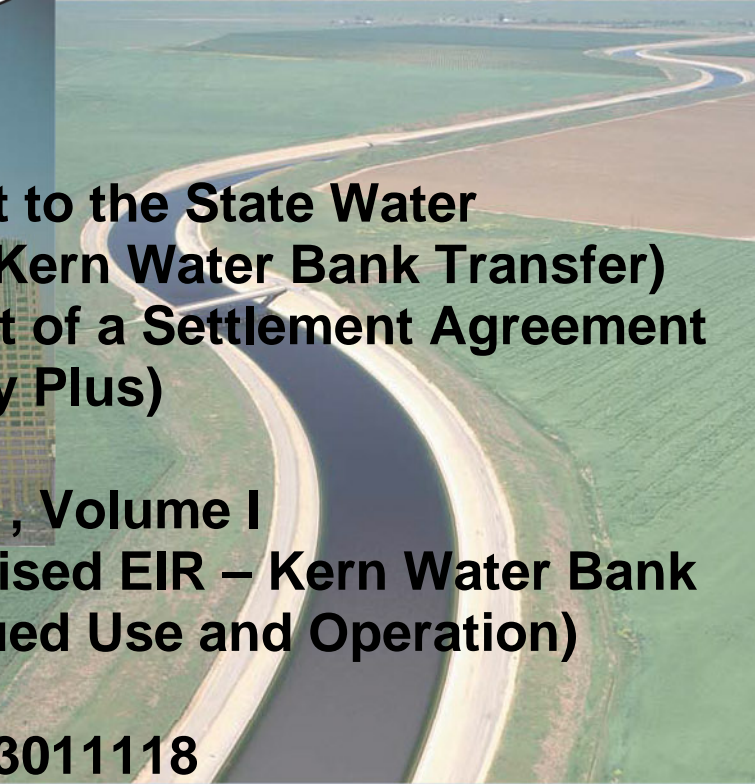





Draft Revised Environmental Impact Report



**Monterey Amendment to the State Water
Project Contracts (Including Kern Water Bank Transfer)
and Associated Actions as Part of a Settlement Agreement
(Monterey Plus)**

**Document A1, Volume I
(2016 Monterey Plus Draft Revised EIR – Kern Water Bank
Development and Continued Use and Operation)**

SCH#: 2003011118

**State of California
California Natural Resources Agency
Department of Water Resources**

April 2016

Prepared by:

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April 2016

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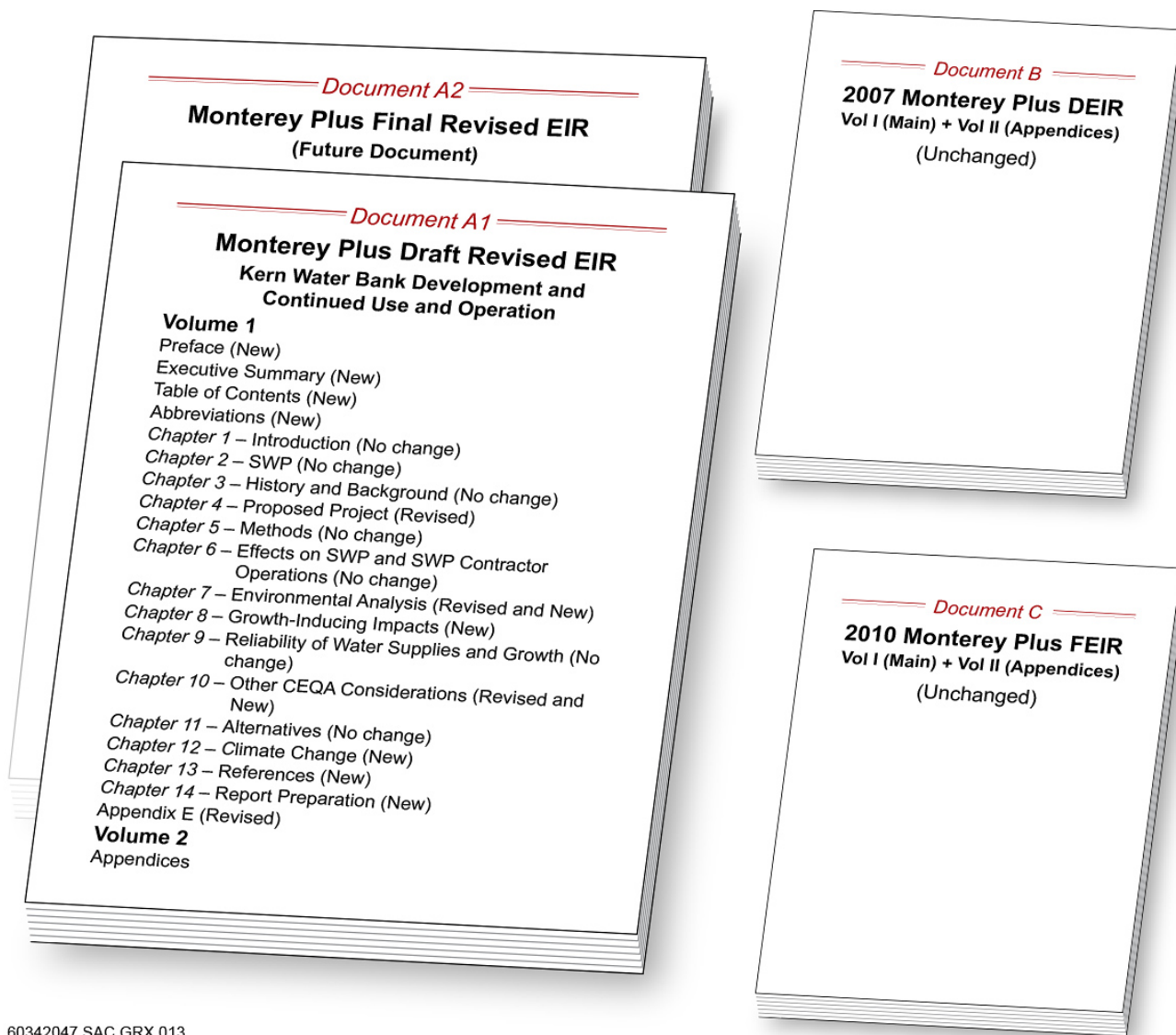
PREFACE

The California Department of Water Resources (Department), as the lead agency under the California Environmental Quality Act (CEQA), prepared the environmental impact report (EIR) for the *Monterey Amendment to the State Water Project Contracts (Including Kern Water Bank Transfer) and Associated Actions as Part of a Settlement Agreement (Monterey Plus)* (Monterey Plus EIR). The Department certified the Monterey Plus EIR on February 1, 2010. On May 5, the Department filed a Notice of Determination (NOD), explaining that it had determined, after review of the Monterey Plus EIR, to continue operating under the existing Monterey Amendment and the Settlement Agreement. The EIR evaluated the 1995 Monterey Amendment and 2003 Settlement Agreement, which address aspects of State Water Project long-term water supply contracts, including transferring ownership of approximately 20,000 acres of land known as the Kern Fan Element (KFE) from the Department to the Kern County Water Agency (KCWA). (KCWA, in turn, transferred the property to the Kern Water Bank Authority, who started operating the Kern Water Bank [KWB] on the property in 1997.)

Several parties challenged the adequacy of the Monterey Plus EIR under CEQA. In 2014, the Monterey Plus EIR was found by the Sacramento County Superior Court (Court) to comply with CEQA in all aspects except with respect to the development, use, and operation of the KWB. The Court specified that the Department is to correct the deficiencies and recertify the EIR without reopening the non-defective portions of the EIR. Upon recertification, only those portions of the revised EIR (REIR) that are new or changed shall be subject to challenge under CEQA by petitioners or other interested parties.

For these reasons, the Department has developed this three-volume Monterey Plus Draft REIR. Document A1 presents all the changes to the Monterey Plus EIR made as a result of the Department's reanalysis of the KFE property transfer and new analysis of the KWB development and continued use and operation. Since DWR decertified the Monterey Plus EIR, pursuant to the Court's order, the REIR also includes, without modification, the 2007 Draft EIR (Document B, including Volumes I and II) and the 2010 Final EIR (Document C, including Volumes I and II). Together, the three documents constitute the Monterey Plus Draft REIR (Figure P-1).

The focus of public review and comment should be on Document A1 since public comments will only be considered on the revised and new text, contained entirely within Document A1. Document A2, the Monterey Plus Final REIR, will be prepared in the future after receiving public comment on Document A1.



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Figure P-1. Monterey Plus Revised EIR Document Layout

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ABBREVIATIONS

ABBREVIATIONS

1995 KWB MOU	Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program
CEQA Guidelines	Guidelines for Implementation of California Environmental Quality Act
2009 CAS	2009 California Statewide Adaptation Strategy
2015 GAMAQI	<i>Guide for Assessing and Mitigating Air Quality Impacts</i>
°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per liter
µmhos	micromhos
µmhos/cm	micromhos per centimeter
AB	Assembly Bill
ADT	average daily traffic
AF	acre-feet
AFO	Analysis of Future Operations
AFO-BC	Analysis of Future Operations—Buildout Conditions
AFO-EC	Analysis of Future Operations—Existing Conditions
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
APEP	Advanced Pump Efficiency Program
APO	Analysis of Past Operations
ARCO	ARCO Corporate Environmental Remediation
As	arsenic
AST	aboveground storage tank
Ba	barium
BAAQMD	Bay Area Air Quality Management District
basin plan	water quality control plan
BAU	business-as-usual
bgs	below ground surface
BMP	best management practices
BOD	biochemical oxygen demand
B.P.	before present
BPS	Best Performance Criteria Standards
Ca	calcium
Cal EPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CAO	Cleanup and Abatement Order
CAP	Climate Action Plan
CARB	California Air Resources Board
CASGEM	California Statewide Groundwater Elevation Monitoring
CBC	California Building Standards Code
CCR	California Code of Regulations
Cd	cadmium
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife (previously known as the California Department of Fish and Game)
CDPH	California Department of Public Health
CDPR	California Department of Pesticide Regulation
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERS	California Environmental Reporting System
CESA	California Endangered Species Act

CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH ₄	methane
CHP	California Highway Patrol
Cl	chloride
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
COB	City of Bakersfield
COC	constituent of concern, chemical of concern
Corps	United States Army Corps of Engineers
Cr	chromium
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
Cr VI	hexavalent chromium
CTC	California Transportation Commission
CTR	California Toxics Rule
CUPA	California Unified Program Agency
CVC	Cross Valley Canal
CVP	Central Valley Project
CVRWQCB	California Regional Water Quality Control Board, Central Valley Region
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DBCP	dibromochloropropane
DDW	Division of Drinking Water
DEHP	di(2-ethylhexyl)phthalate
DEIR	draft environmental impact report
Delta	Sacramento-San Joaquin Delta
Department	California Department of Water Resources
DLR	detection limit
DOC	dissolved organic carbon
DOC	California Department of Conservation
DOGGR	California Department of Conservation, Division of Oil, Gas and Geothermal Resources
DOT	United States Department of Transportation
DTSC	California Department of Toxic Substances Control
DTW	depth to groundwater
DWR	California Department of Water Resources
DWR KWB Model	California Department of Water Resources Kern Water Bank Model
EC	electrical conductivity
EDB	ethylene dibromide
EDR	Environmental Data Resources, Inc.
EHSD	Environmental Health Services Department
EIR	environmental impact report
EKAPCD	Eastern Kern Air Pollution Control District
EMI	emissions inventory data
EPA	U.S. Environmental Protection Agency
F	fluoride
Fe	iron
FEIR	Final Environmental Impact Report
FESA	federal Endangered Species Act
FMMP	Farmland Mapping and Monitoring Program
Focused Air Quality Analysis	<i>Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area</i>
FR	<i>Federal Register</i>
ft	feet

GGERP	Greenhouse Gas Emissions Reduction Plan
GHG	greenhouse gas
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
GWE	groundwater elevation
HCO ₃	hydrogen carbonate
HCP	habitat conservation plan
I-5	Interstate 5
ID4	Irrigation District No. 4
Interim Plan or Interim Operations Plan	Interim Project Recovery Operations Plan regarding Kern Water Bank Authority and Rosedale–Rio Bravo Water Storage District Projects
IRWM	Integrated Regional Water Management
JOC	Joint Operations Committee
KCEHS	Kern County Environmental Health Services
KCEHSD	Kern County Environmental Health Services Department
KCFD	Kern County Fire Department
KCOG	Kern Council of Governments
KCWA	Kern County Water Agency
Kern IRWMP	Kern County Integrated Regional Water Management Plan
KFE	Kern Fan Element
KFMC	Kern Fan Monitoring Committee
KWB	Kern Water Bank
KWBA	Kern Water Bank Authority
KWBA Activities	Development and continued use and operations of the KFE property after it was acquired by the KWBA.
KWB HCP/NCCP	Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan
KWB Lands	KFE property after it was transferred to KCWA/KWBA
kWh	kilowatt-hours
L _{dn}	day-night average noise level
L _{eq}	equivalent energy noise level
LRA	Local Responsibility Area
LUFT	LUFT Engineers & Environmental Consultants, Inc.
LUST	leaking underground storage tank
M&I	municipal and industrial
MCL	maximum contaminant level
Mg	magnesium
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MHI	Median Household Income
Mn	managanese
Model	Groundwater Model
Monterey Agreement EIR	Final Programmatic Environmental Impact Report on the Monterey Agreement
Monterey IS and Addendum	Initial Study and Addendum to Monterey Agreement EIR of the Kern Water Bank Authority <i>Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan</i>
Monterey Plus EIR	Monterey Amendment to the State Water Project Contracts (Including Kern Water Bank Transfer) and Associated Actions as Part of a Settlement Agreement (Monterey Plus) Environmental Impact Report (EIR)
mph	miles per hour
MT	metric tons
MTBE	methyl tert-butyl ether
MT CO ₂ /yr	metric tons of carbon dioxide per year
MT CO _{2e} /yr	metric tons of carbon dioxide equivalent per year
MWh	megawatt-hours
MWh/yr	megawatt-hours per year
N	nitrogen
NA	not applicable
NCCP	natural community conservation plan
ND	not detected
NIH	National Institutes of Health

NL	notification level
NMFS	National Marine Fisheries Service
NOI	notice of intent
NOP	notice of preparation
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPI	negative potential impact
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NS	no sample/not sampled, no standard set
NTR	National Toxics Rule
NTU	nephelometric turbidity units
O&M	operations and maintenance
O ₃	ozone
OES	Office of Emergency Services
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pb	lead
pCi/L	picocuries per liter
PG&E	Pacific Gas & Electric Company
PM _{2.5}	particulate matter with an aerodynamic resistance diameter less than 2.5 micrometers
PM ₁₀	particulate matter with an aerodynamic resistance diameter less than 10 micrometers
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppb	parts per billion
ppm	parts per million
PRC	Public Resources Code
PRD	Permit Registration Document
PSEEP	Pump System Energy Efficiency Plan
PVC	polyvinyl chloride
RCIU	Rural Crime Investigation Unit
RCRA	Resource Conservation and Recovery Act
Reclamation	United States Bureau of Reclamation
REIR	revised environmental impact report
ROG	reactive organic gases
Rosedale or RRBWSD	Rosedale–Rio Bravo Water Storage District
RPS	Renewable Portfolio Standard
RTP	2014 Regional Transportation Plan/Sustainable Communities Strategy
RWD	report of waste discharge
RWQCB	regional water quality control board
SB	Senate Bill
SCH	State Clearinghouse
Scoping Plan	AB 32 Climate Change Scoping Plan
SDWA	Safe Drinking Water Act
Settlement Agreement	Settlement Agreement by and among Planning and Conservation League, Plumas County Flood Control and Water Conservation District, Citizens Planning Association of Santa Barbara County, Inc. and The State of California Department of Water Resources, Central Coast Water Authority, Kern Water Bank Authority and those State Water Project Contractors identified herein. May 5, 2003 (Monterey Plus EIR, Appendix D [REIR Document B, Volume II])
SGMA	Sustainable Groundwater Management Act
Sheriff's Office	Kern County Sheriff's Office
SHOPP	State Highway Operations and Protection Program
SIP	State Implementation Plan
SJFM	San Joaquin Facilities Management
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVAPCD GHG CEQA Guidance	<i>Final Staff Report Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act and Guidance for Valley Land-use Agencies in Addressing GHG</i>

	<i>Emission Impacts for New Projects under CEQA</i>
SLIC	Spills, Leaks, Investigations and Cleanup
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO ₂	sulfur dioxide
SO ₄	sulfate
SO _x	sulfur oxides
SQG	small-quantity generator
SR	State Route
SRA	State Responsibility Area
SSC	species of special concern
State TIP	State Transportation Improvement Program
SVOC	semivolatile organic compound
SVP	Society of Vertebrate Paleontology
SWAT	Solid Waste Assessment Test
SWF/LF	Solid Waste Facilities/Landfill Sites
SWP	State Water Project
SWPPP	storm water pollution prevention plan
SWRCB	California State Water Resources Control Board
SWRCB-DDW	California State Water Resources Control Board Division of Drinking Water
TAC	toxic air contaminant
TCE	trichloroethylene
TDS	total dissolved solids
TIP	Transportation Improvement Program
TMDL	total maximum daily load
TON	threshold odor number
TPH	total petroleum hydrocarbons
tpy	tons per year
TRPH	total recoverable petroleum hydrocarbons
TSM	Transportation System Management
Tulare Lake Basin Plan	<i>Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin</i>
UBC	Uniform Building Code
UCMP	University of California Museum of Paleontology
UIC	Underground Injection Control
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VCP	voluntary cleanup priority
VdB	vibration decibel
VOC	volatile organic carbons/compounds
WD	Water District
WDR	waste discharge requirement
WEAP	worker environmental awareness program
WMUDS	Waste Management Unit Database
WNV	West Nile virus
WPP	Water Purification Plant
WQCP	water quality control plan
WQO	water quality objective
WSD	Water Service District or Water Storage District

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INTRODUCTION/EXECUTIVE SUMMARY (NEW)

INTRODUCTION/EXECUTIVE SUMMARY (NEW)

ES.1 BACKGROUND OF THE REVISED EIR

In the 1980s, the California Department of Water Resources (Department or DWR) purchased approximately 20,000 acres of land overlying a groundwater basin in Kern County for the purpose of developing the property as one part of a larger imported-water groundwater banking project called the Kern Water Bank (KWB). As envisioned, the KWB would consist of a series of “elements,” which would be geographically separate banking projects that would be operationally integrated. The largest of these elements, the Kern Fan Element (KFE), for which efforts to develop occurred first, was to be followed by a number of local elements developed with several water districts in Kern County. The Department planned to develop the property it purchased into the KFE of the KWB, and the property is referred to as the KFE property. Uncertainties regarding the proposed groundwater storage facility ultimately led to the Department halting work on the KFE in 1994.

The Department transferred the KFE property to the Kern County Water Agency (KCWA) in 1995 as part of the Monterey Amendment, an amendment to the State Water Project (SWP) long-term water supply contract. KCWA, in turn, transferred the property to the Kern Water Bank Authority (KWBA). At the time of transfer, the Department had not put any SWP water into the KFE property for groundwater storage purposes.

An environmental impact report (EIR) on the Monterey Agreement was certified in 1995; challenged successfully in court; and led to the Department, the SWP contractors, and the plaintiffs executing the 2003 Settlement Agreement. As part of the 2003 Settlement Agreement, the Department, as lead agency under the California Environmental Quality Act (CEQA), prepared the EIR for the *Monterey Amendment to the State Water Project Contracts (Including Kern Water Bank Transfer) and Associated Actions as Part of a Settlement Agreement (Monterey Plus)* (Monterey Plus EIR). The Monterey Plus EIR evaluated the Monterey Amendment and Settlement Agreement, which included the KFE property transfer. The Department certified the Monterey Plus EIR on February 1, 2010. On May 5, the Department filed a Notice of Determination (NOD), explaining that it had determined, after review of the Monterey Plus EIR, to continue operating under the existing Monterey Amendment and the Settlement Agreement.

Several parties challenged the adequacy of the Monterey Plus EIR under CEQA. The Rosedale–Rio Bravo Water Storage District (Rosedale) and Buena Vista Water Storage District lawsuit challenged the EIR on the basis that it failed to analyze the use and operation of the KWB in compliance with CEQA. On March 5, 2014, the Sacramento County Superior Court (Court) issued its ruling in *Rosedale et al. v. California Department of Water Resources* (Sacramento County Superior Court Case No. 34-2010-80000703) (*Rosedale v. DWR*). The ruling found that the Monterey Plus EIR “fails to adequately describe, analyze, and (as appropriate) mitigate the potential impacts of the Project associated with the anticipated use and operation of the Kern Water Bank, particularly as to potential groundwater and water quality impacts.” On March 5, the Court also issued a ruling with regard to another lawsuit that challenged the adequacy of the Monterey Plus EIR on numerous grounds *in Central Delta Water Agency et al. v. Department of Water Resources* (Sacramento County Superior Court Case 34-2010-80000561) (*Central Delta v. DWR*). The Court found against plaintiffs on all grounds except with regard to the EIR’s analysis of the anticipated use and operation of the KWB.

On November 24, 2014, the Court issued a writ in *Rosedale v. DWR* and *Central Delta v. DWR* that specifies, among other things, that:

- (1) The use and operation of the Kern Water Bank is severed from the remainder of the Monterey Plus Project.
- (2) DWR shall vacate its February 1, 2010 certification of the Monterey Plus EIR.
- (3) DWR shall revise the Monterey Plus EIR's project description to include the development, use and operation of the Kern Water Bank as a water banking and recovery project, and revise the Monterey Plus EIR as necessary to correct the CEQA error with respect to the analysis of the potential impacts associated with the transfer, development, use and operation of the Kern Water Bank as a water banking and recovery project, as identified in the Court's Rulings on Submitted Matter (March 5, 2014). DWR's preparation of the revised Monterey Plus EIR shall be in accordance with the Court's rulings in the *Rosedale* and *Central Delta* matters.
- (4) DWR's May 2010 Monterey Plus Project decision as it related to the Kern Water Bank's use and operation will remain in place on an interim basis pending preparation of an adequate EIR. At the conclusion of the revised Monterey Plus EIR process, DWR (as lead agency) and KWBA (as responsible agency) shall make a new determination regarding whether to continue the use and operation of the Kern Water Bank by KWBA.
- (5) Except as otherwise provided in the writ, DWR may continue to implement the Monterey Plus Project and operate the State Water Project pursuant to the Monterey Amendment and the *PCL v. DWR* Settlement Agreement without limitation.
- (6) Until the writ is discharged, KWBA may continue to use and operate the Kern Water Bank lands as a water banking and recovery project subject to the following conditions: (i) existing Kern Water Bank operations shall be maintained, but not expanded; and (ii) the Kern Water Bank shall be subject to and operated in compliance with the "Interim Operations Plan" (see Appendix 7-5b) and the existing Kern Environmental Permits (as defined in the *PCL v. DWR* Settlement Agreement).
- (7) On or before December 31, 2014, DWR shall file an initial return reporting to the Court the steps and schedule it proposes to comply with this writ. Unless the Court orders otherwise for good cause, DWR must correct the deficiencies in the Monterey Plus EIR and recertify a revised Monterey Plus EIR by December 31, 2015 [the court extended the date to June 30, 2016 at the request of DWR].
- (8) DWR shall lodge with the Court: (i) the revised Monterey Plus EIR, (ii) DWR.'s certification of and findings, regarding same, and (iii) the record of proceedings for that administrative action. The Court will conduct a substantive review of the same for compliance with the writ. Only those portions of the revised Monterey Plus EIR that are new or changed shall be subject to challenge under CEQA by petitioners or other interested parties. No other challenges that were raised or could have been raised with respect to the Monterey Plus EIR may be raised in any challenge to the revised Monterey Plus EIR.

The Department decertified the EIR on December 11, 2014, and has prepared this Monterey Plus Revised EIR (REIR) in response to the Court ruling and in accordance with Public Resources Code Section 21168.9.

ES.2 PURPOSE OF THE REVISED EIR

The Monterey Plus EIR was found by the Court to comply with CEQA requirements in all aspects except with respect to the treatment of certain aspects of the KFE of the proposed project analyzed in the Monterey Plus EIR. The Court has specified that the Department is to correct the deficiencies and recertify the EIR without reopening the non-defective portions of the EIR. Therefore, the changed and new sections of the Monterey Plus REIR are limited in scope to the Court's directives regarding the KWB. More specifically, the Monterey Plus REIR is intended to:

- expand the project description to include the transfer of property known as the KFE property in Kern County, and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project (KWB activities).
- describe the environmental setting related to the KWB;
- discuss, analyze, and disclose all potentially significant and significant direct, indirect, and cumulative environmental impacts on the physical environment, particularly with respect to groundwater and water quality, associated with KWB activities;
- describe feasible mitigation measures, which could minimize any potentially significant and significant adverse impacts; and
- provide the public with information regarding the transfer of the KFE property and the development and continued use and operation of the KWB, and the opportunity to comment on the new information contained in the REIR to facilitate informed public participation and decision-making.

Following completion of the public review process for the Monterey Plus Draft REIR and preparation and circulation of the Monterey Plus Final REIR, the Department (as lead agency) will consider taking the following actions:

- certify the Monterey Plus Final REIR (CEQA Guidelines Section 15090),
- adopt a revised mitigation monitoring and reporting program with respect to any mitigation measures (CEQA Guidelines Section 15091[d]),
- adopt revised findings with respect to any significant environmental effects (CEQA Guidelines Section 15091),
- adopt a revised statement of overriding considerations with respect to any significant and unavoidable impacts (CEQA Guidelines Section 15093),
- make a new determination with KWBA (as a responsible agency) with regard to whether or not to continue the use and operation of the KWB by KWBA, after compliance with CEQA, and
- file a notice of determination (CEQA Guidelines Section 15094).

ES.3 SCOPE AND CONTENT OF THE REVISED EIR

SCOPE

The revised and new sections of the Monterey Plus REIR are limited in scope and focus on fully addressing and correcting previous EIR deficiencies with respect to evaluating environmental impacts associated with KWB transfer, development, and continued use and operation. While the REIR addresses all potentially significant environmental impacts, the focus is on groundwater and water quality impacts. The geographic area covered is primarily centered on KWB Lands. However, the

geographic area covered goes beyond the property boundaries as necessary to evaluate potentially significant impacts.

For these reasons, the Department has developed this three-volume Monterey Plus Draft REIR. Document A1 presents all the changes to the Monterey Plus EIR made as a result of the Department's reanalysis of the KFE property transfer and new analysis of the KWB development and continued use and operation. Since DWR decertified the Monterey Plus EIR, pursuant to the Court's order, the REIR also includes, without modification, the 2007 Draft EIR (Document B, including Volumes I and II) and the 2010 Final EIR (Document C, including Volumes I and II). Together, the three documents constitute the Monterey Plus Draft REIR. Figure P-1 at the end of the preface can be used to help the reader with the layout of the three documents of the REIR.

The focus of public review and comment should be on Document A1 since public comments will only be considered on the revised and new text, contained entirely within Document A1. Document A2, the Monterey Plus Final REIR, will be prepared in the future after receiving public comment on Document A1.

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five "elements" of the Monterey Amendment as follows:

- Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;
- Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts' Table A amounts;
- Transfer of property known as the "Kern Fan Element property" in Kern County;
- Water supply management practices; and
- Restructured water rates.

This REIR has changed the description of the Kern Fan Element property transfer to be:

- Transfer of property known as the "Kern Fan Element property" in Kern County, and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR.

To be consistent with the terminology of the Monterey Plus EIR, this REIR will use the following terms:

- Kern Fan Element (KFE) property when referring to the property before its transfer to the Kern County Water Agency/Kern Water Bank Authority (KCWA/KWBA);
- "Kern Water Bank" or KWB when referring to the groundwater bank;
- "KWB Lands" when referring to the property after its transfer to KCWA/KWBA; and
- "KWB activities" when referring to the development and continued use and operation of the KFE property after it was acquired by KWBA, as described in Sections V-VI of the Revised Appendix E.

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property. This REIR did not identify any

new impacts or changes to impacts caused by the transfer of the KFE property; therefore, the Monterey Plus EIR fully disclosed all impacts caused by the transfer of the KFE property. Consequently, this REIR is focused on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

CONTENT

This Draft REIR (Document A1) uses the same chapter numbering as the 2007 Monterey Plus DEIR (DEIR). Where appropriate, text from the DEIR related to KWB activities is copied in its entirety into the REIR with any changes shown in underline or ~~strikeout~~ mode. Where most, if not all of a chapter or section has been changed, the chapter or section is identified and included as a “new” section. No changes have been made to Chapters 1 (Introduction), 2 (State Water Project), 3 (History and Background), 5 (Methods), 6 (Effects of Proposed Project on SWP and SWP Contractors), 9 (Reliability of Water Supplies and Growth), and 11 (Alternatives) of the DEIR. In addition, no appendices from the DEIR have been changed except Appendix E (Study of Transfer, Development, and Operation of the Kern Water Bank), which has been updated and revised and is included at the end of REIR Volume 1 as Appendix E (Revised). Most resource sections are new, but the following resource sections are revised:

- Section 7.4 (Terrestrial Biological Resources)
- Section 7.9 (Recreation)
- Section 7.12 (Noise)
- Section 7.15 (Traffic and Transportation)

New groundwater modeling was conducted to evaluate KWB operations and provides an important basis for the evaluation of KWB operations on groundwater hydrology and water quality in Sections 7.1 and 7.2, respectively.

ES.4 LEAD, RESPONSIBLE, AND TRUSTEE AGENCIES

The Department is the lead agency under CEQA for preparing this REIR. KWBA is a responsible agency under CEQA for the KWB activities of the proposed project. Trustee agencies with potential jurisdiction by law over the KWB activities of the proposed project or the resources affected by it include the California Department of Fish and Wildlife, the California State Water Resources Control Board, Central Valley Regional Water Quality Control Board, the State Historic Preservation Office, and the Department of Food and Agriculture.

ES.5 PUBLIC REVIEW PROCESS FOR THE REVISED EIR

The public review process for the Monterey Plus Draft REIR is as follows:

1. This Monterey Plus Draft REIR is being circulated for public review and comment for a period of at least 45 days (April 28, 2016 – June 13, 2016).
2. The Department will provide responses in its Monterey Plus Final REIR only to public comments on the Draft REIR (Document A1), including all Document A1 appendices.
3. Written comments on this Draft REIR must be postmarked or delivered by June 13, 5:00 p.m., and addressed to:

Karen Dulik
 Environmental Program Manager
 California Department of Water Resources
 South Central Region Office
 3374 East Shields Avenue
 Fresno, CA 93726

Written comments can also be provided by 5:00 p.m. on June 13, by e-mail to Karen.dulik@ca.water.gov or by fax to Karen Dulik at (559) 230-3301.

Information about the Court rulings and the REIR process, including the Monterey Plus Draft REIR and the Monterey Plus Final REIR, will be posted on the Internet at:

<http://www.water.ca.gov/environmentalservices/montereyplusrevisedeir.cfm>

This site will also be used to post all public documents during the environmental review process and to announce upcoming public meetings.

