construction of additional storage facilities totaling approximately 72 acres of disturbance. The No Action Alternative and No Project Alternative would have the least facilities, and therefore, the least amount of physical impact to biological resources.

Land Use

Based on the analysis conducted in **Section 3.7, Land Use,** the Proposed Action would not divide existing communities or conflict with land use plans and policies; there would be no impact. On the whole, the Proposed Action, the Storage Alternative and the No Action Alternative would support planning goals in the region at varying levels by providing a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region. The No Project Alternative would not support these objectives, and the No Action Alternative, would not meet these objectives due to the relatively limited amount of recycled water reuse (1,187 AFY).

All of the elements of the Proposed Action and No Action Alternative would be constructed and operated within existing treatment facilities, roadways, or other developed areas. These alternatives would not impact the agricultural use of important farmland. Under the Storage Alternative, all of the storage projects would permanently convert active farmland and Farmlands of Local Importance to storage facilities, resulting in loss of approximately 72 acres. This would constitute a total conversion of 72 acres out of a total of over 984,400 acres of farmland classified as important, etc., in the three-county region. This would be a conversion of approximately 0.0001 percent in the region; therefore, this Storage Alternative impact would be considered less than significant.

Traffic

As discussed in **Section 3.8, Transportation and Traffic,** the impacts of the Proposed Action, No Action, and Storage Alternatives would include short-term construction-related impacts to level of service, circulation patterns, alternative transportation, parking demand, accident potential, and wear and tear on haul routes. Mitigation measures addressing these potential impacts would be required for the Proposed Action and Storage Alternative, reducing impacts to a less-than-significant level. The nature of short-term construction impacts would be similar under these alternatives, while there would be no impacts under the No Project Alternative. The level of short term construction impacts would be in proportion to the size and number of facilities implemented under each alternative; the Storage Alternative would have the greatest level of short-term impact to transportation and traffic, followed by the Proposed Action, No Action Alternative, and No Project Alternative.

Air Quality

As discussed in **Section 3.9, Air Quality,** implementation of the Proposed Action, Storage Alternative, and No Action Alternative would result in impacts related to generation of criteria pollutants and toxic air contaminants. The No Project Alternative would not result in these impacts, as no facilities would be constructed. Impacts attributable to the No Action Alternative and Proposed Action would be mitigated to a less-than-significant level. However, as it has the greatest number of facilities in number and size, the Storage Alternative would have

significant and unavoidable impacts, as it would potentially exceed air quality standards and/or conflict with the Bay Area Air Quality Management District's 2017 Clean Air Plan.

Greenhouse Gas Emissions

As discussed in **Section 3.10, Greenhouse Gas Emissions,** impacts would include an increase in greenhouse gas emissions and climate change-related conditions. While the No Project Alternative would not contribute to an increase in the region's emissions, the Proposed Action, Storage Alternative and No Action Alternative would result in such an increase. When amortized over 30 years, emissions from the Proposed Action, Storage Alternative and No Action Alternative would not exceed 100,000 tons per year and would not trigger Prevention of Significant Deterioration (PSD) or Title V permitting under 40 CFR Part 52.

Noise

As discussed in **Section 3.11, Noise,** the potentially significant, but mitigable impacts would include short-term construction-related noise and vibration. The level of short term construction impacts would be in proportion to the size and number of facilities implemented under each alternative. The level of short-term construction impacts and long-term operational noise would be similar under the Proposed Action and Storage Alternative, as the location of the Storage Alternative reservoirs would not be near sensitive receptors, and all pump stations would be enclosed. The No Project Alternative would not result in any impacts, as no facilities would be constructed. The No Action Alternative involves the least amount of facilities and, therefore, would result in the least amount of construction related noise. However, these two alternatives would not meet the stated project objectives.