During the public review period, the Monterey Plus Draft REIR, including its technical appendices and all pages from documents referenced in the Draft REIR, will also be available for review at the locations listed below.

Beale Memorial Library
 701 Truxtun Avenue
 Bakersfield, CA 93301

Colusa County Library
 738 Market Street
 Colusa, CA 95932

Mary L. Stephens Davis Branch
 Library
 315 E. 14th Street
 Davis, CA 95616

El Centro Public Library
 Community Center Branch
 1140 N. Imperial Ave.,
 El Centro, CA 92243

Fairfield Civic Center Library
 1150 Kentucky Street
 Fairfield, CA 94533

Fremont Library
 2400 Stevenson Boulevard
 Fremont, CA 94538

Hanford Branch Library
 401 North Douty Street
 Hanford, CA 93230

Los Angeles Public Library
 Central Library
 630 West 5th Street
 Los Angeles, CA 90071

Merced County Library
 Merced Branch
 2100 O Street
 Merced, CA 95340

Modesto Public Library
 1500 I Street
 Modesto, CA 95354

Napa Main Library
 580 Coombs Street
 Napa, CA 94559

Oroville Branch Library
 1820 Mitchell Avenue
 Oroville, CA 95966

Pleasant Hill Library
 1750 Oak Park Boulevard
 Pleasant Hill, CA 94523

Quincy Public Library
 445 Jackson Street
 Quincy, CA 95971

Red Bluff Library
 645 Madison Street
 Red Bluff, CA 96080

Redding Library
 1100 Parkview Avenue
 Redding, CA 96001

Riverside Public Library
 Main Library
 3581 Mission Inn Avenue
 Riverside, CA 92501

Sacramento Public Library
 Central Library
 828 I Street
 Sacramento, CA 95814

Norman F. Feldheym Central
 Library
 555 West 6th Street
 San Bernardino, CA 92410

San Diego Public Library
 Central Library
 330 Park Blvd.
 San Diego, CA 92101

Dr. Martin Luther King, Jr.
Library
150 East San Fernando Street
San Jose, CA 95112

Visalia Branch Library
200 West Oak Avenue
Visalia, CA 93291

California Department of Water
Resources
South Central Region Office
3374 E. Shields Avenue
Fresno, CA 93726

Central Library
40 East Anapamu Street
Santa Barbara, CA 93101

Willows Public Library
201 North Lassen Street
Willows, CA 95988

Cesar Chavez Central Library
605 N. El Dorado Street
Stockton, CA 95202-1907

Sutter County Library
Main Branch
750 Forbes Avenue
Yuba City, CA 95991

E. P. Foster Library
651 East Main Street
Ventura, CA 93001

Betty Rodriguez Regional Library
3040 N. Cedar Avenue
Fresno, CA 93703

Two public participation hearings will be held to allow the public to provide comments on the Draft REIR. For more information on the public hearings or on the Draft REIR, the Department's Karen Dulik may be contacted at the contact information presented above.

DATE, TIME, AND LOCATION OF PUBLIC HEARINGS ON THE DRAFT REVISED EIR		
Date	Time	Location
June 1, 2016	6-8pm	Woodward Park Library, 944 E. Perrin Avenue, Fresno, CA 93720
June 2, 2016	5-7pm	Clarion Hotel, 3540 Rosedale Highway, Bakersfield, CA 93308

Upon completion of the 45-day public review period, public comments and written responses to significant public comments will be prepared and incorporated into the Monterey Plus Final REIR, including any revisions to the Monterey Plus Draft REIR made in response to agency and/or public comments.

In compliance with the Court's November 2014 writ, the Department anticipates that upon taking actions described in section ES.2 above, the Department would then submit to the Court: the REIR, DWR's certification and findings regarding same, and the record of proceedings for that administrative action. DWR also anticipates that the Court, as ordered in the writ, "will conduct a substantive review of the same." Any person who may seek judicial review of the REIR should seek to participate in that proceeding.

ES.6 ENVIRONMENTAL IMPACTS

The impacts of KWB activities were analyzed for all relevant resource areas contained within the CEQA Guidelines, Appendix G, Environmental Checklist Form. These resources are: surface water and groundwater hydrology; surface water and groundwater quality; fisheries resources; terrestrial biological resources; visual resources; agricultural resources; air quality; geology, soils, and mineral resources; recreation; land use and planning; hazards and hazardous materials; noise; cultural and paleontological resources; public services and utilities; traffic and transportation; energy, and climate change. Cumulative impacts for these resource areas were also analyzed.

The results of the analysis are summarized in Table ES-1. Results for the periods 1996 through 2014 and for 2015 through 2030 (2035 for surface water and groundwater hydrology and quality) are listed separately. The levels of significance of the environmental impacts from KWB activities before and after

the application of mitigation measures are also shown in Table ES-1. Appendix 7-2a describes known areas of controversy.

Impacts - 1996-2014

Less-than-Significant Impacts

KWB activities had less-than-significant impacts between 1996 and 2014 on surface water and groundwater hydrology; surface water and groundwater quality; fisheries resources; terrestrial biological resources; visual resources; agricultural resources; air quality; geology, soils, and mineral resources; recreation; land use and planning; hazards and hazardous materials; noise; cultural and paleontological resources; public services and utilities; traffic and transportation; energy; and climate change.

Significant Impacts

KWB activities had no potentially significant or significant impacts between 1996 and 2014.

Significant and Unavoidable Impacts

KWB activities had no significant and unavoidable impacts between 1996 and 2014.

Impacts – 2015-2030

Less-than-Significant Impacts

KWB activities would have less-than-significant impacts between 2015 and 2030 on fisheries resources, visual resources, agricultural resources, air quality, recreation, land use and planning, noise, public services and utilities, and traffic and transportation.

Significant Impacts

KWB activities would have potentially significant or significant impacts before mitigation between 2015 and 2030 on surface water and groundwater hydrology (2015-2035); surface water and groundwater quality (2015-2035); terrestrial biological resources; geology, soils, and mineral resources; hazards and hazardous materials; cultural and paleontological resources; energy; climate change; and cumulative impacts related to growth.

Significant and Unavoidable Impacts

All significant and unavoidable impacts from KWB activities would be cumulative impacts related to growth. Because a portion of KWB water was provided by Improvement District No. 4 and Tejon-Castac Water District to several development projects, KWB activities would make a cumulatively considerable incremental contribution to the following cumulative impacts found to be significant and unavoidable for these projects (Impact 10.1-69):

- Aesthetics—Cumulatively considerable contributions to significant cumulative impacts related to visual changes from regional development, including along Interstate 5 and the Lebec Road interchange and introduction of new sources of light and glare.
- Air Quality and Climate Change—cumulative impacts on regional emissions of particulate matter with an aerodynamic resistance diameter less than 10 micrometers (PM₁₀), reactive organic gases (ROG), and nitrogen oxides (NO_x) that exceed San Joaquin Valley Air Pollution

Control District thresholds; and cumulatively considerable contributions to significant cumulative impacts associated with greenhouse gas (GHG) emissions that do not meet Assembly Bill 32 GHG reduction requirements.

- Agricultural Resources—Conversion of over 1,000 acres of Farmland of Statewide Importance to nonagricultural urban uses.
- Biological Resources—Cumulatively considerable contributions to significant cumulative impacts on the California condor population levels and range.
- Noise—Long-term exposure of sensitive receptors, and rural residences along Wheeler Ridge Road to increased noise from vehicular-related traffic and cumulatively considerable contributions to significant cumulative impacts on traffic noise that already exceed the County’s General Plan noise standards.
- Population and Housing—Cumulatively considerable contributions to significant cumulative impacts from increases in population and housing relative to existing conditions.
- Public Services—Cumulatively considerable contributions to significant cumulative impacts related to generation of solid waste that exceed landfill capacity.
- Transportation and Traffic—Cumulatively considerable contributions to significant cumulative impacts from increases in traffic at intersections and freeway segments from regional development.

There are no feasible mitigation measures or alternatives available to mitigate these impacts to less-than-significant levels. Moreover, the Department and KWBA lack the authority to approve or deny development projects or to impose mitigation to address significant environmental impacts associated with development projects; that authority resides with local cities and counties. See Chapter 8, Growth-Inducing Impacts, and Section 10.1, Cumulative Environmental Impacts, for further discussion of these impacts.

TABLE ES-1

MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation		
	1996-2014	2015-2030*		1996-2014	2015-2030*	
7.1 Surface Water and Groundwater Hydrology						
7.1-1	KWB Operations could potentially deplete groundwater supplies so that a net deficit in aquifer volume of stored groundwater would occur.	LTS	LTS	7.1-1 None required.	NA	NA
7.1-2	KWB operations could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).	LTS	PS	7.1-2 KWBA will establish a program that meets the following requirements in accordance with the Long-Term Project Recovery Operations Plan regarding the Kern Water Bank Project (2016 KWB Long-Term Operations Plan, Appendix 7-5c): A. Monitor and Report Groundwater Conditions to KWBA's Board of Directors and the Public 1) KWBA will monitor groundwater levels monthly, except during periods of no recovery when monitoring will occur at least quarterly. KWBA may rely on monitoring conducted by the Kern Fan Monitoring Committee to meet these requirements. 2) KWBA will report current groundwater levels to its Board of Directors at each monthly regular meeting, and will make the reports available to the public on its website (http://www.kwb.org/). 3) KWBA will regularly update its Groundwater Model (Model) to actual conditions and use the Model to project future groundwater conditions. KWBA will endeavor to use the best practicable science and latest information available in all modeling and technical matters. KWBA will report the results of its modeling to its Board of Directors and will make the results available to the public on its website	NA	LTS

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 PSU = Potentially Significant and Unavoidable

PS = Potentially Significant
 BE = Beneficial Effect

NI = No Impact
 NA = Not Applicable

TABLE ES-1

MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>http://www.kwb.org/). Recovery of banked groundwater in any calendar year beyond March 15 of that year shall not commence (or continue) until the Model has been run for projected KWB operations and the results have been reported to KWBA's Board of Directors and made available to the public. Because model data for a preceding year becomes available at different times in the following year, modeling at the beginning of any given year will necessitate estimating certain model input data for the preceding year (e.g., Kern River losses). These estimates will be replaced with actual data at regular intervals when the model is updated.</p> <p>B. Implement Proactive Measures (in addition to A above)</p> <ol style="list-style-type: none"> 1) KWBA will use its Model as a tool to evaluate potential groundwater impacts resulting from its project operations. The Model will be periodically run and updated as projected recovery plans become known or changed and the Model will assume such conditions as described in A.3. 2) The Model will be used to: <ol style="list-style-type: none"> a) Forecast groundwater levels. b) Forecast and predict the contribution of KWB Operations to groundwater level declines in the area. c) Determine water level conditions with "Without KWB Operations" for purposes of 		

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PS = Potentially Significant
 SU = Significant and Unavoidable

NI = No Impact
 NA = Not Applicable

TABLE ES-1

MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>evaluating the potential impact of “With KWB Operations”. The “Without KWB Operations” is the water level that would have been at any particular well location absent “KWB Operations.”</p> <p>d) Identify, based upon an analysis of “Without KWB Operations” versus “With KWB Operations,” if a negative potential impact (“NPI”) has or is likely to occur for which the measures described at D, E, and F may be operative. NPI is determined according to C.1 below.</p> <p>e) Forecast any localized areas for special attention and/or additional monitoring where groundwater levels will decline 30 or more feet below the “Without KWB Operations” groundwater level.</p> <p>f) Identify wells at risk of potential impacts during recovery operations.</p> <p>1) KWBA will provide notification on its website if the Model shows that an NPI has or is likely to occur, including steps that potentially affected landowners must follow if the landowner desires to make a claim to KWBA regarding potential well impacts due to KWBA’s recovery operations.</p> <p>C. Implement Triggers and Actions</p>		

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PS = Potentially Significant
 SU = Significant and Unavoidable

NI = No Impact
 NA = Not Applicable

TABLE ES-1

MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>The actions described in sections D, E, and F will be implemented in consultation with affected landowners/well owners that make a claim to KWBA regarding well impacts relating to KWBA's recovery operations and groundwater level declines, subject to the following:</p> <ol style="list-style-type: none"> 1) The trigger for mitigation shall be based upon an analysis and comparison of Model generated "Without KWB Operations" versus "With KWB Operations." When "With KWB Operations" are 30 feet deeper than the "Without KWB Operations" at an operative well, and the well has (or is expected to) experience mechanical failure or other operational problems due to declining water levels, a negative potential impact ("NPI") is triggered. If KWBA enters into a joint operations agreement with other water banks in the area, the depth at which a NPI is triggered shall provide an equivalent measure of potential impact as described in the 2016 KWB Long-Term Operations Plan (Appendix 7-5c). 2) For a well owner to be eligible for mitigation as provided below, the affected landowner shall submit a claim to KWBA, in accordance with the Government Claims Act, which shall, at a minimum, provide information concerning the condition of the well and casing and pumping equipment of the well, and other information that is relevant to the landowner's claim. Upon receipt of a claim, KWBA 		

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>shall use the Model (or the results of modeling as reported to the Board and the public) to determine whether an NPI exists at the landowner's well and respond with the appropriate action described below.</p> <p>3) KWBA will provide mitigation and/or compensation for the KWB Operations' contribution to the adverse impact. Mitigation and/or compensation is not required for a well owner's lack of well maintenance, normal wear and tear, depreciation, failure of well equipment, well casing degradation, etc., or other reasons not relating to KWB Operations.</p> <p>D. Implement Action for Agricultural Wells When Well Adjustment Is Needed and Available</p> <p>1) Trigger: When the Model predicts NPI for an operational agricultural well outside the current operating range of the pump but within the potential operating range of the well.</p> <p>2) KWBA actions will be completed within 60 days (provided that the land/well owner cooperates) from receipt of a claim as follows:</p> <p>a) Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline due to KWB operations. If needed:</p>		

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<ul style="list-style-type: none"> • Obtain right-of-entry permit and well data release from well owner. • Collect pump manufacturer data, the in-situ pump setting, and casing depth information. <p>b) Compare pump setting information with Model projected pumping water levels throughout the year to determine pump submergence levels and evaluate the necessity and feasibility of lowering the well pump to meet the landowner's needs to provide the least-cost short and long-term solution.</p> <p>c) Develop a cost estimate to complete the necessary work.</p> <p>d) Develop and submit a report to the landowner informing the landowner of the findings and proposed actions, including denying the claim because groundwater declines are not due to KWB operations.</p> <p>3) At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the NPI, using the Model to identify the well or wells that may require reduction or adjustment in pumping.</p> <p>4) If groundwater declines are due to KWB operations, unless D.3 occurs, once agreement is reached between KWBA and the landowner pursuant to</p>		

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>D.2.b and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.</p> <p>E. Implement Action for Agricultural Wells When Well Adjustment Is Unavailable</p> <p>1) Trigger: When the Model predicts NPI for an operational agricultural well outside the current and potential operating range of the well.</p> <p>2) KCWA actions will be completed within 60 days (provided that the land/well owner cooperates) from receipt of a claim as follows:</p> <p>a) Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline due to KWB operations. If needed:</p> <ul style="list-style-type: none"> • Obtain right-of-entry permit and well data release from well owner. • Collect pump manufacturer data, the in-situ pump setting, and casing depth information. <p>b) Identify water of an equivalent water quantity and quality suitable for agricultural uses for the affected landowner from an alternate source at no greater cost to the affected landowner or, with the consent of the</p>		

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>affected landowner, identify acceptable mitigation (for example, drill and equip a new well) to provide the least-cost short- and long-term solution, including an estimate to complete the necessary work.</p> <p>Develop and submit a report to the landowner informing the landowner of the findings and resulting proposed actions, including denying the claim because groundwater declines are not due to KWB operations.</p> <p>3) At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the NPI using the Model to identify the well or wells that may require reduction or adjustment in pumping.</p> <p>4) If groundwater declines are due to KWB operations, unless E.3 occurs, once an agreement is reached between KWBA and the landowner to provide mitigation pursuant to E.2.b and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.</p> <p>F. Implement Action for Domestic Wells</p> <p>1) Trigger: When the Model predicts NPI for a domestic well that is outside the current operating range of the pump but within the potential operating range of the well production.</p> <p>2) KWBA's actions will be completed within 60 days</p>		

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			(provided that the land/well owner cooperates) from receipt of a claim as follows: a) Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline. If needed: <ul style="list-style-type: none"> • Obtain right-of-entry permit and well data release from well owner. • Collect pump manufacturer data, the in-situ pump setting, and casing depth information. b) Identify availability and cost of a permanent connection to the nearest water service provider. c) Identify acceptable mitigation (for example, lower the domestic submersible pump bowl setting sufficient to restore and maintain service or drill and equip a new well that complies with applicable county well standards) to provide the least-cost short- and long-term solution, including an estimate to complete the necessary work. d) Develop and submit a report to the landowner informing the landowner of the findings and resulting proposed actions, including denying the claim because groundwater declines are not due to KWB operations.		

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			e) If necessary for emergency health and safety concerns, provide interim in-home water supplies within 14 days after receipt of the claim until a permanent mitigation action is implemented or the claim has been denied because groundwater declines are not due to KWB operations. 3) At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the NPI using the Model to identify the well or wells that may require reduction or adjustment in pumping. 4) If groundwater declines are due to KWB operations, unless F.3 occurs, once an agreement is reached for KWBA to provide mitigation pursuant to F.2.c above and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.		
7.1-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.	LTS	LTS	7.1-3. None required.	NA	NA

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
7.1-4 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.	NI	NI	7.1-4 None required.	NA	NA
7.1-5 Place within a 100-year flood hazard area structures that would impede or redirect flood flows.	LTS	LTS	7.1-5 None required.	NA	NA
7.1-6 Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or cause inundation by seiche, tsunami, or mudflow.	NI	NI	7.1-6 None required.	NA	NA
7.1-7 Raise groundwater levels sufficiently to substantially impact existing infrastructure (e.g., Cross Valley Canal).	LTS	PS	7.1-7 KWBA will implement the following measures in accordance with the KCWA and KWBA CVC Agreement (Appendix 7.5e): a) KWBA will monitor water levels frequency, evaluating groundwater conditions on a weekly/monthly basis. b) KWBA will coordinate water operations with KCWA. c) KWBA will manage recharge operations to help ensure that groundwater gradient is away from the CVC during shallow groundwater conditions. Should groundwater conditions develop that might induce piping behind the CVC's liner, KWBA will minimize recharge adjacent to the CVC either by	NA	LTS

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			reducing inflow to adjacent ponds or increasing the setbacks of adjacent ponds.		
7.1-8 Raise groundwater levels sufficiently to substantially impact existing infrastructure (e.g., septic systems).	LTS	LTS	7.1-8 None required.	NA	NA
7.1-9 Raise water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge.	LTS	LTS	7.1-9 None required.	NA	NA
7.2 Surface Water and Groundwater Quality					
7.2-1 KWB construction and maintenance activities could potentially change groundwater quality.	LTS	PS	7.2-1 KWBA will implement the following measures: a) Comply with Mitigation Measure 7.11-1(a). b) Comply with Mitigation Measure 7.8-1(a). c) Comply with Kern County Environmental Health Program under which new wells and well deepening, reconstruction, and destruction would be subject to permits requiring compliance. (see Section 7.0.4.1.6).	NA	LTS
7.2-2 KWB operations could mobilize contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations and potentially degrade groundwater quality.	LTS	PS	7.2-2 KWBA will implement the following measures: a) Comply with Mitigation Measure 7.11-3. b) Hazardous waste sites would be subject to the county public health department and/or the CVRWQCB oversight with the responsible parties (see Section 7.0.4.1.7). KWBA will cooperate with the regulatory agency(s) during the process and provide pertinent groundwater elevations and water	NA	LTS

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>quality data the regulatory agencies may request.</p> <p>c) On an annual basis, KWBA shall report the status of shallow groundwater level monitoring activities and water quality analysis in areas of contamination to the Kern Fan Monitoring Committee.</p> <p>d) KWBA will continue to monitor and evaluate the nature and extent of any current and future contamination and remediation within KWB Lands as follows:</p> <p>(i) For all evaluation and monitoring activities performed by third parties on KWB Lands, KWBA shall obtain reports and sampling data as soon as they become available. Monitoring and evaluation shall continue until verification by third party documentation, regulatory correspondence, and/or laboratory analysis is obtained that indicates soil or groundwater contamination has been remedied and no longer provides a threat to groundwater quality.</p> <p>(ii) On an annual basis, KWBA shall report the status of contamination for each issue and provide water quality data monitoring activities, where available, to the Kern Fan Monitoring Committee. Any newly discovered contamination shall be reported to the Kern Fan Monitoring Committee immediately.</p>		

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	1996-2014	2015-2030*		1996-2014	2015-2030*
7.2-3 The operation of oil and gas production wells within and surrounding KWB Lands could potentially degrade the quality of KWB water supplies.	LTS	PS	7.2-3 KWBA will implement the following measures: a) Prior to construction, identify all plugged and abandoned wells through agency contacts. This includes identification of abandoned wells through the DOGGR website, field verification of an abandoned well prior to construction, notifying DOGGR of intent to construct a recharge pond adjacent to or over an abandoned well. b) Modify excavation and grading activities to ensure the near surface seals and wellhead remain undamaged. c) If the top of an abandoned well or wellhead is damaged during pond construction, appropriate authorities (i.e., DOGGR, CVRWQCB, and/or Kern County Environmental Health) will be notified as to the nature and extent of the damage along with plans to repair the damage, as needed and in accordance with existing regulations.	NA	LTS
7.2-4 KWB recharge and recovery operations could potentially change water quality in the underlying aquifer as a result of lateral and vertical migration of low quality water within and outside the limits of the KWB.	LTS	LTS	7.2-4 None required.	NA	NA

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7.2-5 Kern Water Bank operations could potentially degrade water quality in the underlying aquifer as a result of an accumulation of salts during recharge activities.	LTS	LTS	7.2-5 None required.	NA	NA
7.2-6 KWB construction, development, and maintenance could potentially change water quality in the Kern River.	LTS	PS	7.2-6 KWBA will implement Mitigation Measures 7.2-1, 7.2-2, 7.2-3, 7.8-1(a) and (b), and 7.11-2.	NA	LTS
7.2-7 Continued use and operations of the KWB could potentially adversely impact water quality in surface water conveyance facilities and associated water supplies for downstream users.	LTS	LTS	7.2-7 None required.	NA	NA
7.3 Fisheries Resources					
7.3-1 KWB operations could potentially entrain or harm fish species of special concern.	LTS	LTS	None required.	NA	NA
7.4 Terrestrial Biological Resources					
7.4-3 Implementation of the KWB activities proposed project could potentially affect special-status terrestrial biological resources on the Kern Fan Element property <u>KWB Lands</u> due to changes in land use and management.	LTS	PS	7.4-3 KWBA will implement the following terms required of KWBA as specified in the 1997 Monterey IS and Addendum (Appendix 7-6a), 2016 KWBA Resolution, and KWB HCP/NCCP, including Appendix A (Kern Water Bank Operations Manual), Appendix C (Kern Water Bank Vegetation Management Plan, and Appendix D (Kern Water Bank Waterbird Management	NA	LTS

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			<p>Plan) (see Appendices 7-7a, 7-7b, 7-7c, and 7-7d, respectively):</p> <p>a) Biological Monitor A qualified biologist shall monitor all ground disturbing activities during construction in the Sensitive Habitat Sector and will oversee measures undertaken to reduce the take of listed species.</p> <p>b) Construction Practices</p> <p>i. Delineation of Disturbance Areas – During construction, KWBA shall clearly delineate disturbance area boundaries by stakes, flagging, or by reference to terrain features, as provided in the <u>KWB HCP/NCCP</u> directed by CDFG and USFWS to minimize degradation or loss of adjacent wildlife habitats during operation.</p> <p>ii. Signage – During construction, KWBA shall post signs and/or place fencing around construction sites to restrict access of vehicles and equipment unrelated to site operations.</p> <p>iii. Resource Agency Notification – At least 20 working days prior to initiating ground disturbance for project facilities in designated salvage/relocation areas, KWBA shall notify the Fresno Field Office of CDFG and the Sacramento Field Office of USFWS of its intention to begin construction activities at a specific location and on a specific date. The agencies will have ten working days to notify the KWBA of their intention to salvage or</p>		

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			<p>relocate listed species in the construction area. If KWBA is notified, it shall wait an additional five days to allow the salvage/relocation to take place.</p> <p>iv. Salvage and Relocation – KWBA shall allow time and access to USFWS and/or CDFWG, or their designees, to relocated listed species, at the Resource Agencies' expense, from construction areas prior to disturbance of areas that have been identified by the Resource Agencies as having known populations of the listed species they wish to salvage or relocate.</p> <p>v. Construction Site Review – All construction pipes, culverts, or similar structures with a diameter of three inches or greater that are stored at a construction site on the Kern Water Bank for one or more overnight periods shall be thoroughly inspected for trapped kit foxes and other animals before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a kit fox or other animal is discovered inside a pipe, that section of pipe shall not be moved or, if necessary, shall be moved only once to remove it from the path of construction activity until the animal has escaped.</p> <p>vi. Employee Orientation – An employee orientation program for construction crews, and others who will work on-site during construction, shall be conducted and shall consist of a brief consultation</p>		

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	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>in which persons knowledgeable in endangered species biology and legislative protection explain endangered species concerns. The education program shall include a discussion of the biology of the listed species, the habitat needs of these species, their status under FESA and CESA, and measures being taken for the protection of these species and their habitats as a part of the project. The orientation program shall be conducted on an as needed basis prior to any new employees commencing work on the Kern Water Bank. Every two years or at the beginning of construction for the Supply/Recovery canal, a refresher course will be conducted for employees previously trained. A fact sheet conveying this information shall also be prepared for distribution to all employees. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be filed at KWBA's office and shall be accessible by CDWEG and USFWS.</p> <p>vii. Standards for Construction of Canals – Concrete-lined canals will have a side slope of 1.5 to 1 or less and the sides will have a concrete finish which will assist in the escape of animals. If canals are determined by CDFWG or USFWS to be substantial impediments to kit fox movement, plank or pipe crossings will be provided across concrete canals in areas identified as having high kit fox</p>		

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			activity. c) On-Going Practices i. Equipment Storage - All equipment storage and parking during site development and operation shall be confined to the construction site or to previously disturbed off site areas that are not habitat for listed species. ii. Traffic Control - KWBA's project representative shall establish and issue traffic restraints and signs to minimize temporary disturbances. All construction related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas. Project related vehicles shall observe a 25 MPH speed limit in all project areas except on county roads and state and federal highways. iii. Food Control - All food-related trash items such as wrappers, cans, bottles, and food scraps generated both during construction and during subsequent facility operation shall be disposed of in closed containers and shall be regularly removed from the site. Food items may attract kit foxes onto a project site, consequently exposing such animals to increased risk of injury or mortality. iv. Dog Control - To prevent harassment or mortality of kit foxes or destruction of kit fox dens or predation on this species; no domestic dogs or cats, other than hunting dogs, shall be permitted on-site.		

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			<p>v. Pesticide Use - Use of rodenticides and herbicides on the site shall be permitted in accordance with the Vegetation Management Plan, which incorporates by reference the Interim Measures for Use of Rodenticides in Kern County, and which will incorporate by reference any other applicable laws, rules, and regulations regarding the use of pesticides as they take effect.</p> <p>d) Project Representatives KWBA shall designate a specific individual as a contact representative between KWBA, USFWS, and CDFWG to oversee compliance with protection measures-detailed herein. KWBA shall provide written notification of the contact representative to CDFWG and USFWS within 30 days of issuance of the Permits and the Management Authorizations. Written notification shall also be provided by KWBA to CDFWG and USFWS in the event that the designee is changed.</p> <p>e) Notification Regarding Dead, Injured or Entrapped Listed Animals Any employee or agent of KWBA who kills or injures a San Joaquin kit fox, blunt nosed leopard lizard, Tipton kangaroo rat, San Joaquin antelope squirrel, or other listed species listed as a threatened or endangered animal under FESA or CESA, or who finds any such animal either dead, injured, or entrapped on the Kern Water Bank shall report the incident immediately to KWBA's representative who shall, in turn, report the incident or finding to USFWS and CDFWG. In the event</p>		

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			<p>that such observations are of entrapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape unimpeded. In the event that such, observations are of injured or dead animals, KWBA shall immediately notify USFWS and CDFWG by telephone or other expedient means. KWBA shall then provide formal notification to USFWS and CDFWG, in writing, within three working days of the finding of any such animal(s). Written notification shall include the date, time, location, and circumstances of the incident.</p> <p>The USFWS contact for this information shall be the Assistant Field Supervisor for Endangered Species, Sacramento Field Office. The CDFWG contact shall be the Environmental Services Supervisor at the San Joaquin Valley-Southern Sierra Region Headquarters.</p> <p>USFWS or CDFWG will be notified if any other animal, which is otherwise a listed species, is found dead or injured.</p> <p>f) Construction of Supply/Recovery Canal</p> <p>Within 60 days prior to the construction of the supply/recovery canal within the zone marked within the Map of the Kern Water Bank, KWBA shall conduct a limited survey within the area of the Kern Water Bank, which <u>will be</u> affected by that construction, with the sole goal of identifying potential San Joaquin kit fox dens. KWBA shall contact USFWS and CDFWG pursuant to the salvage procedures set forth above if any kit fox</p>		

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			<p>dens are found.</p> <p>g) Take Avoidance Protocol for Fully Protected Species <u>Although a population of blunt nosed leopard lizards was relocated to the Kern Water Bank, there is no known present occurrence of them.</u> Existing data on the blunt nosed leopard lizard at the Kern Water Bank indicates that populations, <u>if they exist</u>, occur within habitat set asides (either sensitive, compatible, or conservation bank habitat), thus the likelihood of take from project construction, operation, and maintenance is negligible. However, in the future adaptive management measures may expand to areas of suitable habitat.</p> <p>Three other species, which may be found on the Kern Water Bank, are also state designated fully protected species: American peregrine falcon, Greater sandhill crane, and White-tailed kite. The likelihood of the take of any of these species from project construction, operation, and maintenance is negligible due to their mobility and preferred habitats. However, to avoid any take of these species, the same take avoidance protocol as set out for the blunt nosed leopard lizard shall apply to each of these three species.</p> <p>KWBA will comply with the terms of the NCCP Approval and Take Authorization as it relates to <u>Until such time that the KWBA obtains appropriate authorization for take of the state-designated fully protected species (Appendix 7-e) blunt nosed leopard lizard by the Fish and Game Commission,</u> †The following take avoidance protocol shall apply in any areas that contain suitable</p>		

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			<p>habitat for fully protected species not covered by authorization for take of state-designated fully protected species identified in this subsection (g) of the blunt nosed leopard lizard:</p> <ul style="list-style-type: none"> i. A qualified biologist shall survey any areas proposed for project related disturbance that contain suitable habitat for <u>fully protected species</u> the blunt nosed leopard lizard to determine the likelihood of presence. Suitable habitat consists of valley and foothill grasslands, saltbrush scrubland, iodine bush grassland, and alkali flats. ii. If these <u>fully protected species</u> blunt nosed leopard lizards are found to occur in areas proposed for project facilities construction or maintenance, construction of avoidance should take place. first. If avoidance is not practicable, then the blunt nosed leopard lizard will be trapped and relocated prior to disturbance of KWBA's expense in accordance with the applicable annual management plan. This work must be done by or under the direction of the USFWS staff be persons with appropriate experience and with their own take for scientific purposes permits. This procedure will avoid any violation of state law. <p>The use of a biological monitor, and special construction activities and on- going practices will result in a heightened awareness and education regarding sensitive biological resources, which will reduce the potential for impacts on special-status</p>		

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			species. In addition, the use of a project representative as a liaison between the KWBA and the resource agencies will expedite notification regarding any take of a listed animal. While take of a fully protected species is not anticipated, this mitigation outlines avoidance protocol to further reduce the likelihood of said take. Together these mitigation measures and the beneficial net increase of habitat for special- status species through implementation of the HCP/NCCP will reduce any potential impact to a less-than-significant level.		
7.5 Visual Resources					
7.5-3 Implementation of KWB activities could potentially affect visual resources.	LTS	LTS	7.5-3 None required.	NA	NA
7.6 Agricultural Resources					
7.6-1 KWB activities could potentially convert agricultural uses, including Important Farmland, to nonagricultural uses or potentially convert irrigated farmland to orchards, which could cause other indirect effects.	LTS	LTS	7.6-1 None required.	NA	NA
7.7 Air Quality					
7.7-1 Construction of KWB facilities could potentially generate emissions that would	LTS	LTS	7.7-1 None required.	NA	NA

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violate air quality standards or conflict with or obstruct implementation of the SJVAPCD air quality plan.					
7.7-2 Operations and maintenance of existing and proposed KWB facilities could potentially generate air pollutant emissions that would violate air quality standards or conflict with or obstruct implementation of the SJVAPCD air quality plan.	LTS	LTS	7.7-2 None required.	NA	NA
7.7-3 Construction, operations, and maintenance of existing and proposed KWB facilities could potentially generate cumulatively considerable air pollutant emissions.	LTS	LTS	7.7-3 None required.	NA	NA
7.7-4 Construction, operations, and maintenance of existing and proposed KWB facilities could potentially expose sensitive receptors to substantial pollutant concentrations.	LTS	LTS	7.7-4 None required.	NA	NA
7.7-5 Construction, operations, and maintenance of the existing and proposed KWB facilities could potentially generate objectionable odors affecting a substantial number of people.	LTS	LTS	7.7-5 None required.	NA	NA

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7.8 Geology, Soils, and Mineral Resources					
7.8-1 Rates of erosion could potentially be affected by KWB activities.	LTS	PS	7.8-1 KWBA will implement the following measures: a) Comply with NPDES permit requirements, which include preparation of a site-specific SWPPP and implementation of BMPs specifically designed to control erosion and reduce the transport of sediment and other pollutants (see Section 7.0.4.1.1). b) Comply with measures in the KWB HCP/NCCP Vegetation Management Plan, including the following specified for sediment removal and erosion control (see Appendix 7-7c): i. Sediment build up in canals and recharge basins must be removed to maintain adequate flow and water capacity in canals and to maintain good percolation in recharge basin. Sediment is typically removed mechanically with an excavator. To minimize transport costs of disposal, the loose soil sediments are typically placed on or near levees and canals. When feasible, islands in the recharge basis will be constructed from the spoil of the removal process. If this practice is to continue, then newly placed soils will be compacted onto the levee side slopes and tops where appropriate in areas that are not known to support kit fox dens, Tipton kangaroo rat	NA	LTS

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			burrows, blunt-nosed leopard lizards or burrowing owl holes. Hay mulch may be applied to the bare slopes and seed would occur at the proper time of year as appropriate. The elimination of bare soil conditions will decrease erosion. In addition, establishing marsh vegetation at the head of stream flow patterns will filter water and reduce sediment transport through the system. ii. Water conveyance structures and control devices require periodic erosion control protection measures. Concrete riprap is typically used near the structures to prevent excessive erosion. Sidebank blowouts near conveyance structures shall be refilled and revegetated where appropriate. c) Use a watering truck to minimize fugitive dust generated during grading when conditions require, such as on dry, windy days (1997 Monterey IS and Addendum, Measure E-1)(see Appendix 7-6a).		
7.8-2 KWB activities could potentially expose people and structures to risks from unstable soils (liquefaction).	LTS	LTS	7.8-2 None required.	NA	NA

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7.8-3 KWB activities could potentially cause or contribute to subsidence as a result of groundwater extraction.	LTS	LTS	7.8-3 None required.	NA	NA
7.9 Recreation					
7.9-3 KWB activities could potentially affect recreational resources within KWB Lands.	LTS	LTS	7.9-3 None required.	NA	NA
7.10 Land Use and Planning					
7.10-1 Implementation of KWB activities could potentially change land use designations, thereby physically dividing an established community in the southern San Joaquin Valley portion of Kern County.	LTS	LTS	7.10-1 None required.	NA	NA
7.10-2 KWB activities could potentially conflict with adopted general plan policies, land use designations, and zoning codes.	LTS	LTS	7.10-2 None required.	NA	NA
7.11 Hazards and Hazardous Materials					
7.11-1 KWB construction activities could potentially expose workers or the public to previously unidentified hazards or hazardous materials.	LTS	PS	7.11-1 KWBA will implement the following measures: a) Require construction contracts to include specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels and Title 8 of the CCR which	NA	LTS

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			<p>addresses the use of hazardous products in the work environment, which would apply to construction contractors. (See Section 7.0.4.1.2.)</p> <p>b) Ensure that the use of herbicides on the site shall be permitted in accordance with the KWB HCP/NCCP Vegetation Management Plan, which will incorporate by reference any other applicable laws, rules, and regulations regarding the use of pesticides as they take effect. (Measure B-3(e), Ongoing Pesticide Use, in 1997 Monterey IS and Addendum)(see Appendix 7-6a and Section 7.0.4.1.5).</p> <p>c) Provide a comprehensive Worker Environmental Awareness Program (WEAP) that will include all training requirements identified in Best Management Practices, Worker Site Specific Health and Safety Plan, and mitigation measures, including training for all field personnel (e.g., KWBA employees, agents, and contractors). The WEAP shall include protocols and training for responding to and handling of hazardous materials and hazardous waste management, and emergency preparedness, release reporting, and response requirements. KWBA will ensure that all construction workers at risk of inhaling dust shall be provided masks with filters designed to trap spores of the size of Valley Fever fungus. (See Appendix 7.6b, 2016 KWBA Resolution).</p> <p>d) Comply with Mitigation Measure 7.8-1 and 7.8-2.</p>		

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7.11-2 KWB activities could create a hazard to the public or environment through accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials.	LTS	PS	7.11-2 KWBA will implement Mitigation Measure 7.11-1.	NA	LTS
7.11-3 KWB activities could potentially be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a potential hazard for the environment and people residing or working in the immediate area.	LTS	LTS	7.11-3 None required.	NA	NA
7.11-4 KWBA activities with regard to accidents and upsets from onsite and adjacent third-party activities on or near KWB Lands could potentially create a significant hazard to the public or environment.	LTS	PS	7.11-4 KWBA will implement the following measures: a) Implement Mitigation Measure 7.11-1. b) Continue to monitor the remediation of the current and any future hydrocarbon contamination from third-party oil and gas activities. (Measure C-2, Hydrocarbon Contamination Monitoring, in 1997 Monterey IS and Addendum)(See Appendix 7-6a.) c) KWBA shall implement the following measures before and during ground-disturbing activities to reduce health hazards associated with potential exposure to hazardous substances (2016 KWBA Resolution)(see Appendix 7-6b.) i. If stained or odorous soil is discovered during project-related construction activities, KWBA shall	NA	LTS

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			<p>retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment and/or other appropriate testing. Recommendations in the Phase II Environmental Site Assessment to address any contamination that is found shall be implemented before continuing with ground-disturbing activities in these areas.</p> <p>ii. As required by law, notify the appropriate federal, state, and local agencies if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) or if unknown or previously undiscovered underground storage tanks are encountered during construction activities.</p>		
7.11-5 KWB activities could potentially 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.	LTS	LTS	7.11-5 None required.	NA	NA
7.11-6 KWB activities could increase airborne vector populations or the likelihood of waterborne disease or illness.	LTS	PS	<p>7.11-6: KWBA will implement the following:</p> <p>a) Implement Mitigation Measure 7.11-1(c).</p> <p>b) Implement Measure P-1, Implementation of Mosquito Abatement Plan, in the 1997 Monterey IS and Addendum (see Appendix 7-6a) with modifications for measures that proved infeasible or unsuccessful. In accordance with the Mosquito</p>	NA	LTS

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			Abatement Plan, KWBA will engage in the following procedures which are expected to reduce any impact due to the breeding of mosquitoes in the recharge basins to insignificance: <ul style="list-style-type: none"> i. KWBA will notify staff of the Kern and Westside Mosquito Abatement Districts (District) of planned use of recharge basins. ii. Roads on the KWB will be kept in a reasonable condition to allow the District access to the KWB. iii. KWBA will assist District staff in adaptive management planning to review the success of mosquito control techniques and to develop improved mosquito control techniques. 			
7.12 Noise						
7.12-3	Noise levels in the <u>KWB Lands Kern Fan Element</u> could be potentially affected by development of groundwater storage facilities.	LTS	LTS	7.12-3 None required.	NA	NA

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7.13 Cultural and Paleontological Resources					
7.13-1 KWB activities could potentially result in damage and/or destruction of cultural and paleontological resources.	LTS	PS	7.13-1a KWBA will implement the following measures to minimize potential adverse impacts on cultural resources (see Appendix 7-6b, 2016 KWBA Resolution): a) Prior to ground disturbance for new pond or well construction and associated facilities, an analysis to identify the potential presence of archaeological resources on the project site shall be conducted. The analysis shall include, at a minimum, a records check and literature survey from the appropriate California Historical Resources Information System (CHRIS) center and a Phase I Cultural Resources Investigation by an archaeologist meeting the Secretary of the Interior's Standards. If resources are known to exist on a project site, the analysis shall include an assessment of the resource and shall include measures for the in-situ protection, or the recovery, preservation, study, and curation of the resource, as appropriate. The analysis and the measures developed shall be consistent with the practices and intent described in Section 21083.2 et seq. of the Public Resources Code, as well as Sections 15064.5 et seq. and 15126.4(b) of the California Code of Regulations, and shall be consistent with current professional archaeological standards. The archaeologist shall prepare a report of the results of any study prepared, following accepted professional practice. Copies of the report	NA	LTS

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			<p>shall be submitted to the KWBA and to the appropriate CHRIS information center. KWBA shall also consult, as appropriate, with the Native American Heritage Commission and appropriate Native American tribal representatives to address Native American cultural values with respect to archaeological contexts and places of traditional use or importance.</p> <p>b) As a condition of all contracts for new pond or well construction and associated facilities and prior to ground-disturbing activities, all earth-moving and excavation contractor employees shall attend an orientation session informing them of the potential for inadvertently discovered cultural resources and/or human remains and protection measures to be followed to prevent destruction of any and all cultural resources discovered on site. The applicant's designated project construction manager, a qualified archaeologist, and a qualified cultural resource manager/monitor from a local California Native American tribe shall conduct the orientation (unless the local tribe opts not to participate). The orientation will include information regarding the potential for objects to occur on site, a summary of applicable environmental law, procedures to follow if potential cultural resources are found, and the measures to be taken if cultural resources and/or human remains are unearthed as part of the project.</p>		

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			<p>c) Construction areas for new ponds and wells and associated facilities shall be staked prior to earthmoving by a qualified archaeologist in consultation with the contractor to indicate the construction area, construction staging area, and buffer. No earthmoving, parking, or materials storage will be allowed outside the staked areas. Prior to construction, the archaeologist shall survey the area to identify any surface artifacts within the staked area. An archaeologist and qualified cultural resource manager/monitor from a local California Native American tribe (unless the local tribe opts not to participate) shall be present during any grubbing or topsoil grading within the staked area. If previously unknown buried cultural resources, such as flaked or ground stone, historic debris, building foundations, or nonhuman bone (unless determined to be from present day grazing operations), are discovered during ground-disturbing activities, work will stop in that area and within an appropriate buffer area, as determined by the archaeologist. The archaeologist shall assess the significance of the affected cultural resources and, if necessary, develop feasible and appropriate treatment measures in consultation with the project staff, such as avoidance, capping with geotextile and fill, or Phase III data recovery consistent with applicable standards adopted pursuant to the National Historic Preservation Act.</p>		

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			<p>d) In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately, the area of the find shall be protected, and KWBA immediately shall notify the County Coroner of the find and comply with the provisions of PRC Section 5097 with respect to Native American involvement, burial treatment, and re-burial, if necessary.</p> <p>7.13-1b. KWBA will implement the following measures to minimize potential adverse impacts on previously unknown potentially unique, scientifically important paleontological resources: (see Appendix 7-6b, 2016 KWBA Resolution):</p> <p>a) Before the start of any well-drilling activities, KWBA shall retain a qualified paleontologist or other qualified individual to train all personnel involved with earthmoving and/or well drilling activities regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered (this training can take place at the same time as the orientation required by 7.13-1a).</p> <p>b) In the event that paleontological resources are discovered, KWBA will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential</p>		

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			resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. If fossil or fossil bearing deposits are discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist will notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If KWBA determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to KWBA for review and approval prior to implementation. The analysis and measures developed shall be consistent with the Conformable Impact Mitigation Guidelines developed by the Society of Vertebrate Paleontology and current professional paleontological standards.			
7.14 Public Services and Utilities						
7.14-1	KWB activities could potentially result in the need for new or expanded governmental facilities or an increase in demand for public services and utilities.	LTS	LTS	7.14-1 None required.	NA	NA

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MONTEREY PLUS REIR: SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
7.15 Traffic and Transportation					
7.15-3 Traffic and circulation <u>on or near KWB Lands in the Kern Fan Element</u> could potentially be affected by <u>KWB activities, construction and operation of percolation ponds</u>	LTS	LTS	7.15-3 None required.	NA	NA
7.16 Energy					
7.16-1 KWB activities would potentially require or result in the construction of new electrical or natural gas facilities.	LTS	LTS	7.16-1 None required.	NA	NA
7.16-2 KWB activities could potentially develop land uses and patterns that cause substantial wasteful, inefficient, and unnecessary consumption of energy that would result in an increased demand for energy.	LTS	PS	7.16-2 KWBA will implement Mitigation Measure 12-1.	NA	LTS
Chapter 12 Climate Change					
12-1 KWB construction and operations/maintenance would generate GHG emissions that could potentially make a considerable contribution to a significant cumulative effect on climate change.	LTS	PS	12-1 KWBA will implement the following measures (2016 KWBA Resolution, Appendix 7.6b): a) Pump Efficiency Monitoring: KWBA will conduct pump efficiency monitoring to ensure that all KWB pumps are monitored and evaluated at regular intervals during recovery periods. i. Daily Pump Efficiency Monitoring: Pumps shall	NA	LTS

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	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>be monitored daily for their total water volume pumped (acre-feet [AF]) and electricity consumption (kilowatt-hours [kWh]), which will be used to calculate a daily energy efficiency value (i.e., kWh/AF).</p> <p>ii. Pump Efficiency Software: Metro or an equivalent water system management program will be used to provide up-to-date and streamlined methods to analyze KWB's individual pump and total system efficiency.</p> <p>b) Pump Rehabilitation, Retrofits, and Replacement: KWBA shall use data from the Pump Efficiency Monitoring component to strategically and actively rehabilitate, retrofit, and/or replace pumps as needed during recovery periods.</p> <p>i. Pump Prioritization and Testing: Pump rehabilitation, retrofit, and replacement shall be prioritized by accounting for the relative efficiency of each pump with respect to the total pump system and water volume pumped through each pump. Data obtained from the Pump Efficiency Monitoring component shall be used to prioritize which pumps will be rehabilitated, retrofitted, and/or replaced. In addition efficiency testing by external entities if available (e.g., pump company, Pacific Gas & Electric Company [PG&E]) or other similar analysis will also be used for the prioritization process.</p>		

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	1996-2014	2015-2030*		1996-2014	2015-2030*
			<ul style="list-style-type: none"> ii. Schedule: KWBA shall rehabilitate, retrofit, and/or replace pumps/wells at the earliest possible time without substantially disturbing ongoing O&M activities, but at a minimum will rehabilitate, retrofit, and/or replace at least an annual average of 5 pumps per year during a prolonged recovery period such as occurred between 2013 and 2016. c) Reporting: KWBA will maintain a quarterly and annual reporting program that will be publicly available online. Annual reports will cover calendar years and be posted online by March 30 to cover the previous year. Quarterly reports will be posted online within 30 days of the end of each calendar quarter. The annual and quarterly reports will include, but are not limited to, the following components: <ul style="list-style-type: none"> i. KWB O&M Totals: Total quarterly electricity consumption for recovery pumping activities along with total acre-feet recovered shall be provided online. A running total of the annual electricity consumption and acre-feet recovered by quarter shall also be provided. ii. Pump Efficiency: A summary of the pump efficiency (kWh/acre-feet) for each of KWB's pumps will be provided quarterly. Similar to the KWB O&M Totals, a running annual average efficiency for each pump shall be provided. These data shall be used to identify 		

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
			<p>the 5 pumps per year that will be rehabilitated, retrofitted, or replaced. If a pump/well is adjusted for depth, notes shall be made within the reports to explain these changes in pump efficiency.</p> <p>iii. Electricity Efficiency Actions: Each report should include actions taken in the previous quarter to rehabilitate, retrofit, and/or replace pumps. Any other energy efficiency measures taken will be reported. When information is available from PG&E's Advanced Pumping Efficiency Program or other similar programs, annual electricity savings from these actions shall be included in the quarterly and annual reports to clearly show the electricity savings associated with rehabilitation, retrofit, and/or replacement actions. If annual energy savings cannot be determined through pre- and post-pump improvement testing, KWBA shall report the empirical annual energy savings (kWh/year) from these improvements in its annual reports.</p> <p>iv. Identifying Next Steps: Each annual report will include the list of 5 or more pumps planned to be evaluated for potential rehabilitation, retrofit, or replacement during that year. If all five of the least efficient pumps are not scheduled for rehabilitation, retrofit, and/or replacement in the coming year, the annual report shall</p>		

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	1996-2014	2015-2030*		1996-2014	2015-2030*
			explain what KWB operation requires the pump to remain in service that year. d) Pump Compliance: KWBA will only purchase new pumps that comply with United States Department of Energy pump efficiency regulations (10 CFR Part 429 and 431) when those regulations become effective in the marketplace in 2020. e) Future Increases in Technology and Emissions Standards: KWBA shall actively consider replacing older pumps with new pumps with increased efficiency technology. All future requirements for pumps at the federal, state, and/or local level shall be complied with.		
12-2 Construction and operations/maintenance of the existing and proposed KWB activities could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions.	NA	LTS	12-2 None required.	NA	NA
CUMULATIVE IMPACTS OF THE MONTEREY PLUS REVISED EIR					
Surface Water and Groundwater Hydrology					
10.1-23 Implementation of KWB activities in combination with regional and local water banking projects could potentially deplete groundwater supplies so that a net deficit in aquifer volume of stored groundwater would occur.	NA	LTS	10.1-23 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-24 Implementation of KWB activities in combination with regional and local water banking projects could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).	NA	PS	10.1-24 KWBA will implement Mitigation Measure 7.1-2.	NA	LTS
10.1-25 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts related to the alteration of water levels in a groundwater basin that substantially affect existing infrastructure (e.g., conveyance facilities).	NA	PS	10.1-25 KWBA will implement Mitigation Measure 7.1-7.	NA	LTS
10.1-26 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts related to the alteration of water levels in a groundwater basin that substantially affect existing infrastructure (e.g., residential septic systems).	NA	LTS	10.1-26 None required.	NA	NA

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Impact	Level of Significance Prior to Mitigation		Mitigation Measure(s)	Level of Significance After Mitigation	
	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-27 Raise water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge.	NA	LTS	10.1-27 None required.	NA	NA
Surface Water and Groundwater Quality					
10.1-28 Implementation of KWB activities in combination with regional and local water banking projects could potentially change groundwater quality from construction and maintenance activities.	NA	PS	10.1-28 KWBA will implement Mitigation Measure 7.2-1.	NA	LTS
10.1-29 Implementation of KWB activities in combination with regional and local water banking projects could potentially degrade groundwater quality from mobilization of contamination associated with hazardous waste sites or oil and gas production operations.	NA	PS	10.1-29 KWBA will implement Mitigation Measures 7.2-2.	NA	LTS
10.1-30 Implementation of KWB activities in combination with regional and local water banking projects could potentially have their water quality degraded from the operation of oil and gas production wells on KWB Lands and nearby.	NA	PS	10.1-30 KWBA will implement Mitigation Measure 7.2-3.	NA	LTS
10.1-31 KWB construction and maintenance activities could potentially change groundwater quality.	NA	LTS	10.1-31 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-32 KWB operations could mobilize contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations and potentially degrade groundwater quality.	NA	LTS	10.1-32 None required.	NA	NA
10.1-33 The operation of oil and gas production wells within and surrounding KWB Lands could potentially degrade the quality of KWB water supplies.	NA	LTS	10.1-33 None required.	NA	NA
10.1-34 Implementation of KWB activities in combination with regional and local water banking projects could result in changes in water quality in the underlying aquifer as a result of lateral and vertical migration of poor water quality within and outside the limits of the KWB.	NA	LTS	10.1-34 None required.	NA	NA
10.1-35 Implementation of KWB activities in combination with regional and local water banking projects could result changes in water quality in the underlying aquifer as a result of an accumulation of salts during recharge activities.	NA	LTS	10.1-35 None required.	NA	NA
10.1-36 Implementation of KWB activities in combination with regional and local water banking projects could result in a	NA	LTS	10.1-36 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
cumulatively considerable impact on water quality in the Kern River.					
10.1-37 Implementation of KWB activities in combination with regional and local water banking projects could result adverse impacts associated with water quality in surface water conveyance facilities and associated water supplies for downstream users.	NA	LTS	10.1-37 None required.	NA	NA
Fisheries Resources					
10.1-38 Implementation of KWB activities in combination with regional and local water banking projects in Kern County could potentially result in cumulatively considerable impacts on fish species of special concern through entrainment.	NA	LTS	10.1-38 None required.	NA	NA
Terrestrial Biological Resources					
10.1-39 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts on special-status terrestrial biological resources.	NA	PS	10.1-39 KWBA will implement Mitigation Measure 7.4-3.	NA	LTS

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-40 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on special-status terrestrial biological resources as a result of potential changes in agricultural practices.	NA	LTS	10.1-40 None required.	NA	NA
Visual Resources					
10.1-41 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on visual resources.	NA	LTS	10.1-41 None required.	NA	NA
10.1-42 Implementation of KWB activities in combination with regional and local water banking and other water supply projects could potentially result in cumulatively considerable impacts on visual resources as a result of potential changes in agricultural practices.	NA	LTS	10.1-42 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
Agricultural Resources					
10.1-43 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in the conversion of agricultural lands, including Important Farmland, to nonagricultural uses.	NA	LTS	10.1-43 None required.	NA	NA
10.1-44 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in the conversion of annual crops to permanent crops.	NA	LTS	10.1-44 None required.	NA	NA
Air Quality					
10.1-45 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially generate cumulatively considerable air pollutant emissions that would violate air quality standards.	NA	LTS	10.1-45 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-46 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable exposure of sensitive receptors to substantial pollutant concentrations.	NA	LTS	10.1-46 None required.	NA	NA
10.1-47 Construction, operations, and maintenance of the existing and proposed KWB facilities with other cumulative projects could potentially generate objectionable odors in a cumulative manner affecting a substantial number of people.	NA	LTS	10.1-47 None required.	NA	NA
10.1-48 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable air pollutant emissions as a result of potential changes in agricultural practices.	NA	LTS	10.1-48 None required.	NA	NA
Geology, Soils, and Mineral Resources					
10.1-49 Implementation of KWB activities in combination with regional and local water banking projects could expose people and structures to risks from unstable soils (liquefaction).	NA	LTS	10.1-49 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-50 Implementation of KWB activities in combination with regional and local water banking projects could cause or contribute to subsidence as a result of groundwater extraction.	NA	LTS	10.1-50 None required.	NA	NA
10.1-51 Implementation of KWB activities in combination with regional and local water banking projects could contribute to movement on regional faults.	NA	LTS	10.1-51 None required.	NA	NA
10.1-52 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase soil erosion	NA	LTS	10.1-52 None required.	NA	NA
10.1-53 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase soil erosion as a result of potential changes in agricultural practices.	NA	LTS	10.1-53 None required.	NA	NA
Recreation					
10.1-54 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts on waterfowl and related recreational resources.	NA	NI	10.1-54 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
Land Use and Planning					
10.1-55 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially conflict with adopted general plan policies, land use designations, and zoning codes.	NA	NI	10.1-55 None required.	NA	NA
10.1-56 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on land use patterns as a result of potential changes in agricultural practices.	NA	LTS	10.1-56 None required.	NA	NA
Hazards and Hazardous Materials					
10.1-57 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts related to the creation of a hazard to the public or environment through routine transport, use, or disposal of hazardous materials.	NA	LTS	10.1-57 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-58 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in airborne vector populations or in the likelihood of waterborne disease or illness.	NA	PS	10.1-58 KWBA will implement Mitigation Measure 7.11-6.	NA	LTS
Noise					
10.1-59 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in noise levels near sensitive receptors.	NA	LTS	10.1-59 None required.	NA	NA
10.1-60 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase noise levels as a result of potential changes in agricultural practices.	NA	LTS	10.1-60 None required.	NA	NA
Cultural and Paleontological Resources					
10.1-61 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts related to the damage to and/or destruction of cultural and paleontological resources.	NA	PS	10.1-61 KWBA will implement Mitigation Measures 7.13-1(a) and 7.13-1(b).	NA	LTS

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	1996-2014	2015-2030*		1996-2014	2015-2030*
10.1-62 Implementation of KWB activities in combination with regional and local water banking projects potentially result in cumulatively considerable impacts related to damage to or destruction of cultural and paleontological resources as a result of potential changes in agricultural practices.	NA	LTS	10.1-62 None required.	NA	NA
Public Services and Utilities					
10.1-63 Implementation of KWB activities in combination with regional and local water banking and local development projects on or near KWB Lands could potentially result in cumulatively considerable impacts related to the need for new or expanded governmental facilities or an increase in demand for public services and utilities.	NA	LTS	10.1-63 None required.	NA	NA
Traffic and Transportation					
10.1-64 Implementation of KWB activities in combination with regional and local water banking and local development projects on or near KWB Lands could potentially result in cumulatively considerable increases in traffic.	NA	LTS	10.1-64 None required.	NA	NA

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10.1-65 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in traffic as a result of potential changes in agricultural practices.	NA	LTS	10.1-65 None required.	NA	NA
Energy					
10.1-66 Implementation of KWB activities in combination with regional and local water banking, development, and capital improvement projects could develop land uses and patterns that cause cumulatively considerable impacts associated with the wasteful, inefficient, and unnecessary consumption of energy.	NA	PS	10.1-66 KWBA will implement Mitigation Measure 12-1.	NA	LTS
10.1-67 Implementation of KWB activities in combination with regional and local water banking and local development projects could potentially require or result in the construction of new electrical or natural gas facilities.	NA	LTS	10.1-67 None required.	NA	NA

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	1996-2014	2015-2030*		1996-2014	2015-2030*
Climate Change					
10.1-68 Implementation of KWB activities in combination with regional and local water banking projects could potentially generate cumulatively considerable GHG emissions.	NA	PS	10.1-68 KWBA will implement Mitigation Measure 12-1.	NA	LTS
Growth-Inducing Impacts					
10.1-69 KWB participant water supplies provided for urban development, in combination with regional and local water banking projects, could potentially generate cumulatively considerable contributions to significant cumulative impacts from urban development.	NA	PSU	10.1-69 No feasible mitigation available.	NA	SU
Notes: *2015-2035 for Sections 7.1 and 7.2 impacts, which were developed partially or totally based on modeling which used a 2015-2035 modeling period.					

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**1. INTRODUCTION
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

**2. STATE WATER PROJECT
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

**3. HISTORY AND BACKGROUND
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

4. PROPOSED PROJECT (REVISED)

4. PROPOSED PROJECT (REVISED)

4.1 PROPOSED PROJECT UNDER REVIEW

As noted in the Monterey Plus DEIR, the proposed project is the Monterey Amendment and the Settlement Agreement. The overall objective, also as noted in the DEIR, was to resolve the underlying issues that led to the Monterey Amendment and to implement the Settlement Agreement. Six specific objectives for the Monterey Amendment were identified. These six objectives corresponded with five elements that would modify the long-term State Water Project (SWP) water supply contracts. One of those elements to the proposed project was the “transfer of property known as the ‘Kern Fan Element property’ in Kern County.” Text from DEIR Section 4.4 is copied below to show the revision of the proposed project description of the Monterey Amendment. All other text in DEIR Chapter 4 remains unchanged, including the description of the Settlement Agreement. KWB activities are described in Sections V-VI of the Revised Appendix E in this Revised EIR (REIR).

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;
- Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;
- Transfer of property known as the “Kern Fan Element property” in Kern County;
- Water supply management practices; and
- Restructured water rates.

This REIR has changed the description of the Kern Fan Element property transfer to be:

- Transfer of property known as the "Kern Fan Element property" in Kern County and its *development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or to the Settlement Agreement, and no changes have been made relating to them in this REIR.