Hazardous Materials

As discussed in **Section 3.12, Hazardous Materials,** under all the alternatives except the No Project Alternative and the impacts would be in proportion to the size and number of facilities implemented under each alternative. Impacts could include the potential for short-term construction-related exposure or accidental release of materials common to construction. Additionally, some facilities would be located within wildland fire hazard areas. The Proposed Action and Storage Alternative, would have similar potential for impact, with the Storage Alternative proposing the most facilities in terms of number and size. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Public Services and Utilities

Based on the analysis conducted in **Section 3.13, Public Services and Utilities,** there could be significant impacts to public services under all the alternatives except the No Project Alternative and the impacts would be in proportion to the size and number of facilities implemented under each alternative. Significant temporary and long-term impacts to public services as a result of construction and operational activities, such as increased response times for emergency service providers, need for police and fire assistance during construction, and temporary disruption to utility services, would occur in proportion to the size and number of facilities proposed under each alternative, however impacts would be mitigated to a less-than-significant level. There would be no significant and unavoidable impacts to public services and utilities. Implementation of the Proposed Action and Storage Alternative would have a beneficial impact to the offset of potable water supply use.

Cultural and Tribal Cultural Resources

Based on the analysis conducted in **Section 3.14, Cultural Resources,** the Proposed Action would not significantly affect the setting of historic or known cultural resources. There could be significant impacts to unidentified human remains and buried archaeological materials in sensitive areas from construction activities

and ground-borne vibration under all the alternatives, except the No Project Alternative and the impacts would occur in proportion to the number and size of the facilities implemented under each alternative. However, the significant impacts would be mitigated to a less-than-significant levels after implementation of the recommended mitigation measures, with the exception of Option A for the Napa SD Soscol Covered Storage project. Implementation of that option would be a significant and unavoidable impact to cultural or tribal resources. Aside from that, the Proposed Action and Storage Alternative, would have similar potential for impact, with the Storage Alternative proposing the most facilities in terms of number and size. Implementation of additional storage would disturb an additional 72 acres, increasing the potential for impact. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Recreation

Based on the analysis conducted in **Section 3.15, Recreation,** there could be significant impacts to recreational resources under all the alternatives except the No Project Alternative and the impacts would be in proportion to the size and number of facilities implemented under each alternative. However, incorporation of the recommended mitigation measures would reduce the impacts to recreational resources to a less-than-significant level. Thus, there would be no significant impacts on recreation. The Proposed Action and Storage Alternative, would have similar potential for impact, with the Storage Alternative proposing the most facilities in terms of number and size. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Aesthetics

As discussed in **Section 3.16, Aesthetics,** the impacts would include short-term construction-related impacts to scenic vistas, scenic corridors, impacts from new sources of light, and permanent impacts to visual character. The level of significant short-term construction impacts and long-term effects would be similar under the Proposed Action and the Storage Alternative, with the Storage Alternative proposing the most facilities in terms of number and size, including additional storage facilities. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Energy Conservation

Section 3.17, Energy Conservation, considers the project impacts to energy supply, demand, and conservation. With application of mitigation measures applied to address air quality impacts, the Proposed Action and Storage Alternative would not have a significant and unavoidable impact by using fuel in an unnecessary, wasteful, or inefficient manner. Once in operation, these alternatives would require electricity for pumping and may require emergency generators to power facilities in the event of a power outage. Operation of the Storage Alternative projects and/or Proposed Action would not result in unnecessary consumption of energy and, while the projects would require a modest amount of electricity and fuel each year to operate, they would result in the displacement of potable water for recycled water at various locations in the North Bay that could result in a net decrease in electricity usage associated with the NBWRP Phase 2 compared to existing conditions. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Environmental Justice

Section 3.18, Environmental Justice, identifies minority and low-income populations that exist in the NBWRA Phase 2 area and evaluates the potential for this program to have a disproportionately high and adverse effect on those populations. Throughout the North Bay region, only San Rafael and American Canyon

were found to have census tracts which meet the criteria for "disadvantaged communities as defined by Executive Order 12898 and/or the California Water Code. With application of mitigation measures applied to address air quality impacts throughout the region, the Proposed Action and Storage Alternative were not found to have a disproportionately adverse effect on minority and low-income pollutions. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