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5. METHODS
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)

**6. EFFECTS OF PROPOSED PROJECT ON SWP AND
SWP CONTRACTOR OPERATIONS
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

7.0 INTRODUCTION TO THE ANALYSIS (NEW)

7.0 INTRODUCTION TO THE ANALYSIS (NEW)

7.0.1 SCOPE OF THE EIR ANALYSIS

The Environmental Analysis chapter of this REIR presents the environmental and regulatory setting, impacts, and mitigation measures for each of the following technical issue areas (Sections 7.1 through 7.16):

- 7.1 Surface Water and Groundwater Hydrology (New)
- 7.2 Surface Water and Groundwater Quality (New)
- 7.3 Fisheries Resources (New)
- 7.4 Terrestrial Biological Resources (Revised)
- 7.5 Visual Resources (New)
- 7.6 Agricultural Resources (New)
- 7.7 Air Quality (New)
- 7.8 Geology, Soils, and Mineral Resources (New)
- 7.9 Recreation (Revised)
- 7.10 Land Use and Planning (New)
- 7.11 Hazards and Hazardous Materials (New)
- 7.12 Noise (Revised)
- 7.13 Cultural and Paleontological Resources (New)
- 7.14 Public Services and Utilities (New)
- 7.15 Traffic and Transportation (Revised)
- 7.16 Energy (New)

Supporting Chapter 7 appendices in Document A1, Volume II (Appendices) are as follows:

- Appendix 7-1. KWB Study Area Physical Data Collection Technical Report
- Appendix 7-2. Kern Water Bank Groundwater Model Results Technical Report
- Appendix 7-2a Known Areas of Controversy
- Appendix 7-3. Surface and Groundwater Quality Technical Report
- Appendix 7-4. Air Quality Model Results
- Appendix 7-5a. Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program (1995 KWB MOU)
- Appendix 7-5b. Interim Project Recovery Operations Plan Regarding Kern Water Bank Authority (KWBA) and Rosedale-Rio Bravo Water Storage District (Rosedale) Projects (2014)(Interim Operations Plan or Interim Plan)

- Appendix 7-5c. Long-Term Project Recovery Operations Plan regarding Kern Water Bank Authority Project (2016 KWB Long-Term Operations Plan)
- Appendix 7-5d. Agreement between West Kern Water District and Kern Water Bank Authority for the Exchange and Recharge of Water (2013)
- Appendix 7-5e. Cross Valley Canal / Kern Water Bank Operating Guidelines during Shallow Groundwater Conditions (2000)
- Appendix 7-6a. Initial Study and Addendum to Monterey Agreement EIR of the Kern Water Bank Authority, Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (1997 Monterey IS and Addendum)
- Appendix 7-6b. 2016 Kern Water Bank Authority Resolution (2016 KWBA Resolution)
- Appendix 7-7a. Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP), Implementation Agreement, and Exhibit H to Implementation Agreement (1997)
- Appendix 7-7b. Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, Appendix A, Kern Water Bank Operations Manual (1997)
- Appendix 7-7c. Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, Appendix C, Kern Water Bank Vegetation Management Plan (1997)
- Appendix 7-7d. Kern Water Bank Habitat Conservation Plan/ Natural Community Conservation Plan, Appendix D, Kern Water Bank Waterbird Management Plan (1997)
- Appendix 7-7e. California Department of Fish and Game Approval of Natural Community Conservation Plan and Take Authorization (1997)(CDFG Take Authorization)

7.0.2 SECTION FORMAT

Each section contains: (1) a description of the KWB activities that have the potential to affect the technical issue area under discussion; (2) methods of analysis; (3) standards of significance used to evaluate the significance of impacts from KWB activities; (4) physical setting; (5) regulatory setting; and (6) impacts and mitigation measures. The physical and regulatory setting provides a point of reference for assessing the environmental impacts of the KWB activities. Setting information is presented for 1995 (the year prior to implementation of any part of the Monterey Amendment) and 2014 (the year the analysis for this REIR was started). Only changes in the 1995 physical and regulatory setting are described in the 2014 setting.

The setting discussion is followed by an impacts and mitigation discussion. The impact and mitigation portion of each section includes statements of potential impact, which are prefaced by a number in **bold-faced** type. An explanation of each potential impact and a discussion of the analysis and conclusion reached regarding the **level of significance** without mitigation follow each impact statement. For potentially significant or significant impacts, mitigation measures pertinent to each individual impact are presented following the impact. Each mitigation measure is numbered and preceded by a short discussion of how the proposed measure mitigates the identified impact and a statement declaring the **level of significance** after implementing the mitigation measure.

Chapter 7 contains both revised and new resource sections. Revised sections are KWB-related text copied in its entirety from the Monterey Plus DEIR (as modified by the FEIR) into the REIR, with changes to that text shown in underline or ~~strikeout~~ mode. New sections have been sufficiently updated that no text is shown in underline or ~~strikeout~~ mode.

7.0.3 TERMINOLOGY

This Draft REIR uses the following terminology to describe environmental effects of the KWB activities in Chapter 7:

- **Standards of Significance:** A set of criteria used by the lead agency to determine at what level or “threshold” an impact would be considered significant. Standards of Significance used in this REIR include those discussed in the California Environmental Quality Act (CEQA) Guidelines; criteria based on factual or scientific information; criteria based on regulatory standards of federal, State, and local agencies; and criteria adopted by the California Department of Water Resources. In determining the level of significance, the analysis assumes that KWB activities would be conducted in compliance with relevant federal, State, and local regulations and ordinances.
- **Less-than-Significant Impact:** A project impact is considered to be less than significant when it does not reach the standard of significance and would therefore cause no substantial change in the environment (no mitigation required).
- **Potentially Significant Impact:** A potentially significant impact is an environmental effect that may result in a substantial adverse change in the environment; however, additional information is needed regarding the extent of the impact to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures are identified to reduce these effects to the environment to less-than-significant levels where feasible mitigation measures are available.
- **Significant Impact:** A project impact is considered significant if it would result in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects in the context of specified significance criteria. Mitigation measures are identified to reduce these effects to the environment to less-than-significant levels where feasible mitigation measures are available.
- **Significant and Unavoidable Impact:** A project impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level if the project is implemented. Findings of Overriding Considerations must be adopted to proceed with the project if significant impacts cannot be mitigated.
- **Cumulative Impacts:** According to 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, Section 15355). CEQA requires that cumulative impacts be discussed when the “project’s incremental effect is cumulatively considerable” (CEQA Guidelines, Section 15130 [a]).
- **Mitigation Measures:** The CEQA Guidelines (Section 15370) define mitigation as:
 - (a) Avoiding the impact altogether by not taking a certain action or parts of an action;
 - (b) Minimizing impacts by limiting the degree of magnitude of the action and its implementation;
 - (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
 - (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
 - (e) Compensating for the impact by replacing or providing substitute resources or environments.

To be consistent with the terminology of the Monterey Plus EIR, this REIR will use the following terms:

- “Kern Fan Element (KFE) property” when referring to the property before its transfer to the Kern County Water Agency/Kern Water Bank Authority (KCWA/KWBA) in 1995;
- “KWB Lands” when referring to the property after its transfer to KCWA/KWBA;
- “Kern Water Bank” or KWB when referring to the groundwater bank; and
- “KWB activities” when referring to the development and continued use and operation of the KFE property after it was acquired by KWBA.

7.0.4 TYPES OF MITIGATION MEASURES

This section describes the types of mitigation measures that are applied throughout Chapter 7.

7.0.4.1 Permits Required by Law/Regulation with Performance Standards

The following permits could apply to specific KWB activities. These permits are specific to each permitted activity and have clear, enforceable performance standards. The permit applicant (Kern Water Bank Authority [KWBA] in this case) is required to meet all permit requirements. The performance standards are clear and could reduce a potentially significant impact to a less-than-significant level.

7.0.4.1.1 National Pollutant Discharge Elimination System (NPDES) Permit

The federal Clean Water Act (CWA) requires that all municipal, industrial, and commercial facilities that discharge wastewater or stormwater directly from a point source (a discrete conveyance such as a pipe, ditch or channel) into a water of the United States (such as a lake, river, or ocean) must obtain a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES Program is a federal program which has been delegated to the State of California for implementation through the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The Central Valley RWQCB is responsible for issuing NPDES permits for the KWB. All permits are written to ensure the receiving waters will achieve their water quality standards. Based on this requirement, this REIR has used compliance with these requirements, in addition to other information, to conclude that some potentially significant impacts are less than significant. NPDES discharges can be permitted with an individual permit or covered under a general permit. Individual permits are written to address the specific design and applicable water quality standards to an individual facility while general permits authorize a category of discharges within a geographical area. Both individual and general permits contain requirements for controlling pollutant dischargers, monitoring discharges, and reporting compliance and either could apply to KWB activities. The majority of construction sites and industrial facilities which discharge stormwater are permitted under general NPDES permits.

NPDES permits have specific requirements that the permit holder must comply with. The NPDES Compliance and Enforcement Program of the CWA regulates point source discharges to the nation's waters. The U.S. Environmental Protection Agency (EPA) is responsible for assuring compliance with and enforcing environmental regulations and may delegate some of this responsibility to state and tribal governments.

In California, the SWRCB administers regulations promulgated by EPA (40 Code of Federal Regulations [CFR] Part 122) requiring the permitting of stormwater-generated pollution under the

NPDES. In turn, the SWRCB's jurisdiction is administered through the nine RWQCBs. Under these regulations, an operator must obtain a general permit through the NPDES Stormwater Program for all construction activities with ground disturbance of 1 acre or more. The general permit requires the implementation of Best Management Practices (BMPs) to reduce sedimentation into surface waters and to control erosion. One element of compliance with the NPDES permit is preparation of a Stormwater Pollution Prevention Plan (SWPPP) that addresses control of water pollution, including sediment, and the sources of runoff during construction.

Although the primary purpose of these regulations and standards is to protect surface water resources from the effects of land development (such as turbidity caused by sedimentation), measures included in such regulations and standards also reduce the potential for erosion and soil loss resulting from construction activities. Such regulations include, but are not limited to, the NPDES program for management of construction and municipal stormwater runoff, which is part of the federal CWA and is implemented at the State and local level through issuance of permits and preparation of site-specific pollution protection plans. Sections 1600 through 1607 of the California Fish and Game Code regulates activities that would alter stream characteristics, including sedimentation caused by erosion.

7.0.4.1.2 Hazardous Materials Management Laws and Regulations

Hazardous materials management laws and regulations are adopted at the State level in Titles 19 and 22 of the California Code of Regulations (CCR), which address proper storage and disposal of substances such as fuels. Title 8 of the CCR also addresses the use of hazardous products in the work environment, which would apply to construction contractors.

The California Environmental Protection Agency (Cal-EPA) and the State's Office of Emergency Services establish rules governing the use of hazardous materials. Within Cal-EPA, The Department of Toxic Substances Control (DTSC) has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law.

7.0.4.1.3 Air Quality Standards

Federal

EPA is the federal agency responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives.

As part of its enforcement responsibilities, EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs.

State

The California Air Resources Board (CARB), a part of Cal EPA, is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, the CARB conducts research, sets State ambient air quality standards, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. The CARB also has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts.

Local Air Quality Districts

Numerous local agencies throughout California have jurisdiction over local air quality control. These local agencies, called “air quality management districts” or “air pollution control districts,” are responsible for permitting many sources of air emissions and developing rules to regulate activities and operations that contribute to the degradation of air quality. Many districts also have produced guidance to help project applicants comply with CEQA.

KWB Lands are located within the western portion of Kern County, which is in the San Joaquin Valley Air Basin (SJVAB) and under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). SJVAPCD sets thresholds of significance for emissions from construction and operational activities for projects, such as KWB activities. In 2015, SJVAPCD updated the Guide for Assessing and Mitigating Air Quality Impacts (2015 GAMAQI) with thresholds of significance for construction and operational emissions occurring within its jurisdiction. These thresholds are clear, specific, quantitative, and enforceable thresholds that are the standard for significance determinations in CEQA documents for projects under SJVAPCD authority, such as KWB activities. Complaints that are filed regarding an offensive odor, observed smoke, dust, or other air pollution problem are dispatched to an inspector who can begin an investigation. SJVAPCD can issue a notice of violation (NOV) to inform an entity that a District rule, state law, or permit condition has been violated. The purpose of a NOV is to initiate corrective action that will stop the violation and to reduce air pollution. To provide an incentive for compliance, NOV's may result in monetary penalties up to \$1 million per day per violation; serious or repeated violations that show blatant disregard for the law and the public health may lead to criminal prosecution.

7.0.4.1.4 Burn Permits

The Kern County Fire Department is under contract to the State, and therefore is responsible for the local enforcement of state fire codes. In addition to State fire codes, Kern County also has ordinance codes that are also enforced throughout the county. The Kern County Fire Department allows open burning during certain seasons. Burning is not allowed in either the SJVAPCD or the Kern County Air Pollution Control District whenever a no-burn day has been declared. The Kern County Fire Department may suspend the open burning at any time it determines weather conditions become unsafe. Depending on rainfall, the open burning period typically lasts January through April. Open burning reduces fire hazards like flammable vegetation, but a burn permit is also required from the Kern County Fire Department. Cal Fire also regulates burns and may restrict burning in areas under its jurisdiction during certain times of the year. A burn restriction may limit the time of day when burning is allowed, or more commonly, will temporarily suspend all permitted burning until conditions become favorable. This REIR has used compliance with these requirements for conclusions that some potentially significant environmental impacts are less than significant. Burn permits are specific to each application and its terms and conditions must be followed.

7.0.4.1.5 Pesticide Regulations

Pesticide use is regulated by EPA and the California Department of Pesticide Regulation (CDPR). EPA sets broad restrictions on pesticide use; in general, California laws are more stringent than federal standards. Both federal and state laws require that pesticides be used according to their labels. Agricultural operations also require the applicator to file a detailed report on monthly pesticide use with the local county agricultural commissioner's office. CDPR maintains pesticide usage data reported to the county agricultural commissioner in its Pesticides Use Reporting Database. Pesticides used on KWB Lands are required to be used consistent in accordance with the KWB HCP/NCCP Vegetation Management Plan (Appendix 7-7c).

7.0.4.1.6 Kern County Environmental Health Services (KCEHS) Water Program for Wells

Water wells are regulated in Kern County by the KCEHS water program. The construction of new wells and well deepening, reconstruction, and destruction are subject to permits requiring compliance. General conditions are stipulated in KCEHS water well permit applications. Only legally licensed well drillers are permitted to drill new water wells to ensure that groundwater resources are not compromised by any new well or well modification.

7.0.4.1.7 Central Valley RWQCB and other Requirements Relating to Hazardous Materials Cleanup

The CVRWQCB issues cleanup and abatement orders (CAOs), as stipulated in §13304 of the Porter-Cologne Water Quality Control Act (as amended, 2016). KWBA would be subject to legal requirements regarding NPDES permits and hazardous materials cleanup, or pollution discharged into the waters of the State which creates, or threatens to create, a condition of pollution or nuisance in violation of any permitted discharge of waste.

7.0.4.1.8 DOGGR Requirements

All oil and gas activity on KWB Lands would be subject to the California Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR) regulations. DOGGR oversees the drilling, operation, maintenance, and plugging and abandonment of onshore and offshore oil, gas, and geothermal wells to protect life, health, property, and natural resources, including underground and surface waters suitable for irrigation or domestic use. Well abandonment procedures are done in accordance with DOGGR requirements. Pursuant to CCR, Title 14, Division 2, Chapter 4, Section 1722 (k), DOGGR establishes Field Rules which supplement more broadly applicable statutory and regulatory requirements regarding well operations to protect California's water resources and health and safety. These rules would apply to the operators of oil and gas rigs located on KWB Lands. Field Rules have been adopted for most zones and fields in Kern County.

7.0.4.2 Permits/Agreements with Unique Performance Standards

The following permits apply to KWB activities. These permits are specific to the permitted activity and have clear, enforceable performance standards. The permit applicant (KWBA in this case) is required to meet all permit requirements. The performance standards are clear and compliance with their terms could reduce any potentially significant impact to a less-than-significant level.

7.0.4.2.1 Kern Water Bank HCP/NCCP Incidental Take Permit

The U.S. Fish and Wildlife Service (USFWS) requires an incidental take permit when non-Federal activities will result in "take" of threatened or endangered species. A habitat conservation plan (HCP) must accompany an application for an incidental take permit. The purpose of the HCP process associated with the permit is to ensure there is adequate minimizing and mitigating of the effects of the authorized incidental take. The purpose of the incidental take permit is to authorize the incidental take of a listed species. The permit allows a landowner to legally proceed with an activity that would otherwise result in the illegal take of a listed species. The elements of an HCP are made binding through the incidental take permit. Violation of the terms of an incidental take permit would result in illegal take under Section 9 of the federal Endangered Species Act (ESA). USFWS must monitor the applicant's implementation of the HCP and the permit terms and conditions. In addition to compliance monitoring, the biological conditions associated with the HCP are monitored to determine if the species needs are being met. This includes determining if the biological goals that are expected as part of the HCP mitigation and minimization strategy are being met. The effectiveness monitoring helps USFWS

determine if the conservation strategy is functioning as intended and the anticipated benefits to the species are being realized.

The California Department of Fish and Wildlife (CDFW) NCCP program was authorized by the California Natural Community Conservation Planning Act of 1991 (Fish and Game Code Section 2800) and created a Statewide initiative to identify and provide for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. The purpose of the NCCP program is to have a broad-based approach to ecosystem conservation to protect and perpetuate biological diversity. This strategy differs from the objectives of the California and Federal ESAs, which focus on the preservation of individual species. The NCCP authorizes CDFW to achieve the goals of its programs by taking three steps: 1) negotiate agreements with any person for the purpose of preparing and implementing an NCCP to provide comprehensive management and conservation of multiple wildlife species (Fish and Game Code Section 2810); 2) issue non-regulatory guidelines to develop and implement NCCPs; and 3) authorize the “taking” of any candidate species whose “conservation, protection, restoration, and enhancement is provided for” in an approved NCCP Plan (see Fish and Game Code Section 2830).

The Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) documents a plan to accomplish both water conservation and environmental objectives (Appendix 7-7a). The primary water conservation objective is the storage of water in aquifers during times of surplus for later recovery during times of shortage. The primary environmental objective is to set aside large areas of KWB Lands for threatened and endangered species and other sensitive species and to implement a program to protect and enhance the habitat. The project applicant and landowner is KWBA. Section 3.2.2 of the KWB HCP/NCCP Implementation Agreement (Appendix 7-7a) states that “Upon issuance of the Section 10(a) Permit, the Service shall monitor the implementation of the Section 10(a) Permit, this Agreement, the KWB HCP and KWBA’s actions thereunder in order to insure compliance with this agreement.”

7.0.4.2.2 Agreement between KCWA and KWBA regarding Cross Valley Canal

KWBA and KCWA reached agreement on October 16, 2000 on the *Cross Valley Canal/Kern Water Bank Operating Guidelines During Shallow Groundwater Conditions* (Appendix 7-5e). The agreement protects the Cross Valley Canal (CVC) and KWBA facilities and provides respective project flexibility. The agreement consists of a groundwater monitoring program, groundwater recharge management, and CVC operations management. The groundwater monitoring program included the installation of additional piezometers along the CVC in areas where the CVC lining is below grade and the formation of a monitoring and evaluation plan. Under the groundwater recharge management strategy, KWBA manages recharge operations to ensure that the groundwater gradient is away from the CVC during shallow groundwater conditions to prevent flow into the CVC. In accordance to CVC operations management, the CVC is operated in such a manner as to maintain higher than normal pool levels.

7.0.4.3 CEQA Mitigation Measures With/Without Performance Standards

7.0.4.3.1 1997 Monterey Initial Study and Addendum

The 1997 Initial Study and Addendum to Monterey Agreement EIR of the Kern Water Bank Authority, Kern Water Bank HCP/NCCP (1997 Monterey IS and Addendum) presents mitigation measures that apply to KWB activities (see Appendix 7-6a). KWBA is required to implement the mitigation measures as written. The mitigation measures from the 1997 Monterey IS and Addendum that are included in this REIR have clear, enforceable performance standards that can be relied upon to reduce potentially significant impacts to less-than-significant impacts.

7.0.4.3.2 2016 Kern Water Bank Authority Resolution

KWBA passed a resolution in April 2016 (see Appendix 7-6b) which commits KWBA to implementing the mitigation measures included in the REIR that are not in other documents discussed above. KWBA is required to implement the mitigation measures as written. These mitigation measures have clear, enforceable performance standards that can be relied upon to reduce potentially significant impacts to less-than-significant impacts.

7.0.4.4 Other Legally Binding Documents With/Without Performance Standards

The KWB is operated in conformance with several legally binding documents. The 1995 Memorandum of Understanding Regarding Operation and Monitoring of the KWB Groundwater Banking Program (1995 KWB MOU) is one such document that is a legally binding document between KWBA participants, and Buena Vista Water Storage District, Rosedale-Rio Bravo Water Storage District, Kern Delta Water District, Henry Miller Water District, and West Kern Water District (see Appendix 7-5a). The 1995 KWB MOU, as with other similar types of documents, may or may not have clear performance standards that meet CEQA requirements; generally these types of documents are not prepared with the intent of meeting CEQA mitigation measure and performance standards and, therefore, typically do not meet CEQA requirements for mitigation.

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7.1 SURFACE WATER AND GROUNDWATER HYDROLOGY (NEW)

7.1 SURFACE WATER AND GROUNDWATER HYDROLOGY (NEW)

7.1.1 INTRODUCTION

7.1.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Sections 7.1 and 7.2 identified potential impacts to surface water hydrology, water quality, and water supply, and groundwater hydrology and quality, respectively, as a result of the transfer of the Kern Fan Element. This section describes the potential impacts of KWB activities on surface water and groundwater hydrology. It contains substantial new information developed specifically for this REIR. Consequently, this section replaces those parts of DEIR Sections 7.1 and 7.2 relating to impacts of KWB activities on surface water and groundwater hydrology. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts. Impacts of KWB activities on surface water and groundwater water quality are analyzed in Section 7.2, Surface and Groundwater Water Quality.

The impacts analysis consisted of the day-to-day operational decisions of the KWBA for the KWB; no analysis of the decisions of KWB member agencies and/or where they store their water, in the absence of KWB, was conducted. Alternatives to the KWB as part of the proposed project were discussed in Chapter 11 of the Monterey Plus DEIR.

7.1.1.2 Analytical Method

The California Department of Water Resources (Department or DWR) conducted a quantitative assessment of the impacts of KWB activities on groundwater resources in Kern County subbasin No. 5-22.14 (as identified in DWR Bulletin 118) using the DWR Kern Water Bank Model (DWR KWB Model). The DWR KWB Model is a refined version of an existing groundwater model (Kern Water Bank Authority [KWBA] Model) of the KWB area, developed by KWBA with assistance from its consultant, Amec Foster Wheeler.¹

Groundwater Model Overview

The DWR KWB Model simulated response of the groundwater aquifer to stresses such as groundwater recharge and pumping by predicting groundwater elevations at each of the model cells throughout the model domain. The model domain spans 28 miles (east-west) by 17 miles (north-south) as shown in Figure 7.1-1. The model boundary was originally chosen by KWBA to be far enough from the KWB property boundary to enable analysis and evaluation of impacts of KWB activities on the underlying groundwater aquifer without significant influence from groundwater conditions beyond the model domain. The model domain included several municipal and agricultural entities with some fully included inside the model domain and some partially included, as shown in Figure 7.1-1.

Key features of the DWR KWB Model are summarized in Table 7.1-1. The model grid is shown in Figure 7.1-2.

Model Feature	Description
Model Domain	The model domain spans 28 miles (east-west) by 17 miles (north-south). It covers a total area of 301,000 acres, including the Elk Hills area (48,300 acres), which is included in the model domain but the corresponding model cells in that area are inactive due to thinning out of the aquifer south and west of the California Aqueduct. Approximate distances from the model boundary to the edges of Kern Water Bank are as follows: northern edge: 6 miles; southern edge: 5.2 miles; eastern edge: 10 miles; western edge: 7.7 miles.
Model Grid	The model domain is horizontally discretized into a rectangular mesh, consisting of 39,300 model cells of variable sizes. Model cells are relatively finer inside the KWB area and coarser outside the KWB area.
Model Layering	The model is vertically discretized into five layers with varying thicknesses (from shallow to deep): Layer 1: 22 to 188 feet (average 100 feet); Layer 2: 196 to 235 feet (average 200 feet); Layer 3: uniformly 200 feet; Layer 4: uniformly 200 feet; Layer 5: 130 to 476 feet (average 195 feet).
Boundary Condition	The boundary on all sides except the southwest are leaky; boundary fluxes are governed by time-varying, general-head boundary conditions, developed using observed historical groundwater elevations.
Historical Calibration Period	The historical simulation period is from 1988 through 2014, which includes 20 years of KWB operations (1995–2014); stress periods and time steps are monthly. The model was calibrated by comparing simulated groundwater elevations with historical observed groundwater elevations at monitoring wells. Model calibration is discussed in detail in the DWR KWB Groundwater Model Technical Report (Appendix 7-2).

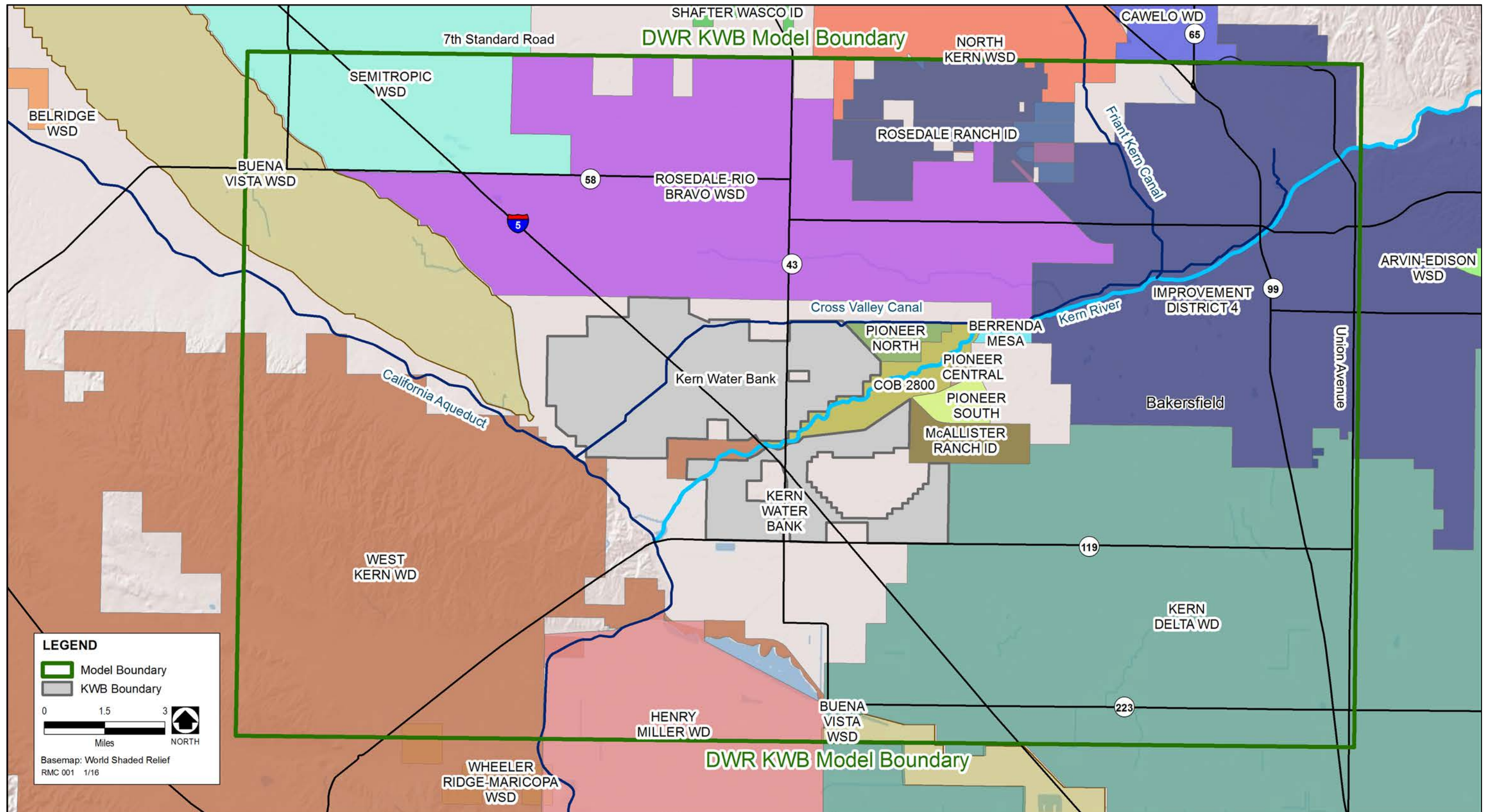


FIGURE 7.1-1. DWR KWB Model Domain and Nearby Municipal and Agricultural Entities

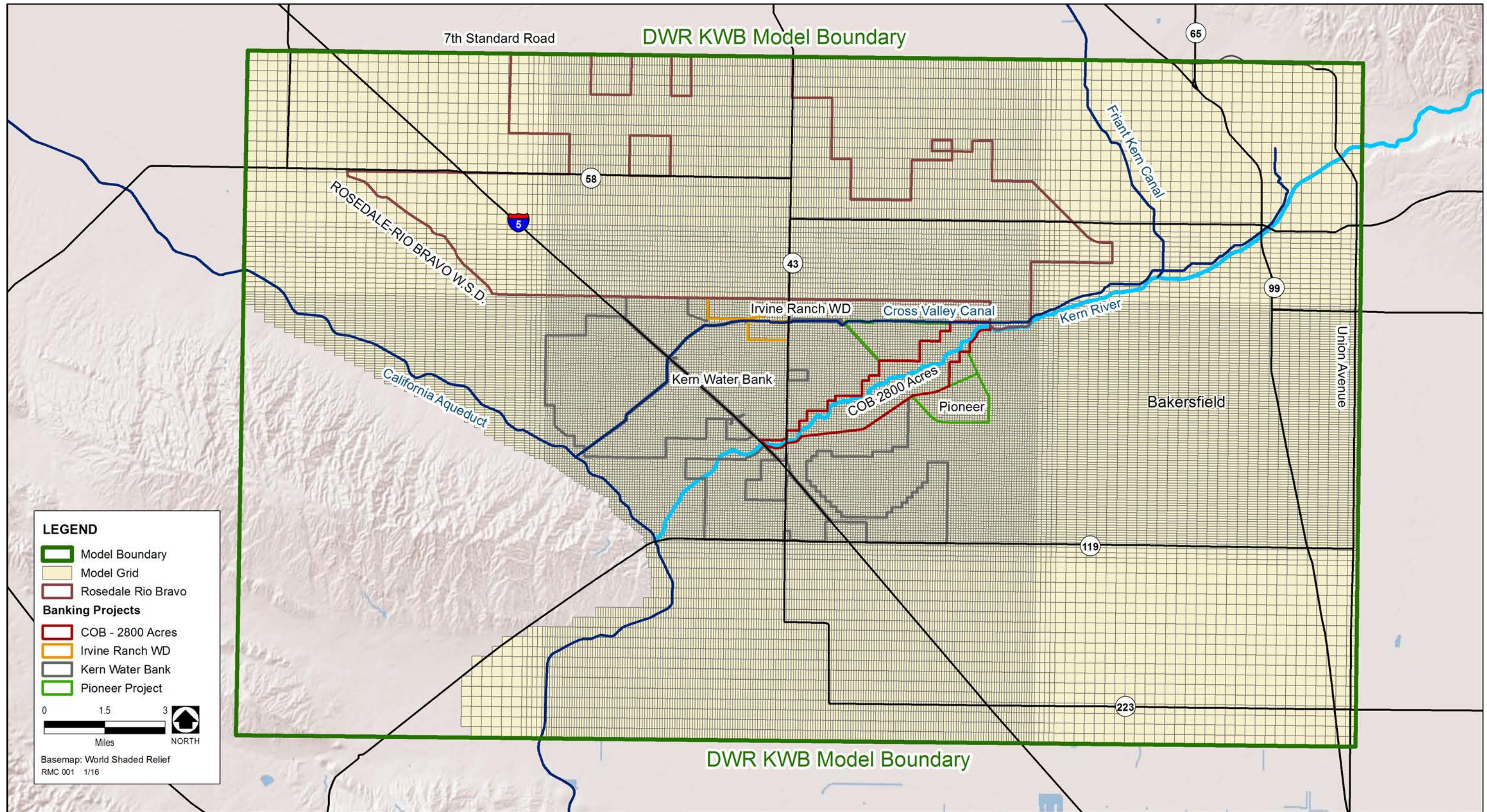


FIGURE 7.1-2. DWR KWB Model Grid

Groundwater Impact Analysis

Potential groundwater impacts resulting from operations of past, existing, and future KWB facilities were evaluated using the DWR KWB Model under different hydrologic conditions and levels of land use development. To isolate the effects of the KWB, potential impacts were evaluated by comparing simulated groundwater elevations from two model runs: (1) “With KWB Operations,” which included KWB recharge and recovery under historic and projected future conditions; and (2) “Without KWB Operations,” which assumed no recharge or recovery from KWB facilities under the same historic and projected future conditions. All other model parameters were kept the same in the two model runs to isolate the potential impacts of KWB activities.

DWR KWB Model Scenario Development

The following three modeling scenarios were developed to evaluate impacts of KWB activities under different levels of development (i.e., historic, existing conditions, and build-out conditions) within the model domain:

1. Analysis of Past Operations (APO): Simulation of groundwater system response based on past (1995–2014) KWB activities under historic land use conditions.
2. Analysis of Future Operations—Existing Conditions (AFO-EC): Simulation of groundwater system response based on projected future KWB activities under existing (2015) levels of development.
3. Analysis of Future Operations—Build-out Conditions (AFO-BC): Simulation of groundwater system response based on projected future KWB activities under build-out (2030) levels of development.

The model simulation period for the APO scenario is a 20-year past period (1995-2014) using the historical hydrology from 1995 through 2014. The model simulation period for both AFO scenarios is a 21-year future period (2015-2035) using historical 2015 hydrology in simulation year 1 (2015) and repeating the historical 1995-2014 hydrology for simulation years 2 to 21 (2016-2035).

These scenarios are briefly described below. More detailed descriptions of these scenarios are provided in Appendix 7-2.

1. Analysis of Past Operations (APO)

The historical calibration run of the DWR KWB Model was used to evaluate impacts of past KWB operations. It simulated the years 1988 through 2014, but the focus of the APO scenario was the 20-year period of KWB activities from 1995 through 2014. The APO scenario included 1995-2014 urban and agricultural land uses, operation of recharge and recovery facilities, and hydrologic conditions in the entire model domain, which included other groundwater banking projects that were operational within the model domain during the period from 1995 through 2014.

The DWR KWB Model domain encompassed about 470 square miles (including Elk Hills area, an inactive model area of about 70 square miles south and west of the California Aqueduct) with agricultural land use and urban development. For the APO modeling scenario, 1995-2014, land use and crop data were analyzed to determine monthly agricultural and urban water demands. Available 1995-2014 surface water deliveries were incorporated into a model pre-processor to calculate monthly groundwater pumping by land use sections within the model domain.

Historical surface water deliveries for recharge in the KWB came from three sources: Kern River flows, SWP supplies via the California Aqueduct, and Central Valley Project (CVP) supplies via

the Friant-Kern Canal. Recharge ponds within the KWB Lands were used to recharge water from these sources.

The APO “With KWB Operations” scenario is the same as the historical calibration run of the DWR KWB Model. The APO “Without KWB Operations” scenario was constructed by removing 1995-2014 KWB recharge and recovery operations from the historical calibration run. Historical recharge of floodwater in the KWB area also was removed under the “Without KWB Operations” scenario. Both of these changes were made to isolate the potential impacts of day-to-day KWB operations and maintenance activities. Modeling assumptions, including their supporting explanations, are described in Appendix 7-2.

2. Analysis of Future Operations—Existing Conditions (AFO-EC)

The AFO-EC scenario evaluated potential impacts of KWB operations in future under the existing conditions, which correspond to the 2015 level of development in the model area. The 2015 land use conditions and urban water demand data were obtained from the current land use maps and city/county planning data and documents. Agricultural and urban water demand and groundwater pumping were calculated using the same methodology and model pre-processor tool that were used during development of the calibration model run, but with data corresponding to the 2015 levels of land use development.

The DWR KWB Model was run with this fixed level of development for a 21-year future period (2015-2035). Since the future hydrology is unknown, the historical 2015 hydrology is used for the simulation year 1 (2015) and the historical 1995-2014 hydrology was repeated for the simulation years 2 to 21 (2016-2035). The 21-year future simulation period includes a mix of water year types: wet years (1995, 2006, and 2011); average years (1999, 2000, 2010); a dry year (2001); and extended droughts (2007-2009; 2012-2014).

Future surface water deliveries to the KWB under the AFO-EC scenario were assumed to be similar to historical deliveries of surface water from the same three sources. This assumption is consistent with the Department’s estimate of future Table A deliveries for existing and future build-out conditions, as specified in the Department’s 2013 SWP Delivery Reliability Report.²

Although the APO scenarios included the historical (1995-2014) timing of recharge and recovery facilities as they came into operation, the AFO-EC scenario assumed that all existing infrastructure for recharge and recovery was in place at the start of the model simulation period. Due to increased recharge pond area in 2015 relative to 1995-2014 recharge pond area, the KWB would be able to recharge more water during future wet years. Therefore, future recharge volume in KWB ponds was increased, based on available water for recharge from the above-mentioned three KWB recharge water sources under a hydrologic condition similar to the 1995–2014 period.

Recovery from the KWB and other groundwater banking facilities within the model domain for the first year of the AFO-EC simulation was assumed to be the same as 2015 pumping (January to September—measured pumping, and October to December—projected pumping). For the remaining 20 years (years 2 to 21) of the future simulation, historical recharge and recovery in groundwater banks, including the KWB, was assumed to be the same as that during the 1995–2014 period. The AFO-EC general head boundary conditions were assumed to follow similar patterns of fluctuations as the historical hydrologic period, with a starting point of the end of December 2014 simulated groundwater elevations at boundary control points from the historical calibrated model.

The AFO-EC “With KWB Operations” scenario included historical (1995–2015) recharge and recovery operations, while the AFO-EC “Without KWB Operations” scenario entirely removed the historical recharge and recovery operations. Historical recharge of floodwater in the KWB area also was removed under the “Without KWB Operations” scenario. Both of these changes were made to isolate the potential impacts of day-to-day KWB operations and maintenance activities.

AFO-EC assumptions, including supporting explanations, are described in more detail in Appendix 7-2.

3. Analysis of Future Operations—Build-out Conditions (AFO-BC)

The AFO-BC scenario evaluated the potential impacts of KWB operations in the future under the build-out conditions, which correspond to the 2030 level of development in the model area. The 2030 land use conditions and urban water demand data were obtained from city/county general plans and existing urban water management plans. Agricultural and urban water demand and groundwater pumping were calculated using the same methodology and model pre-processor tool that were used during development of the calibration model run, but with data corresponding to the 2030 levels of land use development.

The DWR KWB Model was run with this fixed level of development for a 21-year future period (2015-2035). Since the future hydrology is unknown, the historical 2015 hydrology is used for the simulation year 1 (2015) and the historical 1995-2014 hydrology was repeated for the simulation years 2 to 21 (2016-2035). The 21-year future simulation period includes a mix of water year types: wet years (1995, 2006, and 2011); average years (1999, 2000, 2010); a dry year (2001); and extended droughts (2007-2009; 2012-2014).

Future surface water deliveries to the KWB under the AFO-BC scenario were assumed to be similar to historical deliveries of surface water from the same three sources. This assumption was consistent with the Department’s estimate of future Table A deliveries for existing and future build-out conditions as specified in the Department’s 2013 SWP Delivery Reliability Report.³

Although APO scenarios included the historical timing of recharge and recovery facilities as they came into operation, the AFO-BC scenario assumed that all existing infrastructure for recharge and recovery was in place at the start of the model simulation period. It also included additional reasonably foreseeable future groundwater recharge and recovery operations-related projects that would be likely to come into operation in the model area before 2030. A list of these reasonably foreseeable future projects is provided in Table 7.1-2, and the locations of the projects are shown in Figure 7.1-3.

Due to increased recharge pond area in 2015 relative to 1995-2014 recharge pond area and the addition of new recharge facilities before 2030, the KWB would be able to recharge more water during wet years in the future. Therefore, future recharge volume in the KWB ponds was increased to the maximum capacity, based on available water for recharge from the above-mentioned three KWB recharge water sources under a hydrologic condition similar to the 1995–2014 period.

TABLE 7.1-2		
REASONABLY FORESEEABLE FUTURE PROJECTS INCLUDED IN THE AFO-BC MODELING SCENARIO		
Project Type	Agency	Project
Groundwater Banking	Kern Water Bank Authority	Kern Water Bank Recharge and Recovery Project
	Buena Vista Water Storage District and Rosedale-Rio Bravo Water Storage District	James Groundwater Storage and Recovery Project (proposed on former McAllister Ranch property)
	Rosedale-Rio Bravo Water Storage District	Drought Relief Project
Urban Development	Regional and Local Development Plans and Programs	City of Bakersfield General Plan
		Kern County General Plan
	City of Bakersfield	West Ming Specific Plan
		Rosedale Ranch (approved residential development)
		Saco Ranch (approved commercial development)
		Strand Ranch (approved residential and commercial development)
		Stockdale Ranch (approved residential development)
		Old River Ranch (approved residential and commercial development)
		Bakersfield Commons (approved commercial development)
		Ashe No. 4 (approved residential development)
	Kern County	Hosking Commercial Center (proposed commercial development)
Reina Ranch (proposed residential development and drill island for petroleum extraction)		
	Rosedale & Renfro Precise Development Plan	

Recovery from the KWB and other groundwater banking facilities for the first year of the AFO-BC simulation was assumed to be the same as 2015 pumping (January to September—measured pumping, and October to December—projected pumping). For the remaining 20 years (years 2 to 21) of the future simulation, historical recharge and recovery in the KWB was scaled up to include the additional pumping capacity from the three new wells expected to be operational in the next few years. For all other groundwater banks, recovery was assumed to be the same as during the 1995–2014 period, except that projected pumping because of new projects, such as Stockdale Ranch and the James Groundwater Storage and Recovery Project, were added.

AFO-BC general head boundary conditions were assumed to follow similar patterns of fluctuations as the historical hydrology, with a starting point of the end of December 2014 simulated groundwater elevations at boundary control points from the historical calibration model.

The AFO-BC “With KWB Operations” scenario included the historical (1995–2015) recharge and recovery operations, while the AFO-BC “Without KWB Operations” scenario entirely removed historical recharge and recovery operations. Historical recharge of floodwater in the KWB area was not included in the “Without KWB Operations” scenario. Both of these changes were made to isolate the potential impacts of day-to-day KWB operations and maintenance activities.

Summary of DWR KWB Model Scenarios

A summary of the three model scenarios for both “With KWB Operations” and “Without KWB Operations” is provided in Table 7.1-3.

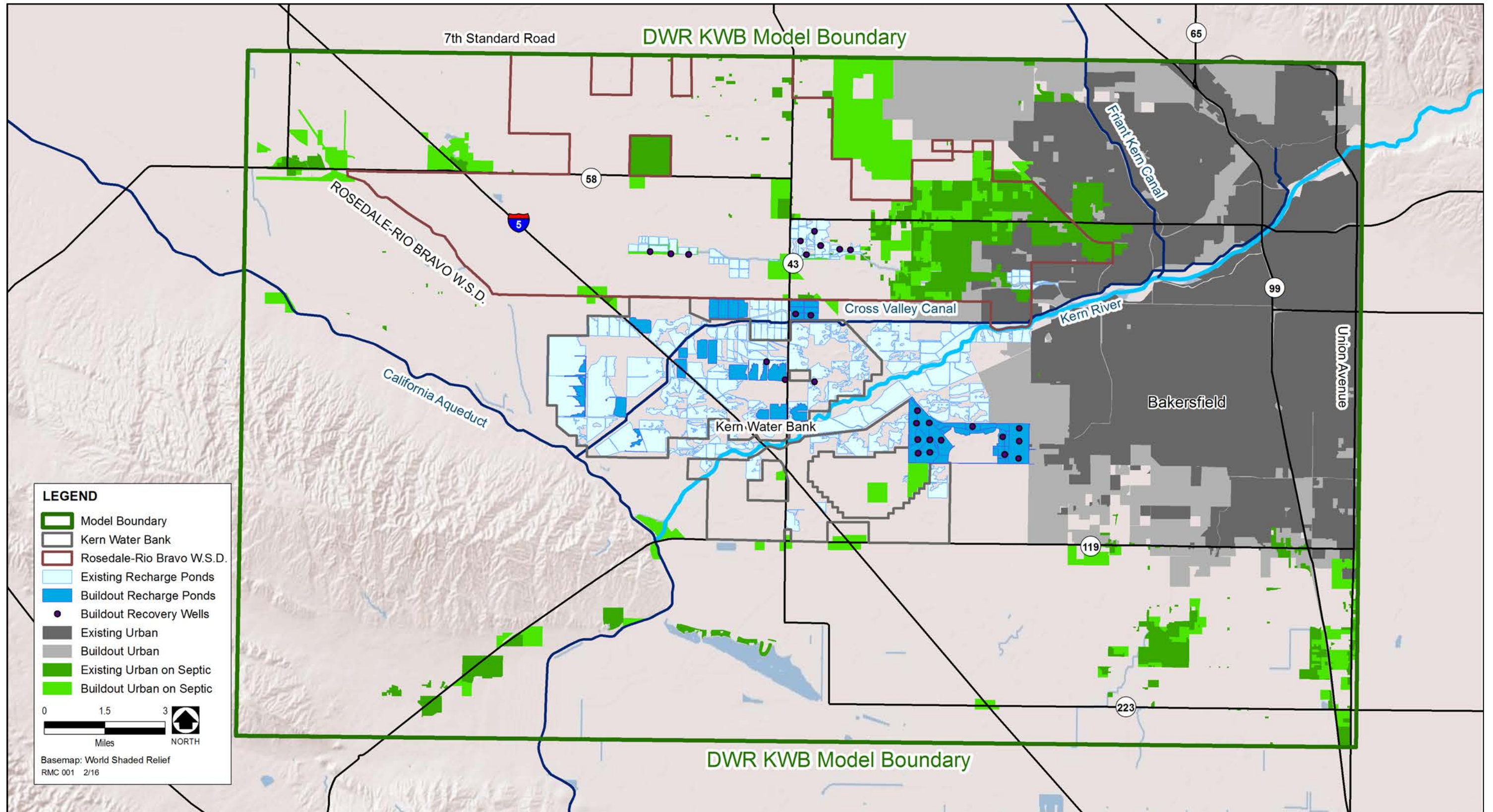


FIGURE 7.1-3. Location of Reasonably Foreseeable Future Projects Included in Build-out (2030) Conditions

**TABLE 7.1-3
SUMMARY OF KERN WATER BANK OPERATIONS MODELING SCENARIOS**

Model Component	APO		AFO-EC		AFO-BC	
	With KWB Operations	Without KWB Operations	With KWB Operations	Without KWB Operations	With KWB Operations	Without KWB Operations
Hydrologic Simulation Period	20 year simulation period (1995–2014 historic hydrology)	20-year simulation period (1995–2014 historic hydrology)	21-year simulation period from 2015 through 2035 (The hydrology of year 1 is similar to 2015 and years 2 to 21 are similar to 1995–2014 historical hydrology)	21 year simulation period from 2015 through 2035 (The hydrology of year 1 is similar to 2015 and years 2 to 21 used 1995–2014 historical hydrology)	21-year simulation period from 2015 through 2035 (The hydrology of year 1 is similar to 2015 and years 2 to 21 used 1995–2014 historical hydrology)	21-year simulation period from 2015 through 2035 (The hydrology of year 1 is similar to 2015 and years 2 to 21 used 1995–2014 historical hydrology)
Land Use (areas outside of KWB Lands)	1995–2014 Historic Land Use in the DWR KWB Model	1995–2014 historic land use in the DWR KWB Model	2015 level of land use in the model domain held constant for the 21-year future simulation period (2015–2035) Agricultural area ~ 132,000 acres Urban area ~ 56,000 acres	2015 level of land use in the model domain held constant for the 21-year future simulation period (2015–2035) Agricultural area ~ 132,000 acres Urban area ~ 56,000 acres	2015 level of land use in the model domain held constant for the 21-year future simulation period (2015–2035) Agricultural area ~ 110,000 acres Urban area ~ 83,000 acres	2015 level of land use in the model domain held constant for the 21-year future simulation period (2015–2035) Agricultural area ~ 110,000 acres Urban area ~ 83,000 acres
Land Use (on KWB Lands)	No agriculture on KWB lands	No agriculture on KWB lands	No agriculture on KWB lands	No agriculture on KWB lands	No agriculture on KWB lands	No agriculture on KWB lands
Agricultural Pumping (areas outside of KWB Lands)	7,935,432 AF (historical total for 1995–2014, a 20 -year period)	7,935,432 AF (historical total for 1995–2014, a 20-year period)	8,436,580 AF (total for 2016–2035, a 20-year period with constant 2015 level of agricultural land use)	8,436,580 AF (total for 2016–2035, a 20-year period with constant 2015 level of agricultural land use)	7,001,724 AF (total for 2016–2035, a 20-year period with constant 2030 level of agricultural land use)	7,001,724 AF (total for 2016–2035, a 20-year period with constant 2030 level of agricultural land use)
Agricultural Pumping (on KWB Lands)	No agricultural pumping	No agricultural pumping	No agricultural pumping	No agricultural pumping	No agricultural pumping	No agricultural pumping
Urban Pumping	Total volume: 700,272 AF	Total volume: 700,272 AF	Total volume: 1,592,424 AF	Total volume: 1,592,424 AF	Total volume: 1,652,826 AF	Total volume: 1,652,826 AF
KWB Recharge	Total volume after 6 percent loss: 2,006,372 AF	0 AF	Total volume after 6 percent loss: 2,112,325 AF (Note: All operational ponds in 2015 would be used for future recharge during 2015–2035)	0 AF	Total volume after 6 percent loss: 2,112,325 AF (Note: All operational ponds in 2015 plus an additional 1,090 acres of recharge ponds would be used for future recharge during 2015–2035)	0 AF
KWB Recharge Distribution	1995–2014 historical recharge distribution in the DWR KWB Model	None	Recharge distribution rearranged to match KWB recharge priority order. More water is recharged in eastern ponds	None	Recharge distribution rearranged to match KWB recharge priority order. More water is recharged in eastern ponds	None
KWB Recovery	Total volume: 1,389,113 AF	0 AF	Total volume: 1,546,368 AF (Note: All operational wells in 2015 would be used for future recovery during 2015–2035)	0 AF	Total volume: 1,614,236 AF (Note: All operational wells in 2015 plus three planned recovery wells would be used for future recovery during 2015–2035)	0 AF
KWB Recovery Distribution	1995–2014 historical recovery distribution in the DWR KWB Model	None	All operational wells in 2015 are used for future recovery during 2015–2035	None	All operational wells in 2015 plus 3 planned recovery wells are used for future recovery during 2015–2035	N/A
Other Water Banks Recharge & Recovery	Historic recharge/recovery in the DWR KWB Model	Historic recharge/recovery in the DWR KWB Model	Historic recharge/recovery in the DWR KWB Model	Historic recharge/recovery in the DWR KWB Model	Historic recharge/recovery in the DWR KWB Model	Historic recharge/recovery in the DWR KWB Model
Kern River Flooding on KWB Lands	Historical 1988–2014 flood water recharge in the KWB	0 AF	Historical 1995-2014 flood water recharge in the KWB plus additional recharge because of increased capacity for operational ponds in 2015	0 AF	Historical 1995–2014 flood water recharge in the KWB plus additional recharge because of increased capacity for operational ponds in 2015	0 AF
Boundary Conditions	1995–2014 historical boundary conditions in the DWR KWB Model	1995–2014 historical boundary conditions in the DWR KWB Model	1995–2014 historical boundary conditions in the DWR KWB Model are adjusted for 2015 conditions to follow similar pattern of fluctuations under historical hydrology, while starting from the December 2014 simulated groundwater elevations at boundary control points of the historical calibrated groundwater model.	1995-2014 historical boundary conditions in the DWR KWB Model are adjusted for 2015 conditions to follow similar pattern of fluctuations under historical hydrology, while starting from the December 2014 simulated groundwater elevations at boundary control points of the historical calibrated groundwater model.	1995–2014 historical boundary conditions in the DWR KWB Model are adjusted for 2015 conditions to follow similar pattern of fluctuations under historical hydrology, while starting from the December 2014 simulated groundwater elevations at boundary control points of the historical calibrated groundwater model.	1995-2014 historical boundary conditions in the DWR KWB Model are adjusted for 2015 conditions to follow similar pattern of fluctuations under historical hydrology, while starting from the December 2014 simulated groundwater elevations at boundary control points of the historical calibrated groundwater model.
Initial Conditions	Simulated December 1994 conditions from the historical calibrated model	Simulated December 1994 conditions from the historical calibrated model	Simulated December 2014 conditions generated by the APO-run "With KWB	Simulated December 2014 conditions generated by the APO-run "Without	Simulated December 2014 conditions generated by the APO-run "With KWB	Simulated December 2014 conditions generated by the APO-run "Without

**TABLE 7.1-3
SUMMARY OF KERN WATER BANK OPERATIONS MODELING SCENARIOS**

Model Component	APO		AFO-EC		AFO-BC	
	With KWB Operations	Without KWB Operations	With KWB Operations	Without KWB Operations	With KWB Operations	Without KWB Operations
			Operations"	KWB Operations"	Operations"	KWB Operations"
Aquifer Parameters	Aquifer parameters from the historical calibrated model	Aquifer parameters from the historical calibrated model	Aquifer parameters from the historical calibrated model	Aquifer parameters from the historical calibrated model	Aquifer parameters from the historical calibrated groundwater model	Aquifer parameters from the historical calibrated groundwater model
Future Projects on KWB Lands	Historic operation; therefore, no future projects	None	All currently active projects on KWB Lands	None	Groundwater operations related projects. (see Table 7.1-2)	None
Future Projects Outside KWB Lands	Historic operation; therefore, no future projects	None	All currently active projects outside KWB Lands	All currently active projects outside KWB Lands	Groundwater operations related projects. (see Table 7.1-2)	Groundwater operations related projects. (see Table 7.1-2)

7.1.1.3 Standards of Significance

The proposed approach to significance thresholds for surface water and groundwater hydrology includes thresholds from Appendix G of the California Environmental Quality Act (CEQA) Guidelines and the Monterey Plus EIR. For the purposes of this section, substantial changes are generally defined as changes beyond those normally observed in historical records and disproportionate to any documented information on groundwater in the basin.

A significant impact related to surface water and groundwater hydrology would occur if KWB activities would:

1. Substantially deplete groundwater supplies such that there would be a net deficit in aquifer volume.
2. Substantially deplete groundwater supplies such that there would be a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.
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 which would impede or redirect flood flows.
6. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or cause inundation by seiche, tsunami, or mudflow.
7. Alter water levels in a groundwater basin sufficiently to substantially impact existing infrastructure (e.g., conveyance facilities and residential septic systems).
8. Alter water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge.

7.1.2 ENVIRONMENTAL SETTING

The environmental setting is divided into two subsections: physical and regulatory settings. The physical subsection describes the physical setting in 1995 and the period between 1996 and 2014; additional data are presented for previous years when available and applicable.

7.1.2.1 Physical Setting in 1995

The physical setting in 1995 for surface and groundwater hydrology is described in Revised Appendix E (Section III, Existing Conditions and Surroundings – 1995).

7.1.2.2 Changes in Physical Setting between 1996 and 2014

This section summarizes the physical setting for surface water and groundwater hydrology during the years when KWB activities occurred (1996 through 2014).

Surface Water Hydrology

The KWB is located in an arid to semiarid region in the southern Central Valley of California. Annual precipitation in the project area averaged approximately 6 inches and varied from 3 to 13 inches in the 1988 to 2014 period (Figure 7.1-4). Most precipitation occurs from December through March (Figure 7.1-5).

Surface water deliveries for recharge in the KWB come from three sources: Kern River flows, the SWP via the California Aqueduct, and the CVP via the Friant-Kern Canal. An extensive conveyance network of lined and unlined canals delivers surface water to KWB recharge ponds.

The Kern River, with a mean annual flow of approximately 720,000 acre-feet (AF), originates at the southern Sierra Nevada and terminates at the Kern River Intertie Basin at the California Aqueduct. The Kern River is fed by annual snowmelt, is used for generation of hydroelectric power, and provides flood control, recreation, and water storage via the Lake Isabella reservoir.

Kern River annual flows are ranked based on April–July runoff rates. April–July runoff rates were compared to the 1894 to 2014 average April–July runoff rate of 461,000 AF and percent of average rankings was calculated. April–July flows in 2011 (wet year) were at 205 percent of average, while 2007 flows were at 27 percent of average. The April–July and August–March annual Kern River flows at the First Point of Measurement, located above Gordon’s Ferry in northeast Bakersfield, from 1988 through 2014, are shown in Figure 7.1-6. Average April–July, August–March, and total annual Kern River flows for the 1988–2014 period are approximately 400,000 AF, 240,000 AF, and 640,000 AF, respectively. The maximum and minimum annual Kern River flows of 1,718,000 AF and 175,000 AF occurred in 1998 and 2014, respectively. The 1988–2014 hydrologic record for the Kern River includes a wide range of annual flow conditions, including both individual critically dry and wet years, as well as consecutive years with both types of flow conditions.

The California Aqueduct is the main facility conveying SWP water to agencies with SWP long-term water supply contracts. Recovered water from banking activities is pumped into the California Aqueduct for water banking participants. The KWB Canal and the Cross Valley Canal (CVC) transport water from the California Aqueduct to the KWB and other neighboring water banking projects. The KWB Canal conveys recovered water to be pumped back into the California Aqueduct.

SWP annual deliveries are based on hydrologic conditions, SWP reservoir storage, compliance with State and federal regulatory permits and other requirements, delivery capability, and combined requests from SWP contractors. Table A of the water supply contract lists annual maximum amounts of water that can be requested by each SWP contractors. The cumulative total Table A amount is 4,172,686 AF, which includes 982,730 AF for Kern County Water Agency. Each year, the Department allocates the available SWP water to the contractors as a percentage of Table A amounts based on the above conditions.

The Friant-Kern Canal carries San Joaquin River water south from Millerton Lake to its terminus at the turnout for the Arvin-Edison Canal, which supplies Arvin-Edison Water Storage District with its allocation of CVP water. The CVC and the Kern River channel are used to transport CVP water from the Friant-Kern Canal to water banking projects in the KWB area.

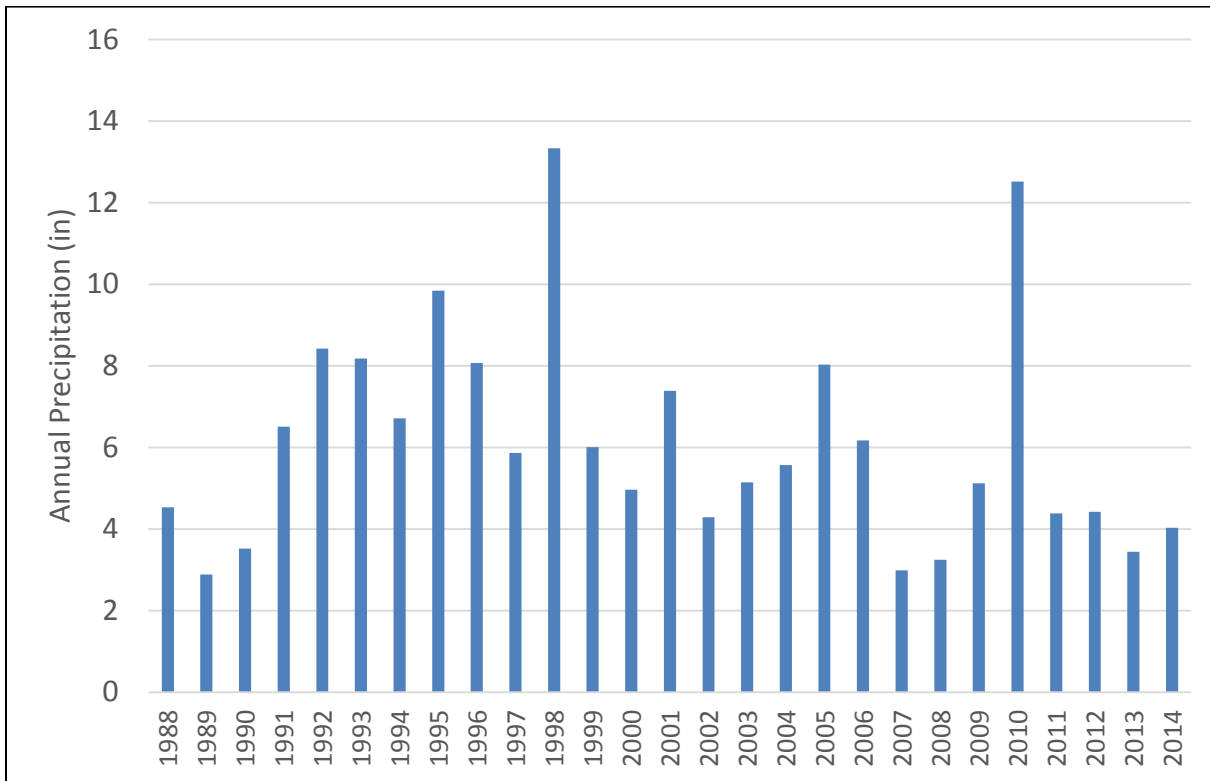


FIGURE 7.1-4. Annual Precipitation in the Vicinity of the Kern Water Bank (Bakersfield Airport), 1988–2014

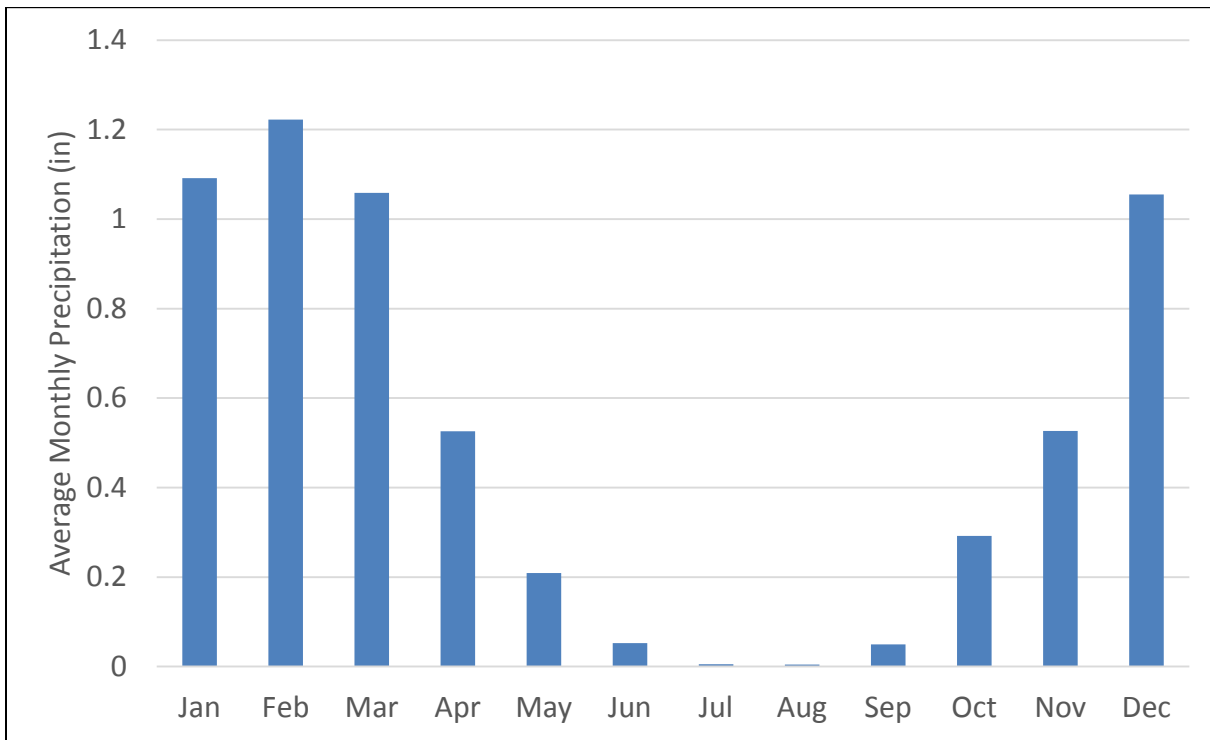


FIGURE 7.1-5. Monthly Average Precipitation in the Vicinity of the Kern Water Bank (Bakersfield Airport), 1988-2014