With regard to increased water and sewer fees, the analysis acknowledged that the Proposed Action and the Storage Alternative could result in increased services fees. However, this increase would affect low-income populations throughout the NBWRA Phase 2 area and not be focused solely on the census tracts identified in San Rafael and American Canyon. Therefore, the effects of increased water and sewer fees would not be disproportionately high or adverse. Finally, the analysis also found that the Proposed Action and Storage Alternative would have beneficial effects for farmworker employment as they would provide a more reliable water supply for irrigation, thereby providing the opportunity for increased agricultural production. The Proposed Action and Storage Alternative, would have similar potential for impact, with the Storage Alternative proposing the most facilities in terms of number and size, including additional storage facilities. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Socioeconomics

Section 3.19, Socioeconomics, describes the increase in jobs, wages and salaries, and output in the regional economy, as part of the project impacts, which would occur in proportion to the number and size of facilities implemented under each alternative. Construction of the treatment plant upgrades, pipelines, pump stations, and storage reservoirs, would require employment of engineers, construction supervisors, and general construction laborers. These activities would result in economic effects, or increases in jobs, wages and salaries, and economic output in the regional economy. The magnitude of these increases would be commensurate with the number of facilities that comprise each alternative. There would be no adverse significant and unavoidable impacts to the regional economy under the individual alternatives.

The analysis in Section 3.16, Socioeconomics, also concluded that customer fees would increase as the project costs increase. As a basis of comparison between alternatives, notwithstanding that funding plans have not been formulated for any of the alternatives, the Storage Alternative would have the potential for the greatest adverse impact to disposable incomes because it is the most expensive of all the alternatives. The Proposed Action would have reduced potential for the adverse impact to disposal incomes compared to the Storage Alternative. The No Project Alternative would not include new facilities, and the No Action Alternative would have the least potential for impact; however, these alternatives would not meet the stated project objectives.

Appendix 8
Indian Trust Assets Request Form

Indian Trust Assets
Request Form (MP Region)

Submit your request to your office's ITA designee or to MP-400, attention Kevin Clancy.

Date:

Requested by (office/program)	Doug Kleinsmith
Fund	18XR0680B1
WBS	RX206710000000000
Fund Cost Center	2015200
Region # (if other than MP)	
Project Name	North Bay Water Reuse Program Phase 2
CEC or EA Number	
Project Description (attach additional sheets if needed and include photos if appropriate)	The proposed Federal Action is the provision of Federal funds by the Bureau of Reclamation under the Title XVI Program to NBWRA Member and Cooperating Agencies for the implementation of additional water recycling projects to provide recycled water for agricultural, urban, and environmental uses and to expand the recycled water system region-wide. The funding would go to City of Petaluma, Sonoma Valley County Sanitation District, Napa Sanitation District, City of American Canyon, Novato Sanitary District, and Marin Municipal Water District.
***Project Location (Township, Range, Section, e.g., T12 R5E S10, or Lat/Long cords, DD-MM-SS or decimal degrees). Include map(s)**	City of Petaluma: -122.64, 38.27 Sonoma Valley: -122.47, 38.28 American Canyon: -122.24, 38.17 Novato: 122.55, 38.09 Marin: -122.49, 37.95 Napa: -122.28, 38.23 See attached maps.

/s/ Doug Kleinsmith	Doug Kleinsmith	1-18-18
Signature	Printed name of preparer	Date

ITA Determination:

The closest ITA to the Petaluma proposed facilities is the Federated Indians of Graton Rancheria which is about 7 miles to the northwest.
The closest ITA to the Sonoma Valley proposed facilities is the Federated Indians of Graton Rancheria which is about 15 miles to the northwest.
The closest ITA to the American Canyon proposed facilities is the Lytton Rancheria which is about 16 miles to the southwest.
The closest ITA to the Novato proposed facilities is the Lytton Rancheria which is about 16 miles to the southeast.
The closest ITA to the Marin proposed facilities is the Lytton Rancheria which is about 9 miles to the southeast.
The closest ITA to the Napa proposed facilities is the Lytton Rancheria which is about 20 miles to the southeast.

See attached maps.