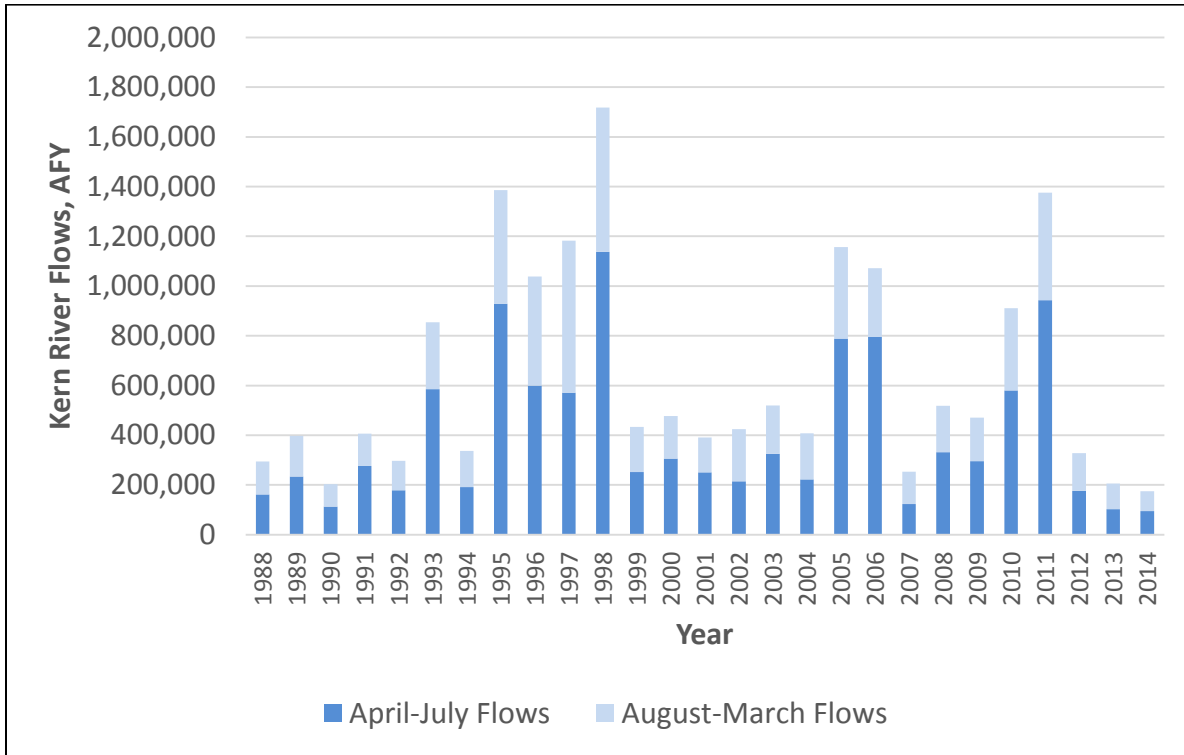


FIGURE 7.1-6. Historical Annual Kern River Flows at First Point of Measurement (above Gordon’s Ferry), 1988–2014

Groundwater Hydrology

The aquifer system in the KWB area is part of the Kern County Subbasin, designated as Groundwater Basin Number 5-22.14 in the Department’s Bulletin 118, Update 2003.⁴ The Kern County Subbasin is located in the portion of the San Joaquin Valley Groundwater Basin in the Tulare Lake Hydrologic Region. The aquifer system is generally thick, with groundwater wells commonly exceeding 1,000 feet in depth. The hydrogeology of the KWB area is dominated by the Kern River alluvial fan. In general, upper portions of the alluvial fan deposits form an unconfined to semi-confined aquifer system that provides a large groundwater recharge capacity. The Corcoran clay, where present, divides the upper aquifer from the confined aquifer. The Corcoran clay is not laterally continuous across the subbasin and is absent in eastern parts of the basin. A more detailed description of the local geology is provided in Section 7.8, Geology, Soils, and Mineral Resources.

Groundwater elevations in the KWB area vary from 100 to 300 feet above mean sea level or approximately 50 to 250 feet below ground surface. Groundwater flow directions vary in the KWB area in response to the artificial recharge and pumping stresses on the aquifer. Figure 7.1-7 shows the groundwater elevation contour map in 2012, following a year of recharge in the KWB area. The contour map shows that higher groundwater elevations in the KWB area resulted from recharge in 2011. Higher groundwater elevations also occur along the Kern River in the eastern parts of the KWB area. Figure 7.1-8 shows the groundwater elevation contour map in 2010, following the 2007-2009 pumping period in the KWB area. The contour map shows lowering of groundwater elevations due to KWB pumping.

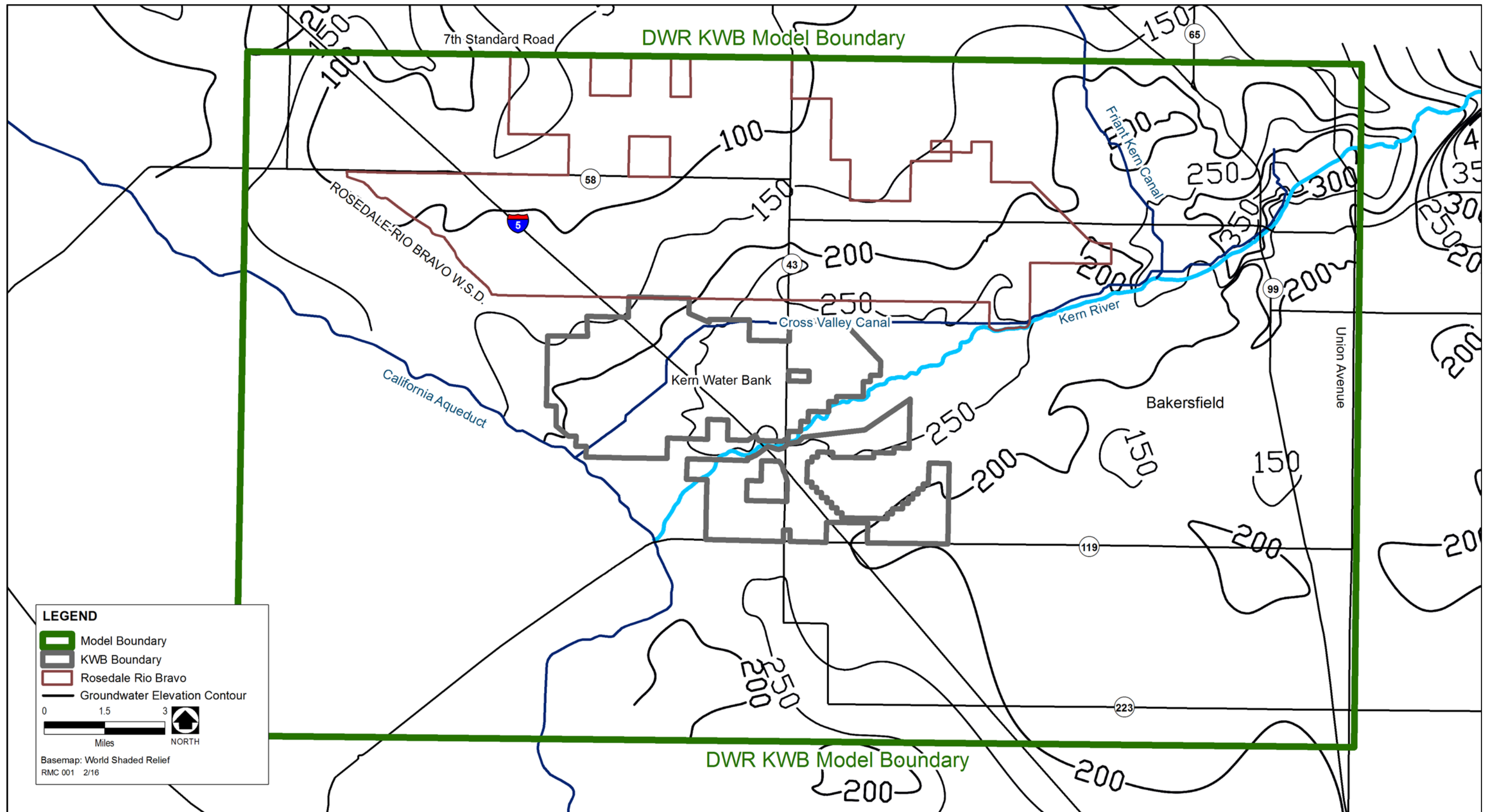


FIGURE 7.1-7. Groundwater Elevation Contour Map in 2012

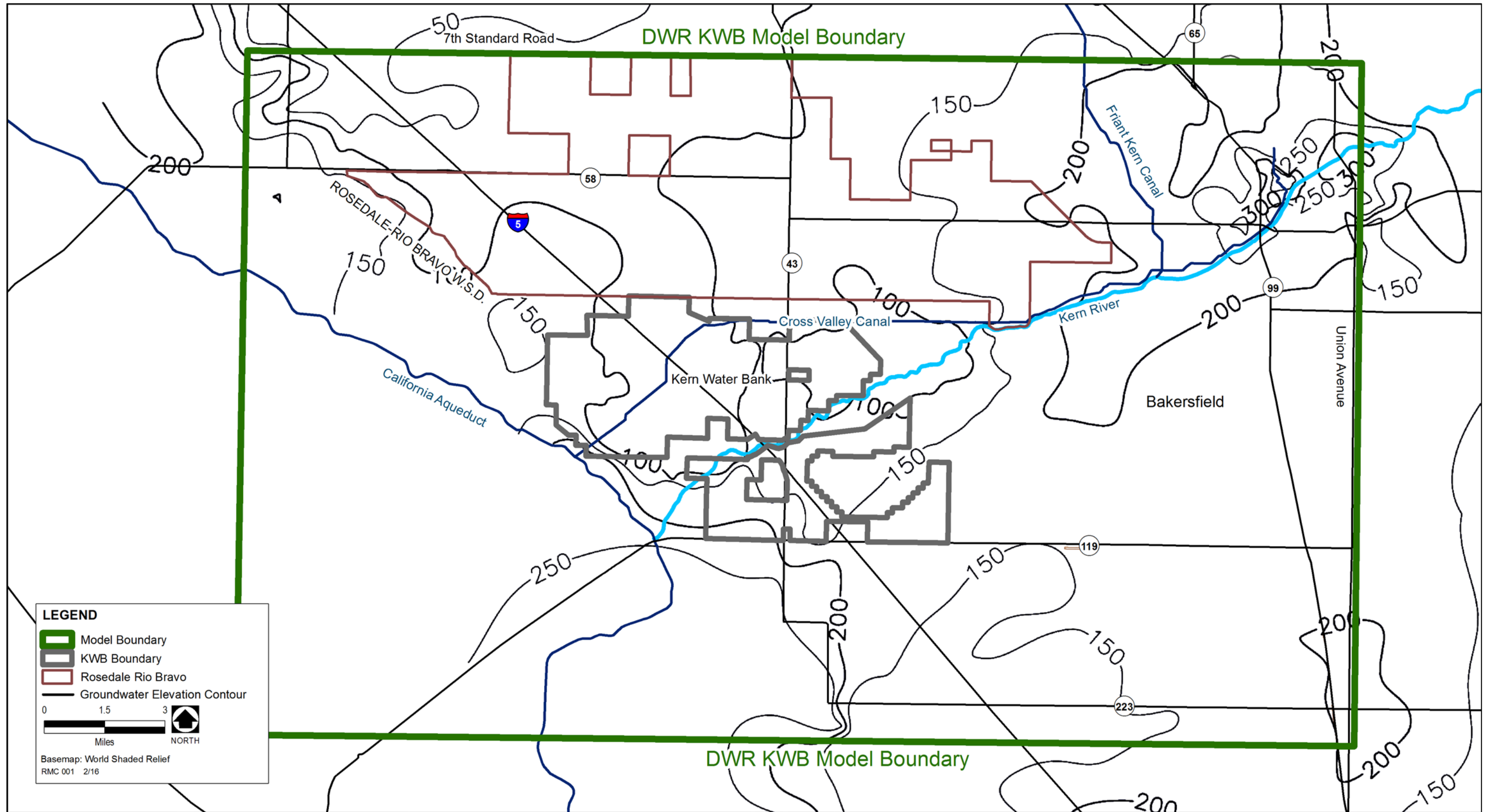


FIGURE 7.1-8. Groundwater Elevation Contour Map in 2010

TABLE 7.1-4
ANNUAL WATER DELIVERY TO THE KERN WATER BANK BY SOURCE,
1995–2014
 (Volume in acre-feet)

Year	SWP	CVP	Kern River	Total
1995	70,329	47,035	104,896	222,260
1996	87,492	49,893	36,490	173,875
1997	40,049	28,806	43,407	112,262
1998	51,155	55,248	196,683	303,086
1999	26,011	10,563	179	36,753
2000	19,455	8,124	-	27,579
2001	10,030	-	-	10,030
2002	13,439	-	-	13,439
2003	40,374	-	-	40,374
2004	18,065	-	-	18,065
2005	327,418	59,239	900	387,557
2006	178,065	40,244	64,924	283,233
2007	16,728	-	-	16,728
2008	-	-	-	-
2009	-	-	-	-
2010	33,131	-	-	33,131
2011	352,297	68,230	26,621	447,148
2012	8,918	-	-	8,918
2013	-	-	-	-
2014	-	-	-	-
Total	1,292,956	367,382	474,100	2,134,438
Total by Percent	61%	17%	22%	100%

Kern Water Bank Water Supply

Water recharged into the KWB comes from the SWP via the California Aqueduct, the CVP via the Friant-Kern Canal, and Kern River flood flows. Descriptions of these surface water supplies, as well as the associated conveyance network, are provided in the Revised Appendix E.

During the 1995–2014 period, 2,134,438 AF of water was delivered to KWB for recharge. The distribution of the delivered volume during the 20-year period by source is as follows: SWP (Table A and Article 21): 1,292,956 AF; CVP (Friant-Kern section 215 of Reclamation Reform Act of 1982 water): 367,382 AF; and Kern River flood flows: 474,100 AF. Annual deliveries to KWB by source are shown in Table 7.1-4.

Kern Water Bank Facilities

The KWB area includes portions of several KCWA water district service areas and associated banking projects, including the KWB. Figure 7.1-9 shows KWB area facilities.

The KWB facilities include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter pipelines. Approximately 28 miles of small-diameter and 5 miles of large-diameter (> 36-inch-diameter) pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct (see Figure 7.1-9).

Between 1996 and 2014, maintenance and operational activities included the replacement of recovery wells and the servicing and maintenance of all wells involved in groundwater recovery. Periodic berm repair and mowing of the KWB Canal banks to control excessive vegetation growth were ongoing maintenance activities. Existing fencing was maintained and additional fencing installed as needed. Other management activities included trash cleanup and removal of illegally dumped materials, environmental cleanup, and monitoring of third-party operations and cleanup activities.^{5,6,7,8,9,10,11}

Major groundwater recharge and recovery operations at water banking facilities in Kern County have affected groundwater elevations and flow directions in the KWB area. During the 1995–2014 period, 2,006,372 AF of surface water was recharged and 1,389,113 AF of groundwater was recovered at KWB. Figure 7.1-10 shows monthly recharge and recovery at the KWB from 1995 through 2014. Higher groundwater levels correspond to years with recharge activities, and lower water levels indicate recovery periods. During recovery periods, pumping depressions developed near KWB and other recharge/recovery projects in the area, causing changes in groundwater elevations and flow directions.

Figure 7.1-11 shows the locations of the Kern Fan Monitoring Committee wells in the DWR KWB Model domain. Groundwater elevation hydrographs from three multi-completion monitoring wells are presented in Figures 7.1-12 to 7.1-14. These wells are selected from areas within three local groundwater banks to provide a general idea of fluctuations in observed groundwater elevations caused by KWB recharge and recovery operations, as well as the neighboring Rosedale and 2800 Acres groundwater banking projects. Figure 7.1-12 shows groundwater level fluctuations from two different well perforation intervals (210 feet to 310 feet and 610 feet to 700 feet as shown in the color legend at the bottom of the graph) at a monitoring well inside Rosedale. Figure 7.1-13 shows groundwater level fluctuations from four different well perforation intervals (45 feet to 65 feet; 100 feet to 150 feet; 223 feet to 375 feet; and 560 feet to 650 feet) at a monitoring well in 2800 Acres groundwater banking project. The data symbols that are “unfilled” on the graph indicate that the water level has fallen below the bottom of the corresponding well perforation interval, resulting in the dry well condition at that well depth interval. Figure 7.1-14 shows groundwater level fluctuations from four different well perforation intervals (110 feet to 130 feet; 285 feet to 345 feet; 515 feet to 555 feet; and 645 feet to 690 feet) at a monitoring well inside KWB boundary. This well becomes dry at the topmost perforation interval as shown by the “unfilled” green square symbols on the graph. The fluctuations of groundwater elevations in these three wells range from 160 feet to 330 feet. All three wells show similar trends of increasing and decreasing groundwater elevations, with the least amount of groundwater decline during 2007-2010 occurring in the Rosedale well.

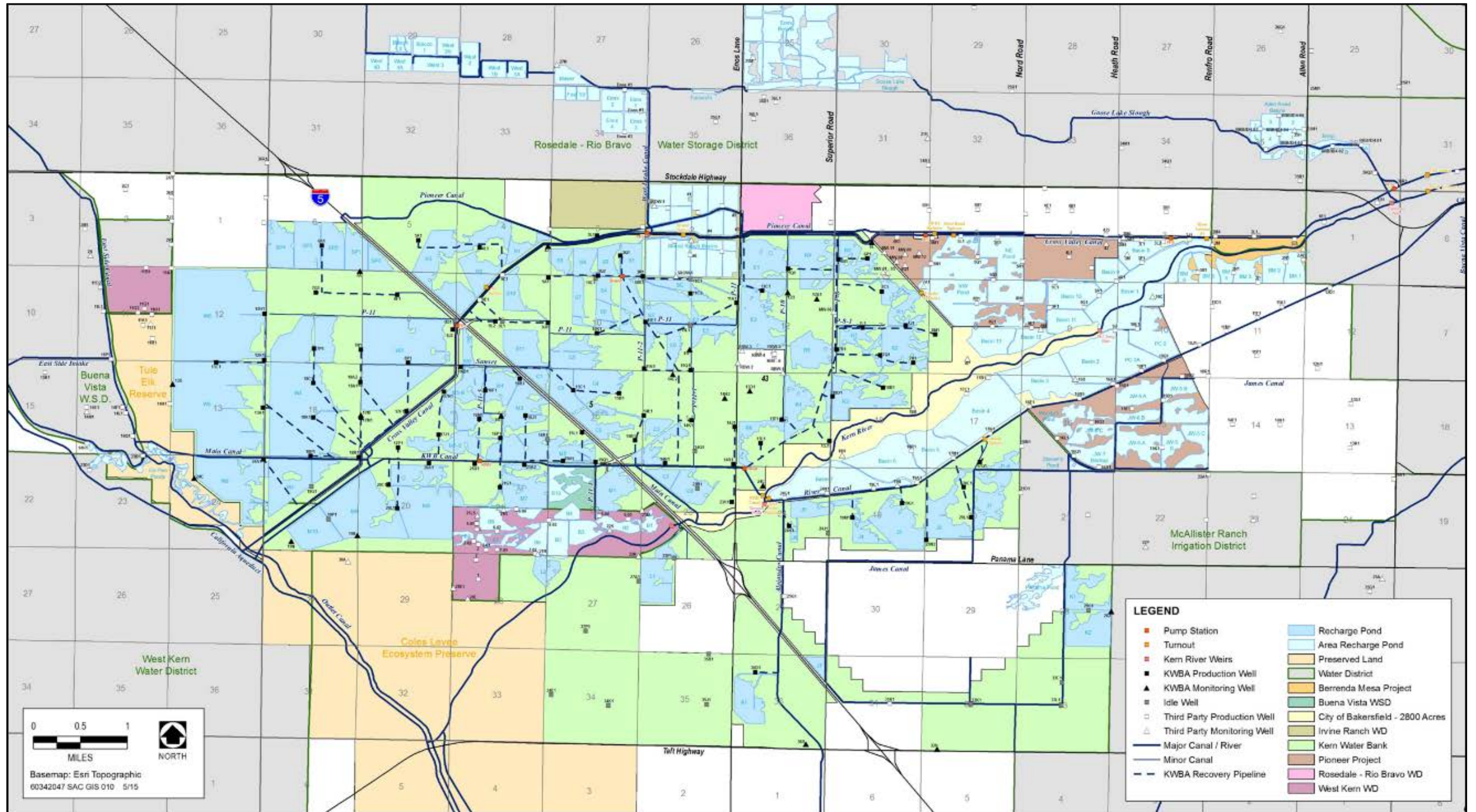


FIGURE 7.1-9. Kern Water Bank Area Facilities

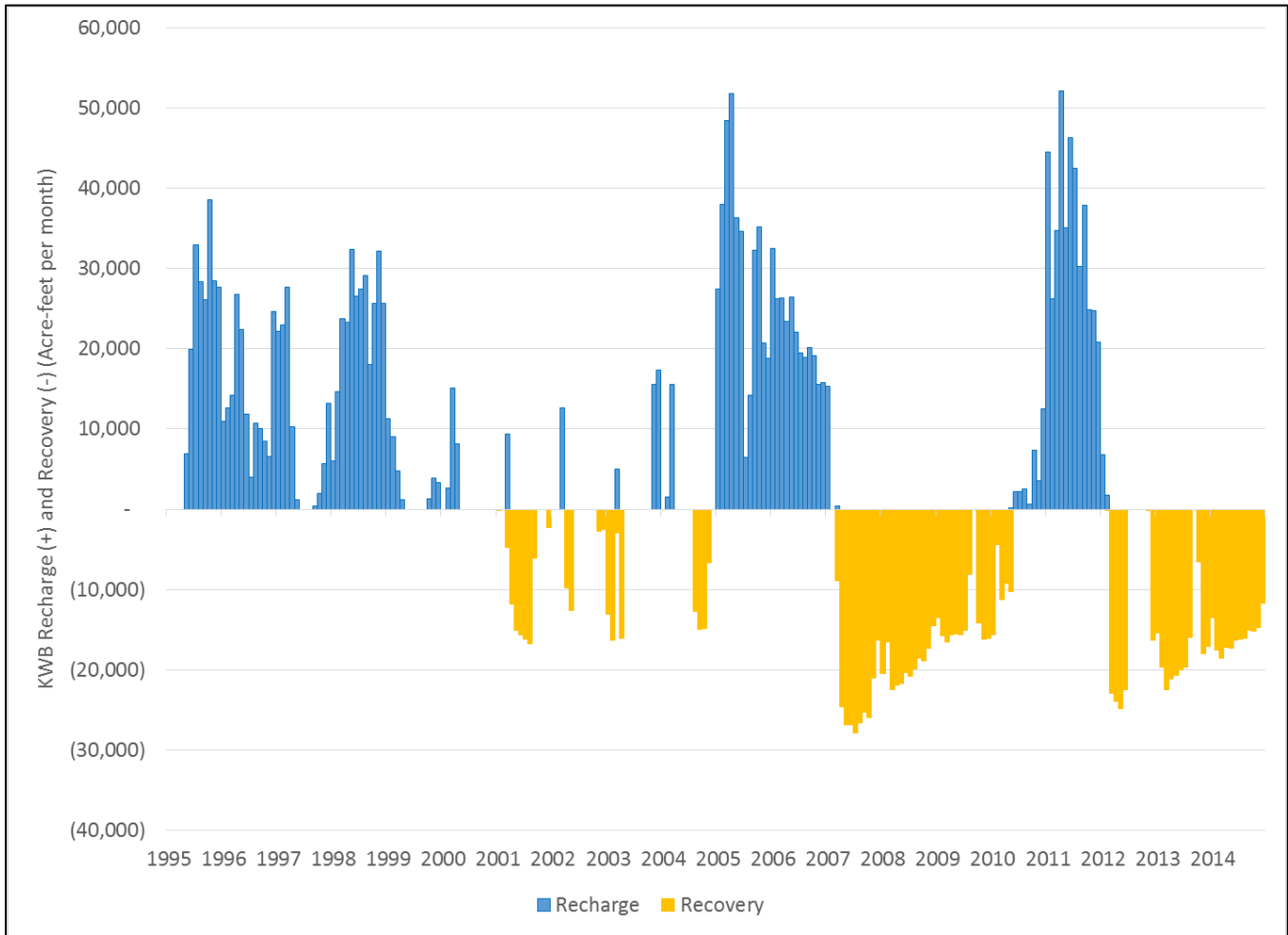


FIGURE 7.1-10. Monthly Recharge and Recovery at the Kern Water Bank, 1995–2014

7.1.2.3 Regulatory Setting in 1995

The regulatory setting in 1995 for KWB activities is generally unchanged from Section 7.1.2.3, Regulatory Setting in 1995, presented in the Monterey DEIR. Key regulations are described below.

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 known as the Clean Water Act (CWA). The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. It gave the U.S Environmental Protection Agency (EPA) the authority to set ambient water quality standards for surface waters and set standards for municipal and industrial wastewater discharges. The CWA made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained.

Section 303(d) of the CWA requires states, territories and authorized tribes to develop a list of water quality-impaired segments of waterways. The list includes waters that do not meet water quality standards for the 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 segments on the lists and develop action plans, called Total

Maximum Daily Loads (TMDLs), to improve water quality. Many water bodies in the Monterey Plus EIR area of analysis are listed as water quality limited (impaired) for one or more of the constituents of concern. The lists of impaired water bodies are prepared every two years.

Safe Drinking Water Act

The federal Safe Drinking Water Act (SDWA), enacted in 1974, and significantly amended in 1986, was established to protect the public health and quality of drinking water in the United States. The law addresses all waters actually or potentially designated for drinking use, whether from above ground or underground sources. The SDWA directed the EPA to set national standards for drinking water quality.

It required the EPA to set maximum contaminant levels (MCLs) for a wide variety of potential drinking water pollutants. The owners or operators of public water systems are required to comply with primary (health-related) MCLs and encouraged to comply with secondary (nuisance- or aesthetics-related) MCLs. The 1986 amendments to the SDWA directed the EPA to expand its list of MCLs.

SDWA drinking water standards apply to treated water as it is served to consumers. All surface waters require some form of treatment in order to meet drinking water standards. The degree of treatment needed depends on the quality of the raw water. The highest quality raw surface waters need only to be disinfected before being served to consumers. More typically, raw water is treated in a conventional water treatment plant that includes sedimentation, filtration and disinfection processes. Although it is technically possible to treat virtually any raw water so that it will meet drinking water standards, it is usually not practical to do so. Municipal water suppliers prefer raw water sources of high quality because their use minimizes risk to public health and the cost and complexity of treatment needed to meet SDWA drinking water standards.

Elevated total dissolved solids or chloride concentrations in drinking water can adversely affect its taste. Secondary MCLs for total dissolved solids and chloride are 500 mg/L and 250 mg/L respectively.¹² Bromide and total organic carbon concentrations are of concern because bromides and organic compounds react with disinfecting agents to form various chemical compounds that can harm human health at low concentrations. These compounds are referred to as disinfection byproducts and include trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform), haloacetic acids (mono-, di-, and trichloroacetic acid, mono- and dibromoacetic acid), chlorite and bromate. The primary MCLs for total trihalomethanes, total haloacetic acids, chlorite and bromate are 0.08, 0.06, 1 and 0.01 mg/L, respectively.¹³ Elevated total organic carbon concentrations can also affect the taste and odor of treated water.

Porter-Cologne Act

Responding to public concern in California, state legislators enacted a law designed to curb water pollution several years before passage of the Federal Water Pollution Control Act Amendments. The Porter-Cologne Act of 1969 established regional water quality control boards and gave them defined responsibilities for water quality management.

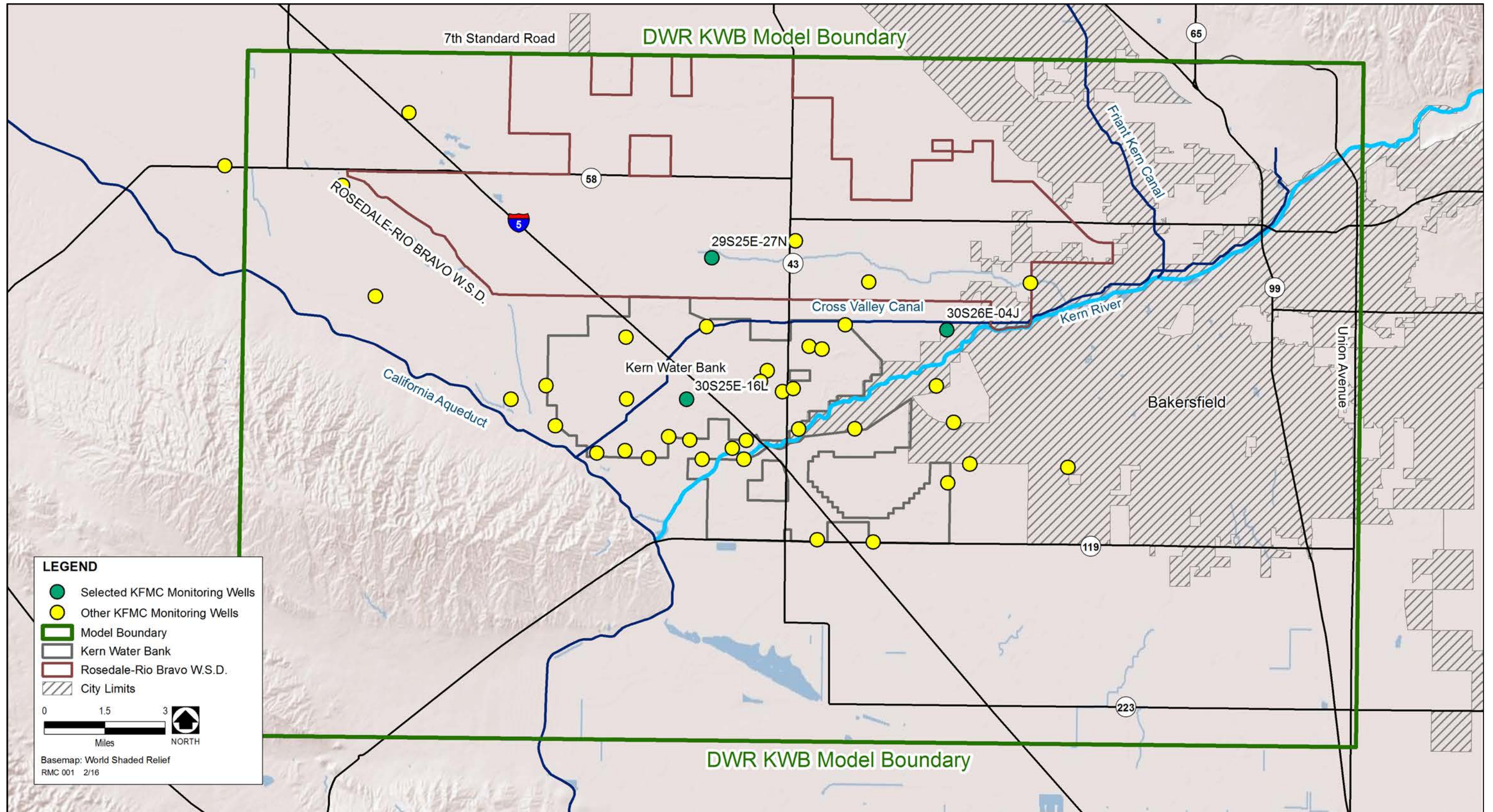


FIGURE 7.1-11. Location of Selected Kern Fan Monitoring Committee Monitoring Wells

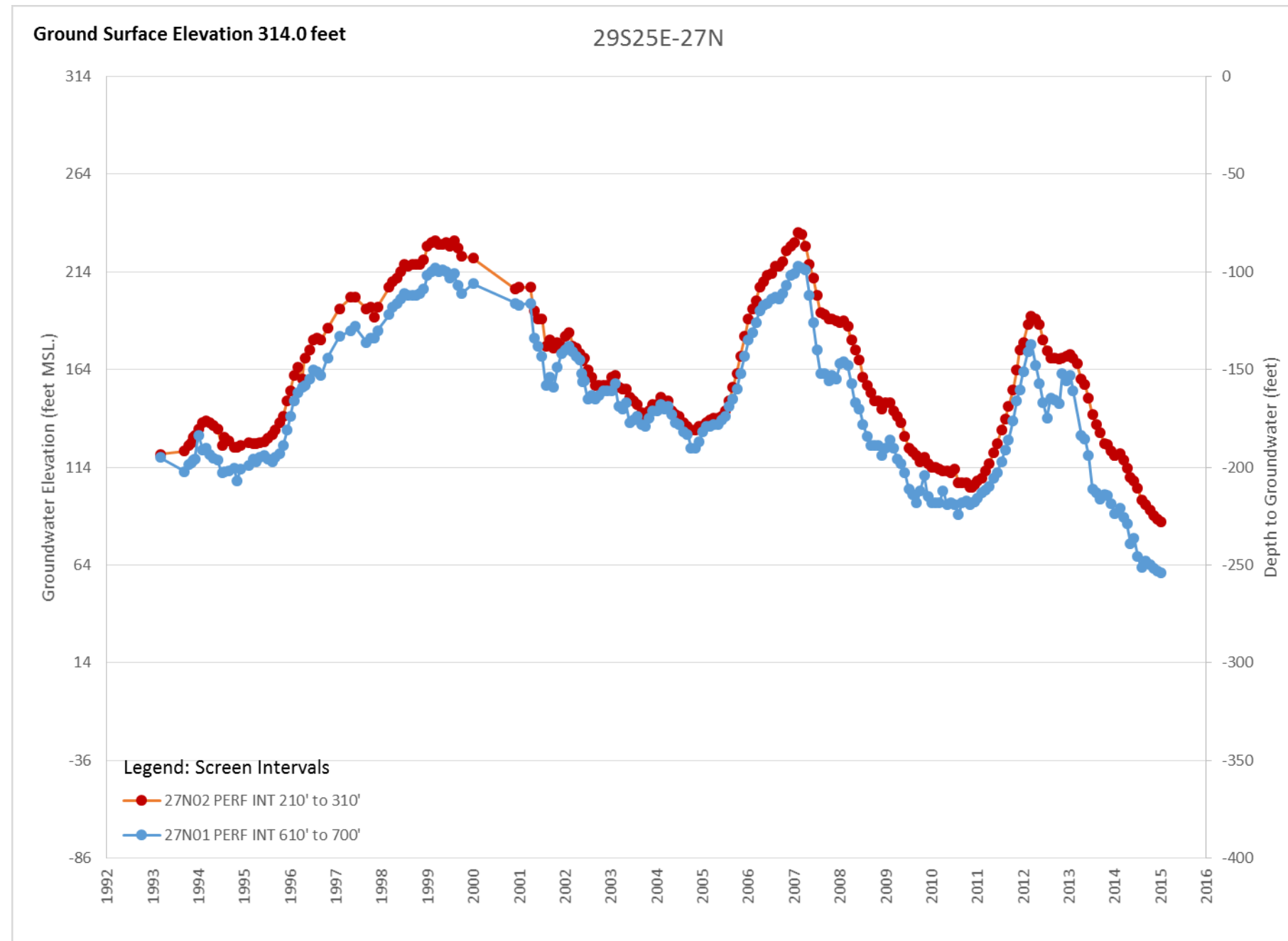


FIGURE 7.1-12. Groundwater Elevation Hydrograph at Multi-Completion Monitoring Well 27N North of the Kern Water Bank in Rosedale-Rio Bravo Water Storage District, 1993–2015

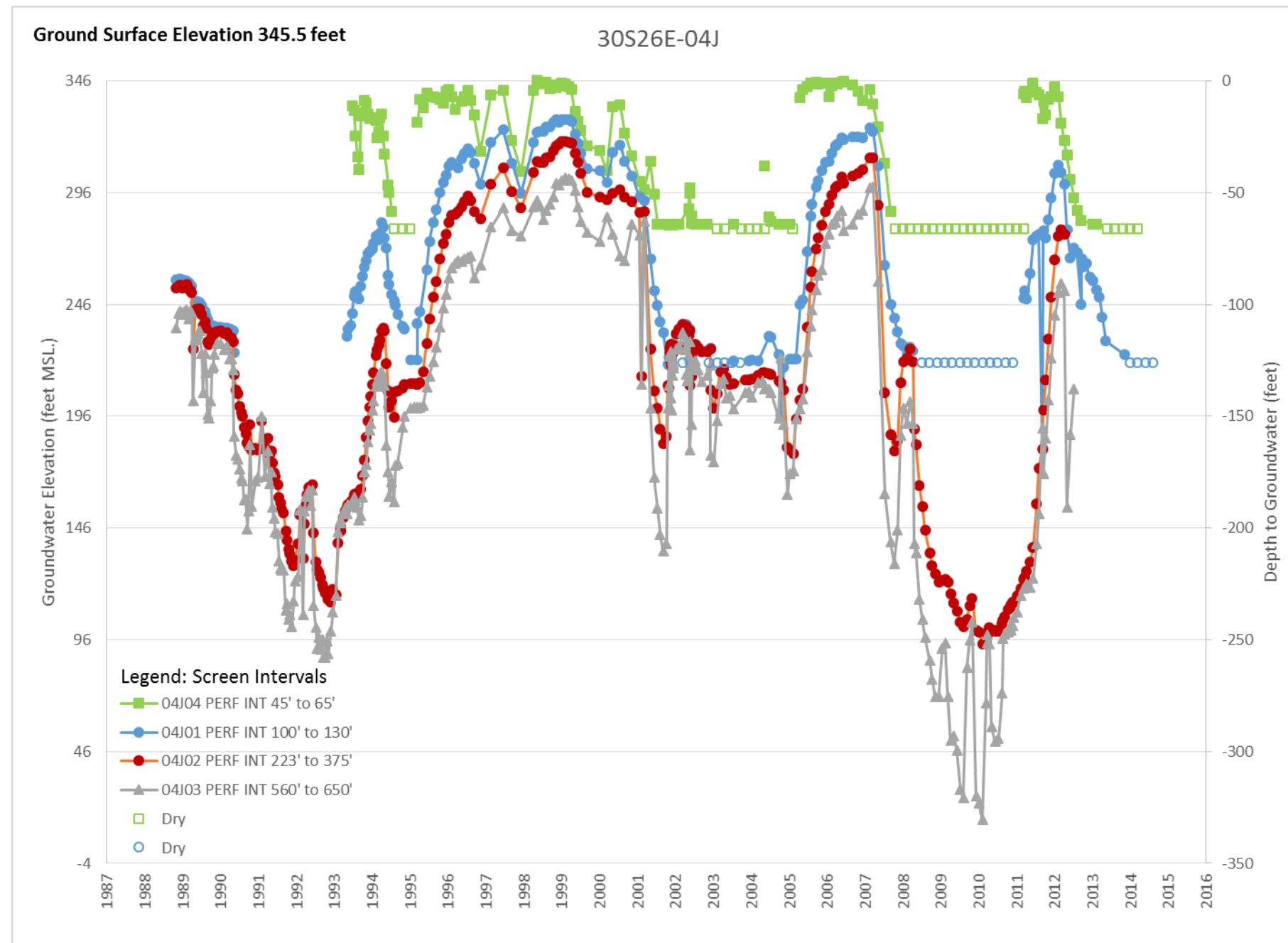


FIGURE 7.1-13. Groundwater Elevation Hydrograph at Multi-Completion Monitoring Well 04J Northeast of the Kern Water Bank in 2800 Acres, 1988–2015

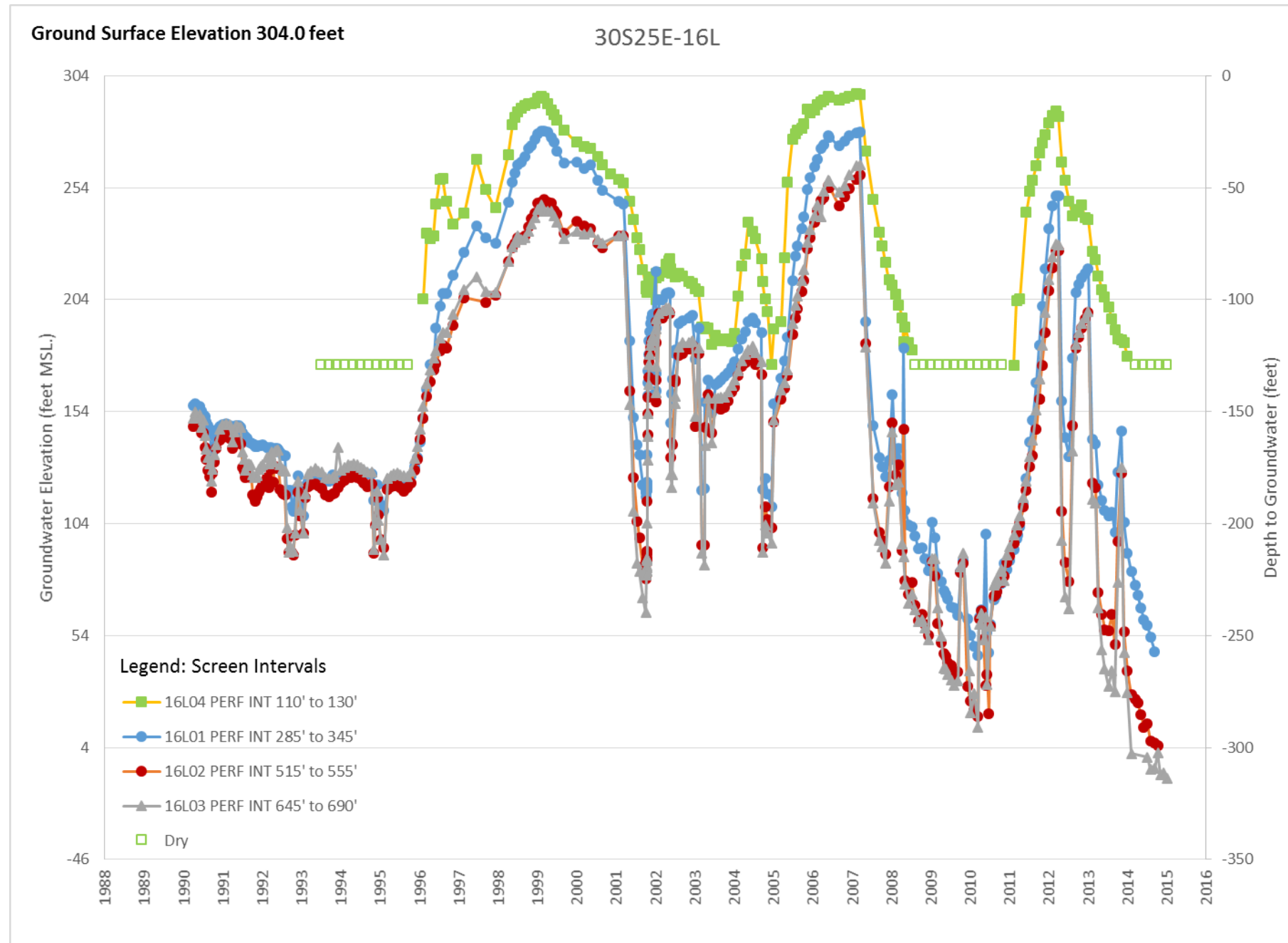


FIGURE 7.1-14. Groundwater Elevation Hydrograph at Multi-Completion Monitoring Well 16L within the Kern Water Bank, 1990–2015

The Porter-Cologne Act requires the regional water quality control boards to prepare regional water quality control plans (WQCPs), often referred to as basin plans. The WQCPs must identify present and future beneficial uses of California's waters and establish water quality objectives that will protect those uses. California's beneficial use designations and water quality objectives are the functional equivalent of the federal ambient water quality standards. After passage of the Federal Water Pollution Control Act Amendments, California's water quality objectives served as federal water quality standards, upon review and approval by the EPA.

WQCPs are adopted and amended by the regional water quality control boards but do not become effective until adopted by the State Water Resources Control Board (SWRCB). All WQCPs are subject to CEQA review. Adoption or revision of surface water objective/standards is subject to the approval of the EPA. The regional WQCPs complement statewide WQCPs adopted by the SWRCB.

Several WQCPs govern management of surface and ground waters that could be affected by KWB activities. The Tulare Lake WQCP covers the watershed in the southern San Joaquin Valley that drains to the Tulare Lake bed, including the Kings, Kaweah, Tule and Kern rivers. Each WQCP identifies existing and potential beneficial uses of surface waters and establishes water quality objectives within its part of California. Surface waters in the Tulare Lake WQCP area are in compliance with objectives.

7.1.2.4 Changes in Regulatory Setting between 1996 and 2014

California Statewide Groundwater Elevation Monitoring - 2009

California Statewide Groundwater Elevation Monitoring (CASGEM) was authorized by SBX7 6 and was enacted in November 2009. CASGEM mandates a statewide groundwater elevation monitoring program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. This requires collaboration between local monitoring entities and the Department to collect groundwater elevation data. As part of the CASGEM program, monitoring entities are designated to conduct or coordinate the monitoring of groundwater elevations for a basin or subbasin. The monitoring entities that monitor parts of Kern County subbasin 5-22.14 in Kern County are the KCWA Improvement District No. 4, the Kern River Fan Group, and the Semitropic Water Storage District.

Sustainable Groundwater Management Act - 2014

The 2014 Sustainable Groundwater Management Act (SGMA) went into effect on January 1, 2015. It established a new structure for managing groundwater in California. SGMA requires development of projects and programs to achieve long-term basin sustainability and includes: a) formation of groundwater sustainability agencies (GSAs) for all basins designated as high or medium priority by the Department; b) development of a groundwater sustainability plan (GSP); and c) implementation of the GSP to avoid "undesirable result" (California Water Code Section 10721(x)).

The Kern County subbasin (No. 5-22.14) has been designated a high priority basin by the Department. This means local agencies in this subbasin are required to form GSAs by June 2017, and to develop and adopt their GSPs by January 2020. Each GSP needs to include measurable goals and objectives, and implementation actions to achieve/maintain basin sustainability. The subbasin needs to be under sustainable management by 2040, by implementing monitoring, project implementation, and administrative actions.

7.1.3 IMPACTS AND MITIGATION MEASURES

As discussed in Section 7.1.1.2, three modeling scenarios (APO, AFO-EC, and AFO-BC) were used to evaluate potential impacts of KWB activities by comparing the results of DWR KWB Model runs both

“With KWB Operations” and “Without KWB Operations.” For this impact analysis, KWB operations include recharge, recovery, and conveyance of water to KWB participants, and are a subset of KWB activities, which includes the development and continued use and operations of the KFE property, including facility construction and maintenance.

7.1-1 KWB Operations could potentially deplete groundwater supplies so that a net deficit in aquifer volume of stored groundwater would occur.

1995 – 2014 (Analysis of Past Operations)

During the 1995–2014 operation period, KWB recharged surface water into the underlying aquifer in relatively wet years and recovered stored groundwater in relatively dry years.

The volume of water recharged into the aquifer during 1995–2014 at the KWB facilities was 2,006,372 AF. In comparison, the volume of water recovered from KWB during the same period was 1,389,113 AF. This resulted in 617,258 AF of water stored in the aquifer through KWB operations during 1995–2014. The annual recharge, recovery, and cumulative net recharge for the APO scenario are shown in Figure 7.1-15.

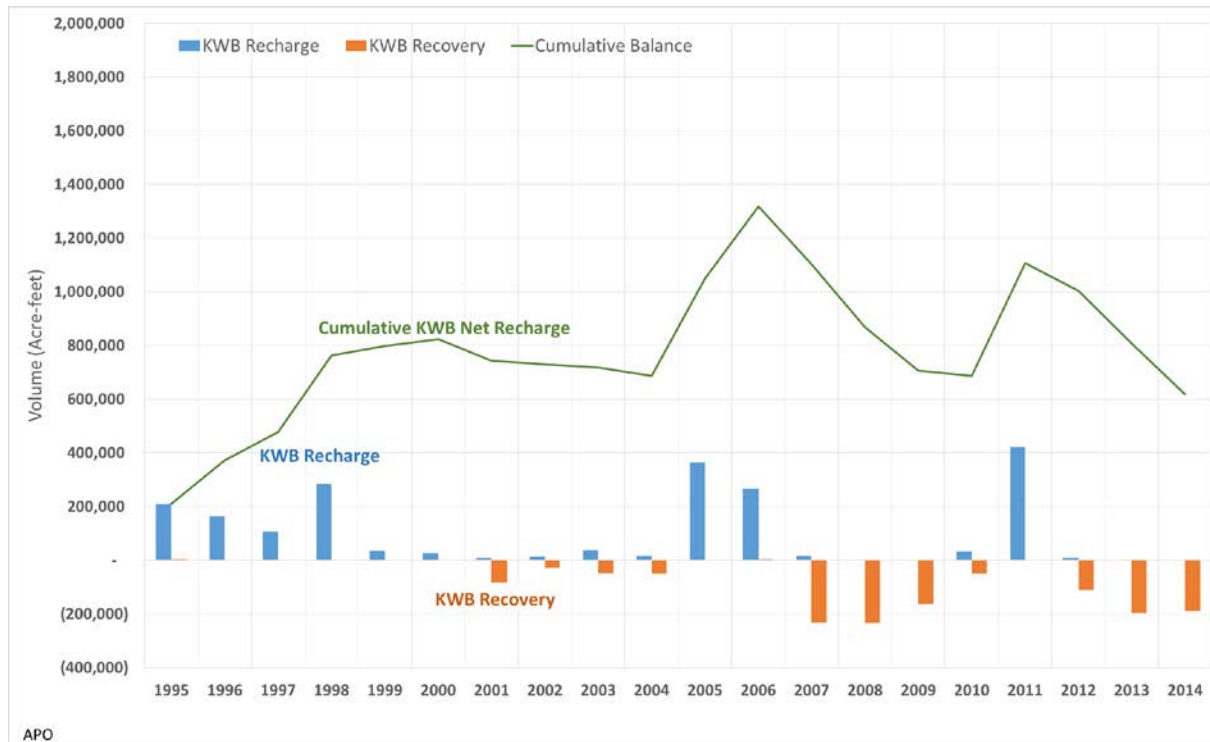


FIGURE 7.1-15. APO: Historical (1995–2014) Kern Water Bank Modeled Recharge, Recovery, and Cumulative Net Recharge

The information provided above shows that the historical use and operation of the KWB did not deplete groundwater supplies to cause a net deficit in aquifer volume of stored water; rather, KWB use and operation resulted in about 617,000 AF of stored water into the aquifer at the end of the 1995–2014 KWB operations.

Therefore, the impact of KWB operations from 1996 to 2014 on groundwater supplies, such that a net deficit in aquifer volume of stored groundwater would occur, was ***less than significant***.

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations—Existing Conditions)

During the 21 years (2015–2035) of future modeled operations under the existing (2015) level of land use development, the total volume of water recharged at the KWB facilities would be 2,112,325 AF. This amount is slightly higher than the total recharge volume during the historical 1995–2014 period because increased recharge pond areas would allow KWB to recharge an additional amount of water compared to that available under a hydrologic condition similar to the 1995–2014 period. In comparison, the total volume of water that would be recovered from KWB during the same 2015–2035 period would be 1,546,368 AF, which also would be higher than the 1995-2014 amount because of an additional year of pumping in 2015. The net impact of KWB activities under AFO-EC would be the introduction of an additional 565,957 AF of stored water into the aquifer during 2015–2035. The annual recharge, recovery, and cumulative net recharge for AFO-EC scenario are shown in Figure 7.1-16.

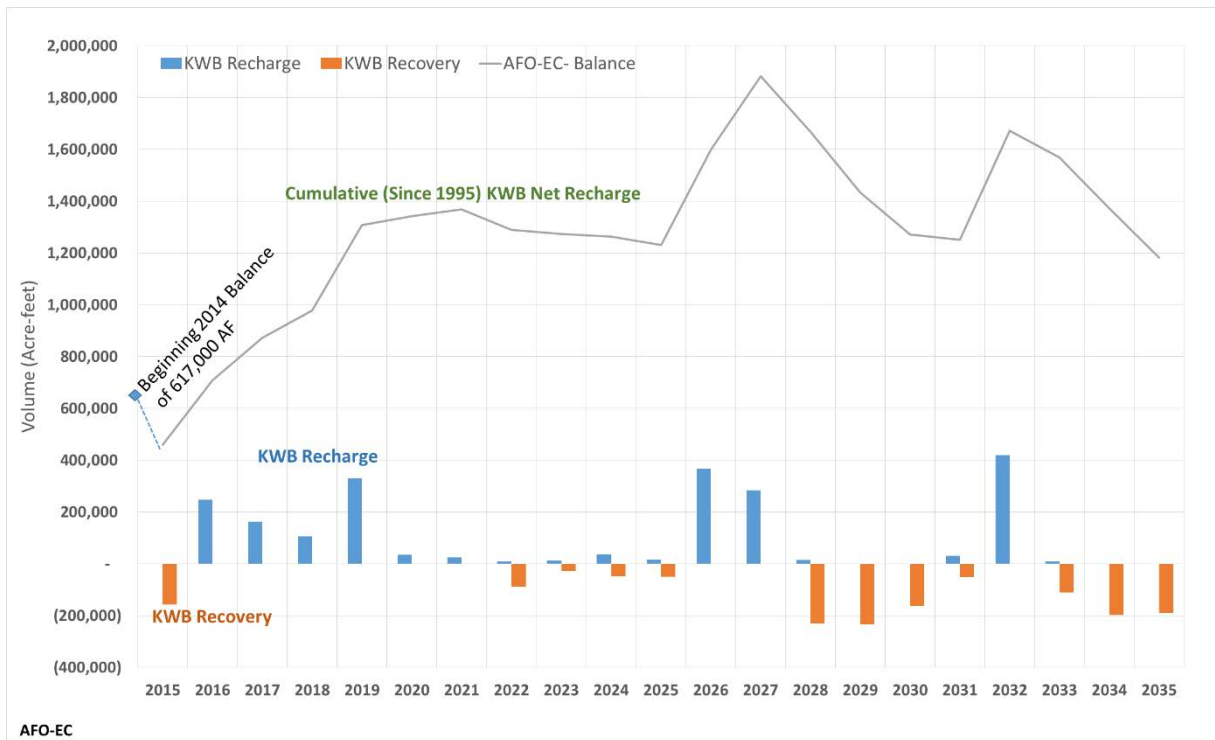


FIGURE 7.1-16. AFO-EC: Kern Water Bank Modeled Recharge, Recovery, and Cumulative Net Recharge, 2015-2035

At the end of 1995–2014 historical KWB operations, an accumulated balance of 617,258 AF of stored water existed from past KWB activities. When this prior balance is added to the additional water stored during the 2015–2035 period, there is a balance of 1,183,215 AF of stored water at the end of 2035 under the AFO-EC scenario, assuming a repeat of hydrology similar to the 1995-2014 period.

The information provided above shows that future KWB activities under existing conditions would not deplete groundwater supplies to cause a net deficit in aquifer volume of stored water; rather, KWB activities would add about 566,000 AF of water into storage during future operations from 2015 through 2035, under the existing level of development.

Therefore, the impact of KWB future operations under existing conditions from 2015 to 2035 on groundwater supplies, such that a net deficit in aquifer volume of stored groundwater would occur, would be **less than significant**.

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations—Build-out Conditions)

During the 21 years (2015–2035) of future modeled operations under the build-out (2030) level of land use development, the total volume of water recharged at the KWB would be 2,112,325 AF. This amount is higher than the total recharge volume during the APO but is equal to the total recharge volume of the AFO-EC scenario. Although there is an increase in recharge pond areas under build-out conditions compared to existing conditions, the total recharge volume remained the same because of availability of recharge water and the capacity of aquifer to store the water without causing surface flooding. In comparison, the total volume of water recovered from KWB during the same 2015–2035 period would be 1,614,236 AF. This would be higher than the APO scenario because of one additional year of pumping in 2015 and increased pumping capacity made available from new recovery wells and recharge ponds. The net impact of KWB activities under AFO-BC would be the introduction of an additional 498,090 AF of stored water into the aquifer during 2015–2035. Annual recharge, recovery, and cumulative net recharge for the AFO-BC scenario are shown in Figure 7.1-17.

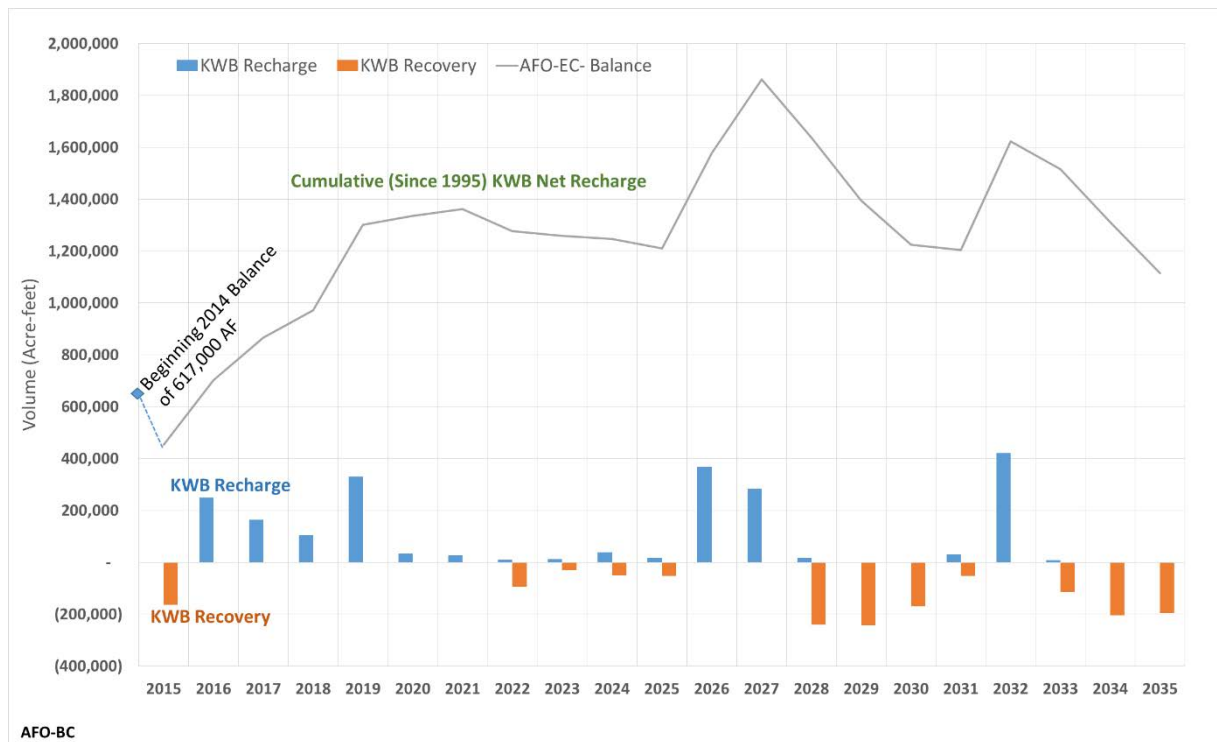


FIGURE 7.1-17. AFO-BC: Kern Water Bank Modeled Recharge, Recovery, and Cumulative Net Recharge, 2015-2035

At the end of the 1995–2014 historical KWB modeled operations, an accumulated balance of about 617,000 AF of stored water existed from past KWB activities. When this prior balance is added to the additional water stored during the 2015–2035 period, there is a balance of 1,115,348 AF of stored

water at the end of 2035 under the AFO-BC scenario, assuming a repeat of hydrology similar to the 1995-2014 period.

The information provided above shows that future KWB activities under build-out conditions would not deplete groundwater supplies to cause a net deficit in aquifer volume of stored water; rather, KWB activities would add about 498,000 AF of water into storage during future operations from 2015 through 2035, under build-out conditions.

Therefore, the impact of KWB future operations under build-out conditions from 2015 to 2035 on groundwater supplies, such that a net deficit in aquifer volume of stored groundwater would occur, would be ***less than significant***.

Mitigation Measures

None required.

7.1-2 KWB operations could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

Evaluation Method

Impacts of KWB activities on the local groundwater table within the DWR KWB Model domain were evaluated by comparing simulated groundwater elevations of the “With KWB Operations” model run with those from the “Without KWB Operations” model run.

At each monthly interval in the model simulation, the simulated groundwater elevation at every model cell for the “Without KWB Operations” model run was subtracted from the simulated groundwater elevation at the corresponding cell for the “With KWB Operations” model run. For the purpose of the current evaluation, all differences within ± 5 feet were ignored because they were likely within the range of uncertainty in model results. Uncertainty exists for all models and, in the case of the DWR KWB Model, it arises due to many factors including a simplified representation of aquifer complexity and assumptions about stresses (e.g., calculated agricultural pumping).