Based on the nature of the planned work it **does not** appear to be in an area that will impact Indian hunting or fishing resources or water rights nor is the proposed activity on actual Indian lands. It is reasonable to assume that the proposed action will not have any ITAs

K. Clancy	Kevin Clancy	1/19/2018
Signature	Printed name of approver	Date

Petaluma Facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West

Native American Lands FL

PDA

Rancheria

Miles
0 4 8 12 16

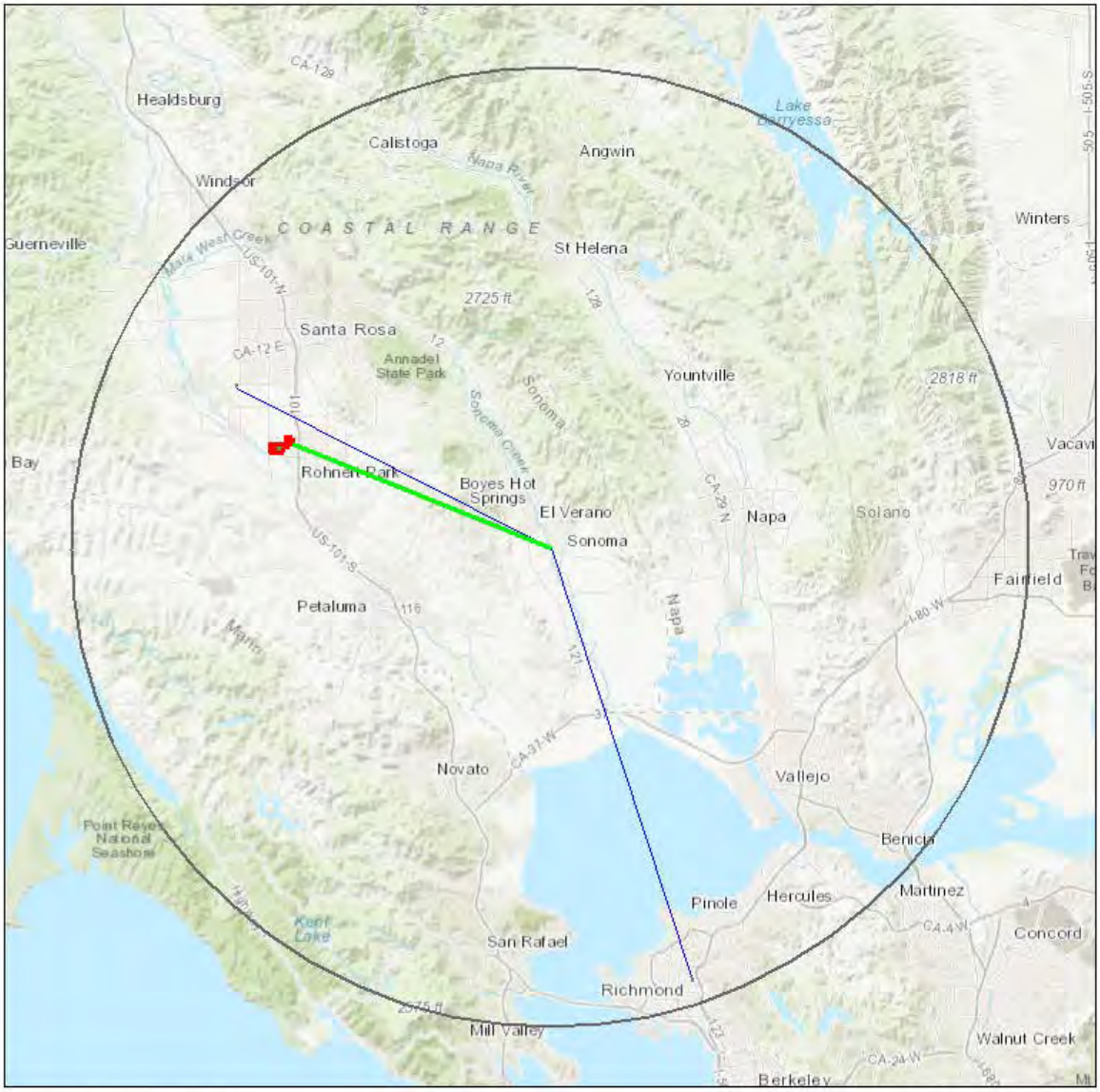
N

This map is provided as-is and may contain representations of property boundaries. It is intended for general reference only. None of the parties involved in preparing this map or data contained herein warrant or represent information to be complete and accurate, and cannot be held responsible for errors or omissions.

Map created by: U.S. Bureau of Reclamation
Date: 1/18/2018

Sonoma facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West



Native American Lands FL

PDA

Rancheria

Miles
0 4 8 12 16

N

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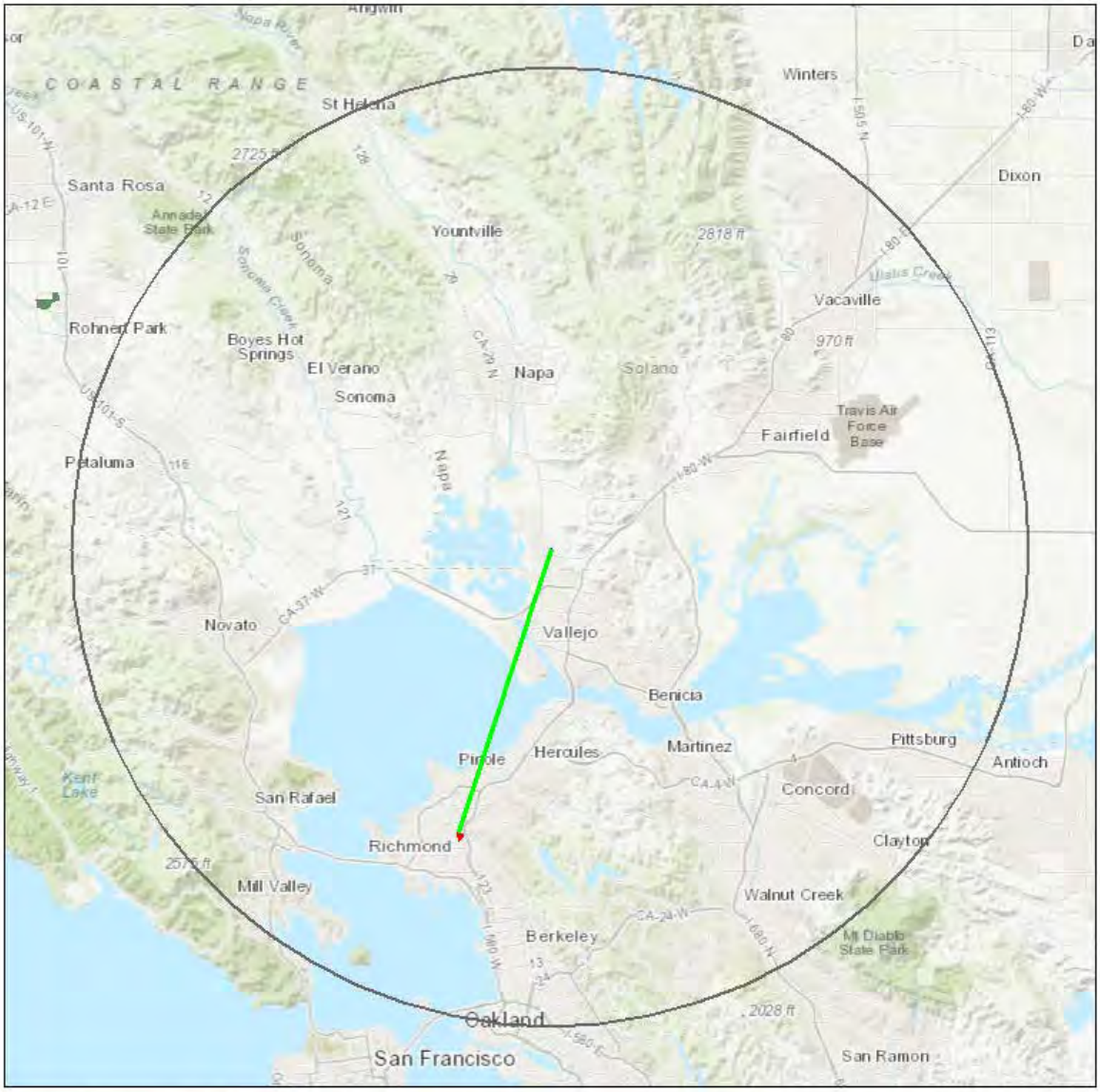
Map created by: U.S. Bureau of Reclamation
Date: 1/18/2018

American Canyon facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West



Native American Lands FL

PDA

Rancheria

Miles
0 4 8 12 16

N

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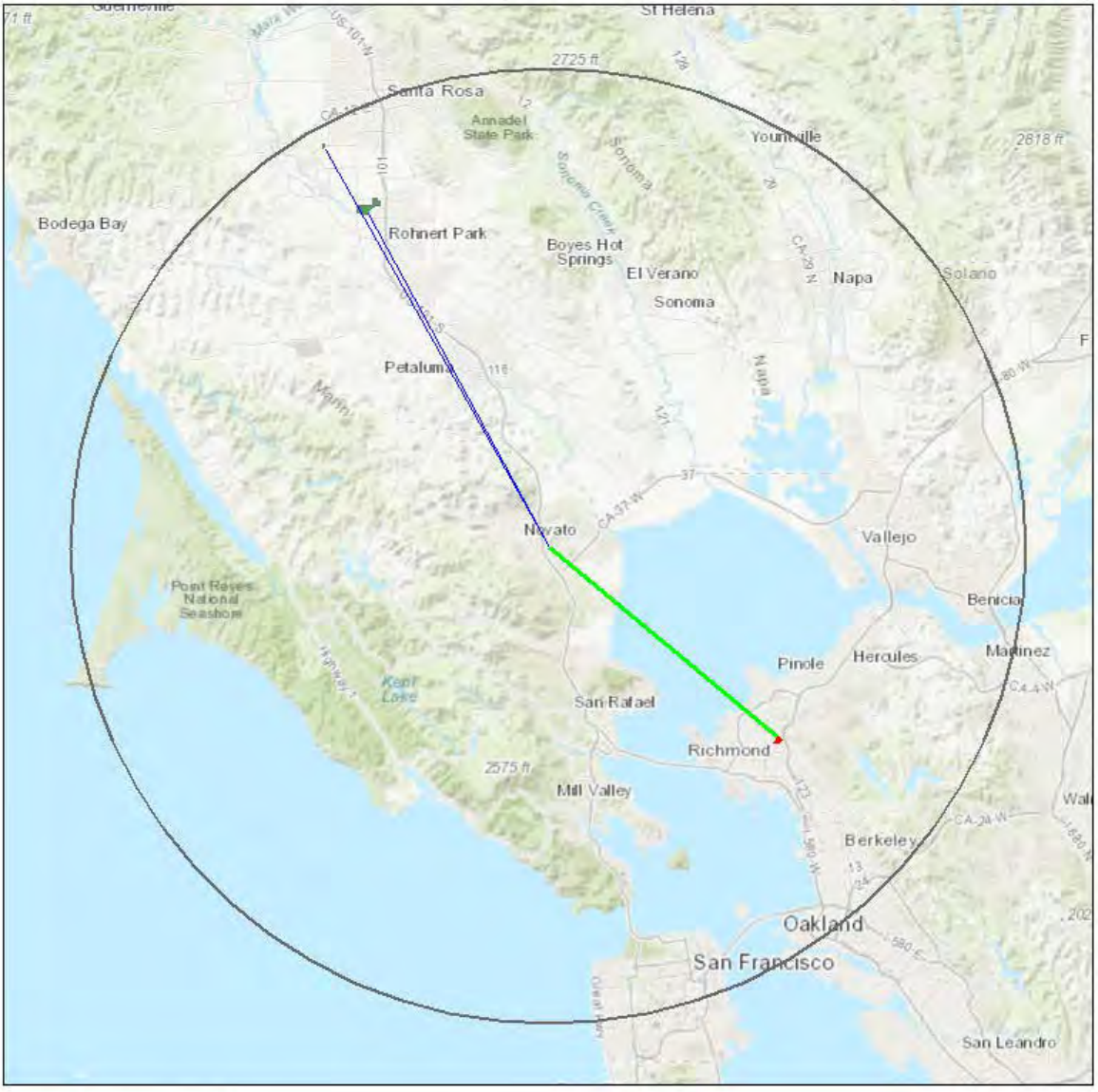
Novato facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West



Native American Lands FL

PDA

Rancheria

Miles
0 4 8 12 16

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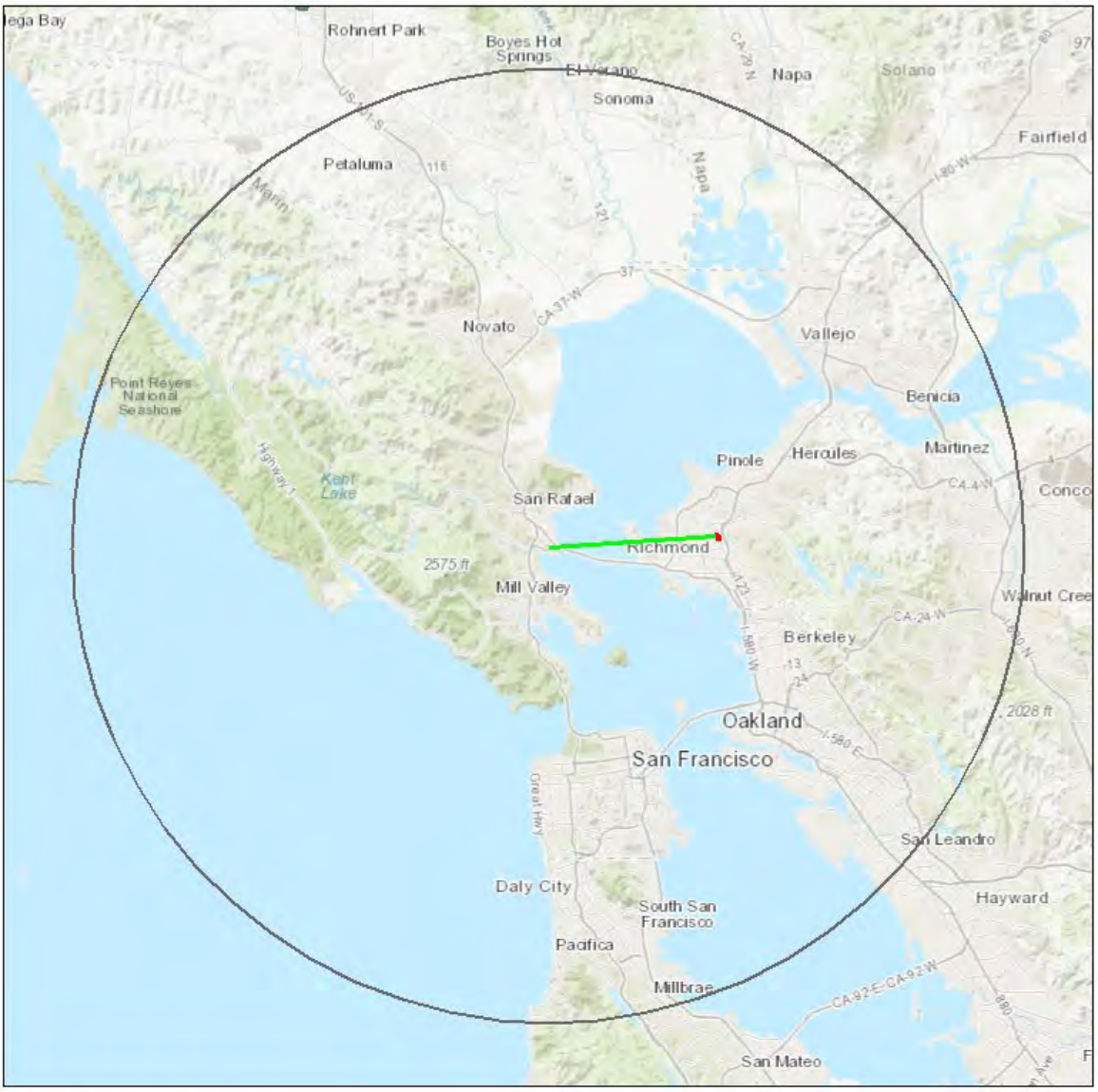
Marin facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West



Native American Lands FL

Rancheria

Miles
0 4 8 12 16

N

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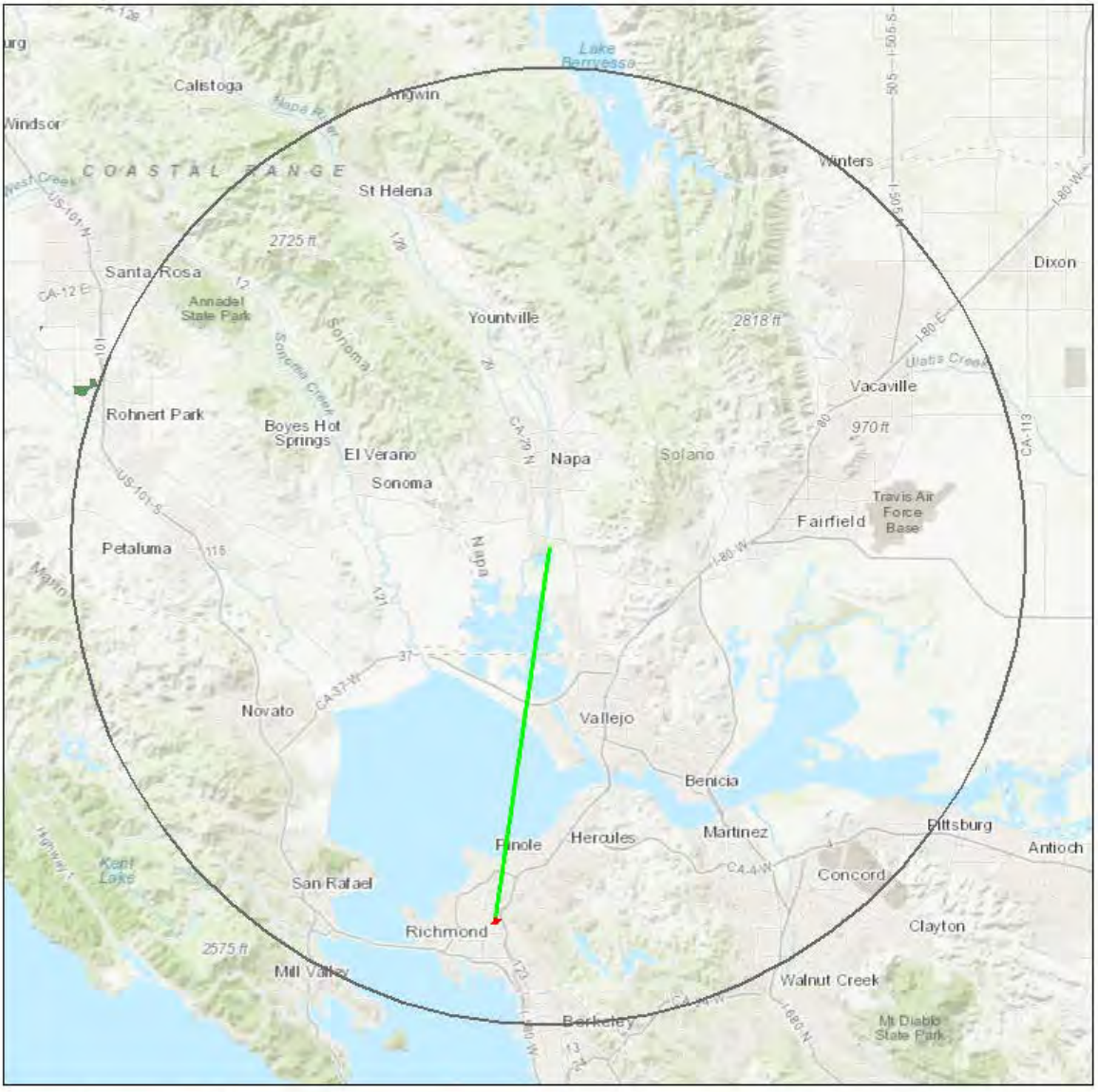
Napa SD Facilities, NBWRP Phase 2

RECLAMATION
Managing Water in the West



Native American Lands FL

PDA

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