KWBA and Rosedale agreed, pending the completion of the REIR, to an Interim Project Operations Plan (Interim Operations Plan) for the KWB and Rosedale water banks (see Appendix 7-5b) which establishes triggers and actions for mitigation using the following two-tier approach:

- The average water level at seven index wells, measured on March 31 of each year, must be more than 140 feet from the surface (i.e., average depth to water at these wells must exceed 140 feet on March 31).
- After the above condition is met, a negative project impact (NPI) would be said to occur when the model simulated groundwater elevation (i.e., projected groundwater elevation) at an operative well for “with project” (with both KWB and Rosedale projects) conditions is 45 feet lower than that of the “without project” (without both KWB and Rosedale projects) conditions.

As of early 2016, KWBA has been working on a Long-Term Operations Plan that uses the same two-tier approach but proposes to lower the mitigation threshold to 30 feet, because the 45-foot NPI defined above includes impacts from both the KWB and the Rosedale groundwater banking projects, rather than the KWB in isolation.

Based on the above information and in consideration of local agreements regarding mitigation thresholds, the model-generated groundwater elevation differences of more than -30 feet (“with KWB activities” minus “without KWB activities”) at any time during the DWR KWB Model simulation period were analyzed to evaluate whether the impacts on the local groundwater table would be potentially significant.

1995 – 2014 (Analysis of Past Operations)

Impacts of past (1995–2014) KWB operations on the local groundwater table were evaluated by comparing simulated groundwater elevations from the “With KWB Operations” model run with those from the “Without KWB Operations” model run.

Figure 7.1-18 shows lines of groundwater differences that indicate the extent of the lowering of the local water table due to KWB activities. The line labeled as “-30” feet shows the outermost edge of model cells where water levels were lowered by more than 30 feet due to KWB activities at least in one time step (month) during the 1995–2014 model simulation period. Figure 7.1-18 shows that lowering of the water table of more than 30 feet has occurred between KWB’s northern boundary and Rosedale’s southern boundary.

KWB operations under the APO scenario result in lowering the water table up to 55 feet outside of KWB Lands. Figure 7.1-19 shows the location of wells that lie in areas outside of KWB Lands, where lowering of the water table exceeds 30 feet. Table 7.1-5 lists the range of maximum drawdowns at these wells located outside of KWB Lands.

APO RESULTS: MAXIMUM DRAWDOWN IN EXISTING WELLS OUTSIDE KWB BOUNDARY	
Well Locations	Range of Maximum Drawdown* Simulated in Existing Wells
North of KWB Boundary	30 feet to 43 feet
East of KWB Boundary	30 feet to 32 feet
Southeast of KWB Boundary (2800 Acres and Improvement District No. 4 area)	32 feet to 40 feet
Southwest of KWB Boundary (West Kern Water District)	33 feet to 46 feet

**These drawdowns reflect maximum drawdown simulated in existing wells. Maximum drawdown anywhere outside KWB is 55 feet, which occurs in a location where there are no existing wells. See Figure 7.1-19.*

Impacts of past KWB activities on the local groundwater table were also evaluated by comparing modeled groundwater elevations with historical data and well characteristics. Modeled depth to water at well (30S25E-02L02 SREX-06) nearest to the KWB boundary on the north is shown in Figure 7.1-20 for both “With KWB Operations” and “Without KWB Operations” model runs under the APO scenario. The modeled groundwater elevation of this well decreases by 220 feet from 2007 through 2009. Historical groundwater fluctuations in the KWB area have been measured of up to 246 feet. Therefore, the model-predicted drawdowns associated with KWB activities are within these recorded fluctuations. During KWB recovery periods, an additional drawdown between 30 to 46 feet may have no adverse effects on pre-existing nearby wells and their ability to produce water to support existing or planned land uses.

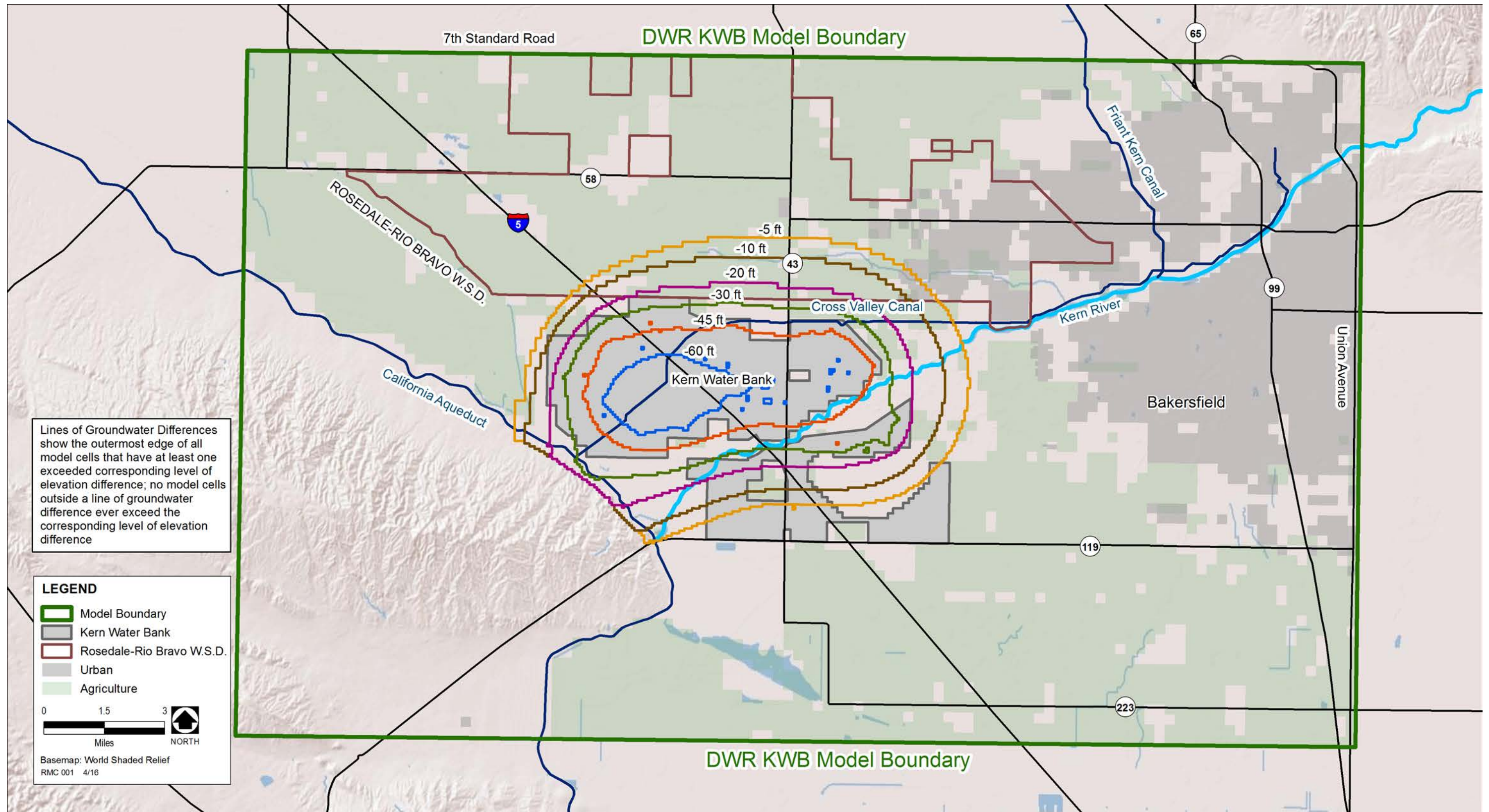


FIGURE 7.1-18. APO: Contours of Maximum Extent of Negative Differences (“With” minus “Without” KWB Operations), 1995–2014

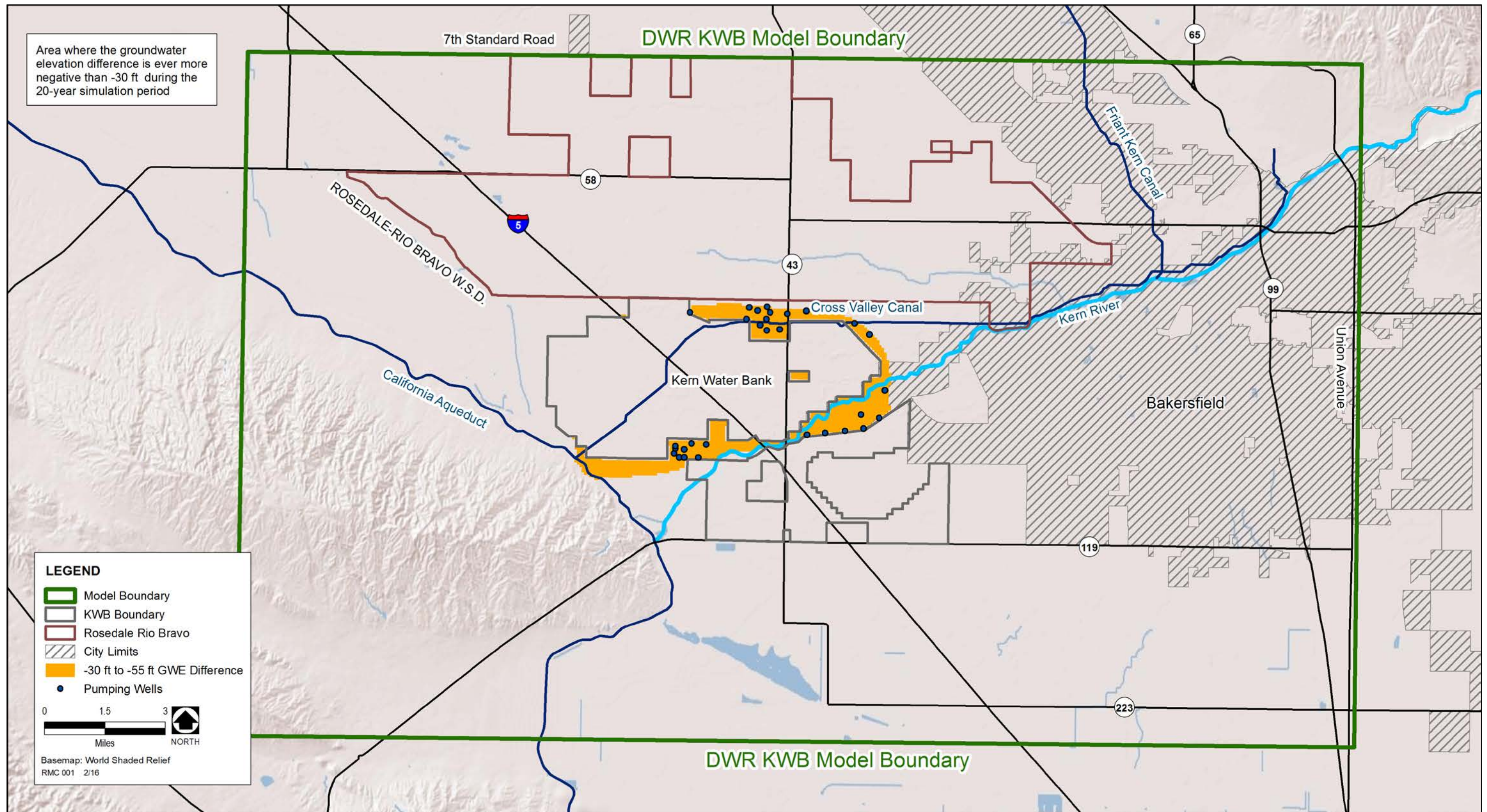


FIGURE 7.1-19. APO: Location of DWR KWB Model Wells in Areas with Groundwater Elevation Difference between -30 feet and -55 feet (“With KWB Operations” minus “Without KWB Operations”), 1995–2014 (These drawdowns reflect maximum drawdown simulated anywhere outside KWB. Maximum drawdown at any well is 46 feet. See Table 7.1-5.)

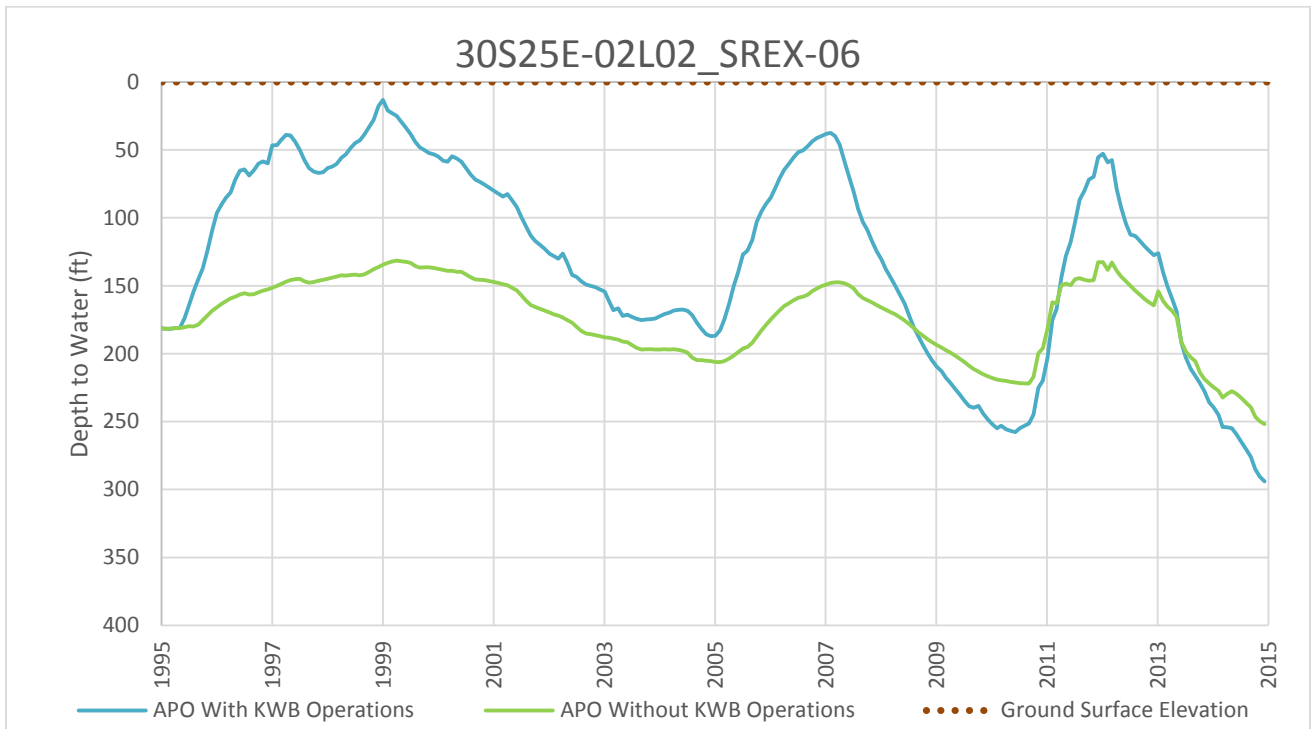


FIGURE 7.1-20. APO: Model Simulated Depth to Water at Production Well 30S25E-02L02 SREX-06

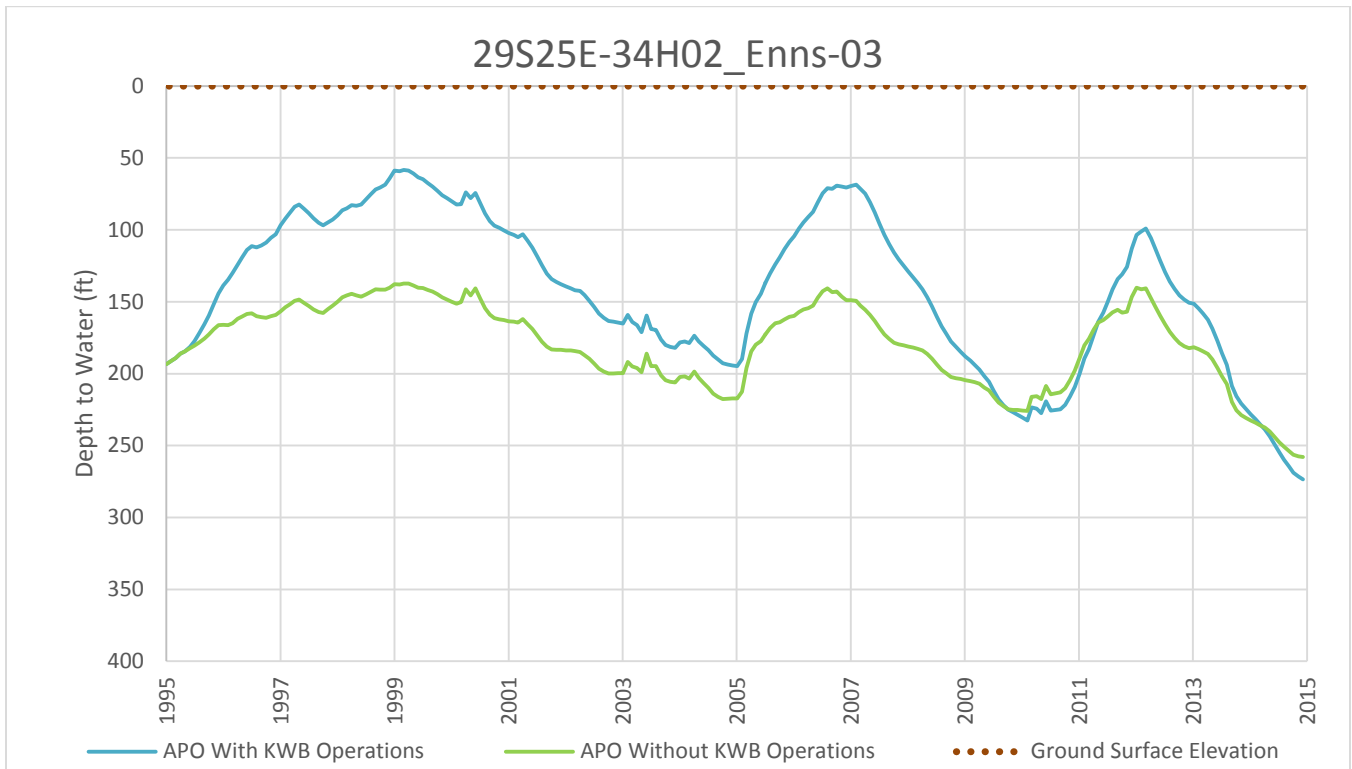


FIGURE 7.1-21. APO: Model Simulated Depth to Water at Production Well 29S25E-34H02 Enns-03

Most private wells are perforated up to approximately 400 feet below ground surface (bgs) and produce water at rates that meet domestic water use requirements. KWB activities lower groundwater levels to approximately 260 feet bgs at the end of the 2007-2009 recovery period and to approximately 300 feet bgs at the end of the 2012-2014 recovery period. This would leave approximately 100 feet of screened well below water, which would provide adequate flow to support operation at sufficient production rates for private wells. Therefore KWB operations are not expected to have a significant effect on operation of neighboring private landowner wells under historical low groundwater conditions except on those wells that are perforated to a depth less than 300 feet bgs.

Most production wells operated by neighboring water districts have screens that are perforated in the deep aquifer up to approximately 700 feet bgs. For example, two Rosedale production wells that are in the immediate vicinity of the northern KWB boundary have the following screen intervals: 177 to 417 feet bgs (29S25E-34H02 Enns-03) and 457 to 737 feet bgs (29S25E-34H01 Enns-02). The DWR KWB Model predicted that at the shallower Rosedale production well, low water table conditions during 1995-2014 without KWB activities was about 258 feet bgs and with KWB activities was about 274 feet bgs (Figure 7.1-21). This groundwater level is higher than the production well depths of both deeper and shallower Rosedale wells.

Whether KWBA's operations caused an impact that actually was significant at a specific agricultural or domestic well would depend on several factors, such as location of the well, depth of the well and operational depth of the pump, pump efficiency, and pumping rate. Because all of this information for each well is not known, the specific potential impacts of KWB activities with respect to lowering of the local groundwater table at specific wells could not be determined through modeling alone.

However, as described in Revised Appendix E, KWBA and Rosedale developed and implemented an Interim Operations Plan in 2014 (see Appendix 7-5b). The Interim Operations Plan designates measures to be employed to "... prevent, eliminate or mitigate significant adverse impacts" resulting from KWB and Rosedale project operations. Pioneer Project participants and Rosedale subsequently developed and have implemented a similar plan which employs similar measures to prevent, eliminate, or mitigate significant adverse impacts resulting from Pioneer Project and Rosedale project operations.

Each plan requires the formation of a Joint Operations Committee (JOC) that oversees the implementation of the plan, including the establishment of a process to respond to and evaluate landowner claims associated with project operations including claims made prior to the Interim Plan. The two separate JOCs have established a process whereby landowner claims are responded to and evaluated at joint meetings and in an otherwise coordinated manner (hereinafter referred to, collectively, as the "JOC").

At the onset of implementation of the plans, the JOC sent letters to those who in 2010 made claims of groundwater impacts to various local groundwater banks and landowners in areas of concern. The letters alerted them to the potential for groundwater level declines to affect their wells and that the groundwater bank participants may be able to provide funds to help alleviate those impacts. As of December 31, 2015, the JOC has evaluated and responded to claims filed before the Interim Plan and has received about 21 new claims from 2015. Of the pre-Interim Plan claims, 8 were processed for payment and 8 were rejected. Of the 2015 claims filed after the Interim Plan, 13 have been processed for payment, 6 have been rejected, and 3 are pending.

To date, the JOC has authorized payments totaling approximately \$447,800 as mitigation for the processed claims. These payments have been pro-rated based on the relative contribution of each of the projects toward an impact. The KWB share of these payments has been about 15%; the other projects' collective share (Rosedale and Pioneer) has been about 85%.

The payments have been used for the following improvements: providing a permanent connection to a municipal water supply, lowering pumps in existing wells, and drilling deeper wells. These improvements provide for a more reliable water supply during the current and future droughts, such that future impacts are less likely to occur because wells particularly vulnerable to declining groundwater levels have already been permanently mitigated. The JOC has also paid for and provided emergency water for domestic uses while evaluating claims, where needed.

Therefore, the impact of KWB operations from 1995 to 2014 depleted groundwater supplies and lowered the local groundwater table level (e.g., the production rate of pre-existing nearby wells would dropped to a level that would not support existing land uses or planned uses for which permits have been granted). KWBA, however, implemented measures and impacts were *less than significant*.

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations—Existing Conditions)

Potential impacts of future (2015–2035) KWB activities under existing conditions (2015 level of development) on the local groundwater table were evaluated by comparing simulated groundwater elevations from the “With KWB Operations” model run with those from the “Without KWB Operations” model run under AFO-EC scenario.

Figure 7.1-22 shows line of groundwater differences that indicate the extent of the lowering of local water table due to KWB activities. The line labeled as “-30 feet” show the outermost edge of model cells where water levels were lowered by more than 30 feet due to KWB activities at least in one time step (month) during the 2015-2035 model simulation period under existing conditions (2015 level of development). Figure 7.1-22 shows that lowering of the water table of more than 30 feet has occurred to agricultural land inside Rosedale’s southern boundary.

Figure 7.1-23 shows location of the wells that lie in areas outside of KWB Lands, where lowering of the water table is between 30 feet and 75 feet, due to KWB activities under the AFO-EC scenario. Table 7.1-6 lists the range of maximum drawdowns at those wells located outside of KWB Lands. Since no wells are located at the point of maximum drawdown outside KWB Lands, the greatest drawdown seen in an individual well is 66 feet.

Modeled depth to water (DWR KWB Model) at well (30S25E-02L02 SREX-06) nearest to the KWB boundary on the north is shown in Figure 7.1-24 for both “With KWB Operations” and “Without KWB Operations” model runs under AFO-EC scenario. Historical fluctuations in groundwater levels in the DWR KWB Model area have been measured up to 246 feet; therefore, these model-predicted drawdowns associated with KWB activities are well within normal fluctuations. During KWB recovery period, additional drawdown between 30 to 75 feet may have no adverse effects on pre-existing nearby wells and their ability to produce water to support existing or planned land uses.

Most private wells are perforated up to approximately 400 feet bgs and produce water at rates that meet domestic water use requirements. KWB activities lower groundwater levels to approximately 340 feet bgs at the end of the 2015 recovery period and to approximately 310 feet bgs at the end of the 2033-2035 recovery period. This would leave approximately 60 feet of screened well below the water level, which would provide adequate flow to support operation at sufficient production rates for private wells.

However, whether KWBA's operations would cause an impact that would be potentially significant at a specific agricultural or domestic well would depend on several factors, such as location of the well, depth of the well and operational depth of the pump, pump efficiency, and pumping rate. Because all of this information for each well is not known, the specific potential impacts of KWB activities with respect to lowering of the local groundwater table at specific wells could not be determined through modeling alone. Consequently, lowering of the local water table at sites in the vicinity of KWB could have adverse effects at individual wells.

Therefore, the impact of KWB future operations under existing conditions from 2015 to 2035 could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted). This impact would be ***potentially significant***.

2015 – 2035 (Analysis of Future Operations—Build-out Conditions)

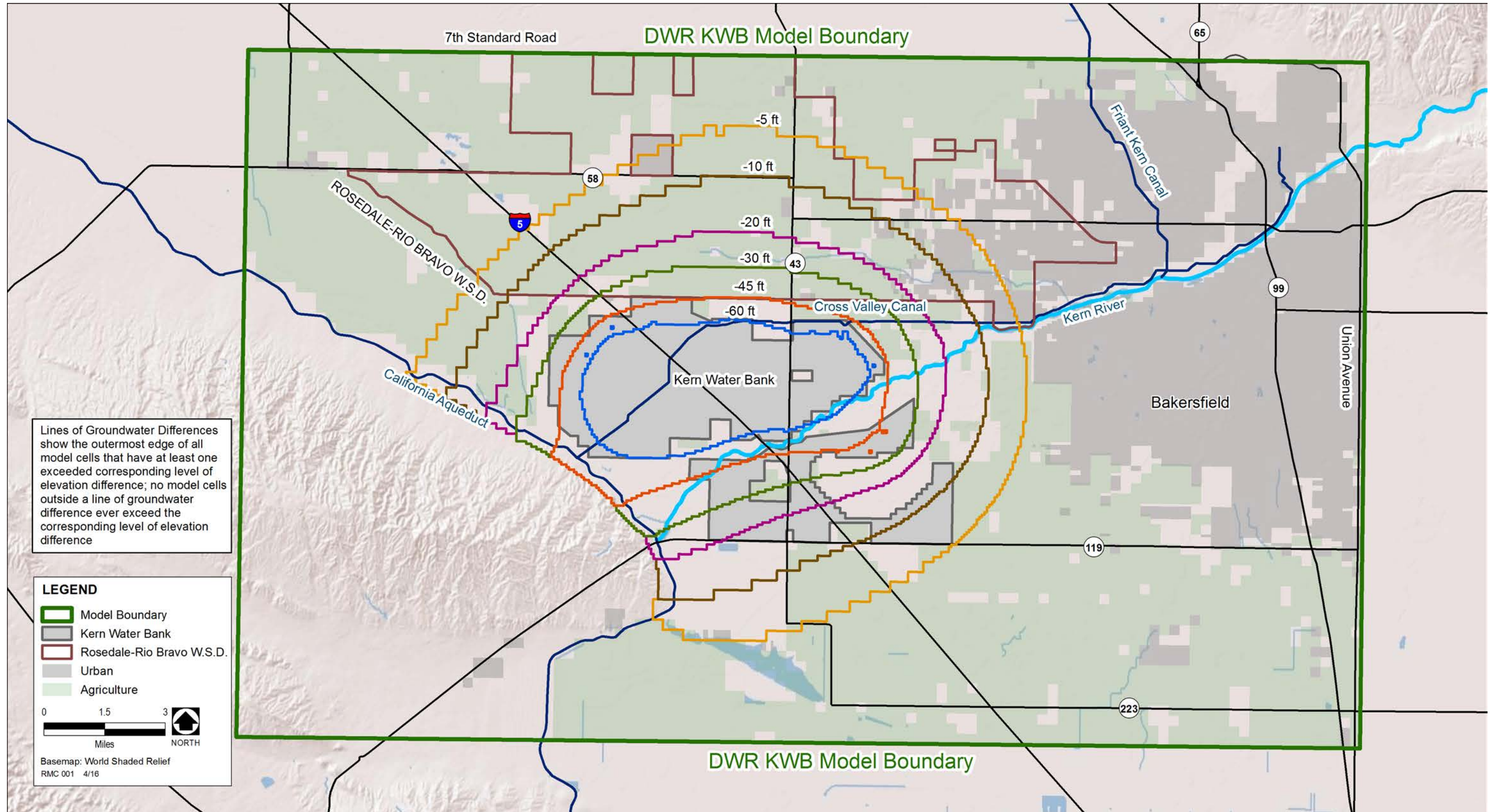
Potential impacts of future (2015–2035) KWB activities under build-out conditions (2030 level of development) on local groundwater table were evaluated by comparing simulated groundwater elevations of the “With KWB Operations” and “Without KWB Operations” model runs under AFO-BC scenario.

Figure 7.1-26 shows lines of groundwater differences that indicate extent of the lowering of local water table due to KWB activities. The line labeled as “-30 feet” show the outermost edge of model cells where water levels were lowered by more than 30 feet due to KWB activities at least in one time step (month) during the 2015-2035 model simulation period under build-out conditions (2030 level of development). Figure 7.1-26 shows that lowering of the water table of more than 30 feet has occurred in agricultural land inside Rosedale's southern boundary.

Figure 7.1-27 shows location of the wells that lie in areas outside of the KWB Lands, where lowering of the water table is between approximately 30 and 80 feet, due to KWB activities under AFO-BC scenario. Table 7.1-7 lists the range of maximum drawdowns at these wells located outside of the KWB Lands. Since no wells are located at the point of maximum drawdown outside KWB, the greatest drawdown seen in an individual well is 66 feet.

Modeled depth to water (DWR KWB Model) at well (30S25E-02L02 SREX-06) nearest to the KWB boundary on the north is shown in Figure 7.1-28 for both “With KWB Operations” and “Without KWB Operations” model runs under the AFO-BC scenario. The modeled groundwater elevation of this well decreases by 260 feet from 2028 through 2030. Historical groundwater fluctuations in the KWB area have been measured of up to 246 feet. Therefore, the model-predicted drawdowns associated with KWB activities are within these recorded fluctuations. During the KWB recovery period, an additional drawdown between approximately 30 to 80 feet may have no adverse effects on pre-existing nearby wells and their ability to produce water to support existing or planned land uses.

Most private wells are perforated up to approximately 400 feet bgs and produce water at rates that meet domestic water use requirements. KWB activities lower groundwater levels to approximately 360 feet bgs at the end of the 2015 recovery period and to approximately 340 feet bgs at the end of the 2033-2035 recovery period. This would leave approximately 40 feet of screened well below water, which would provide adequate flow to support operation at sufficient production rates for private wells.



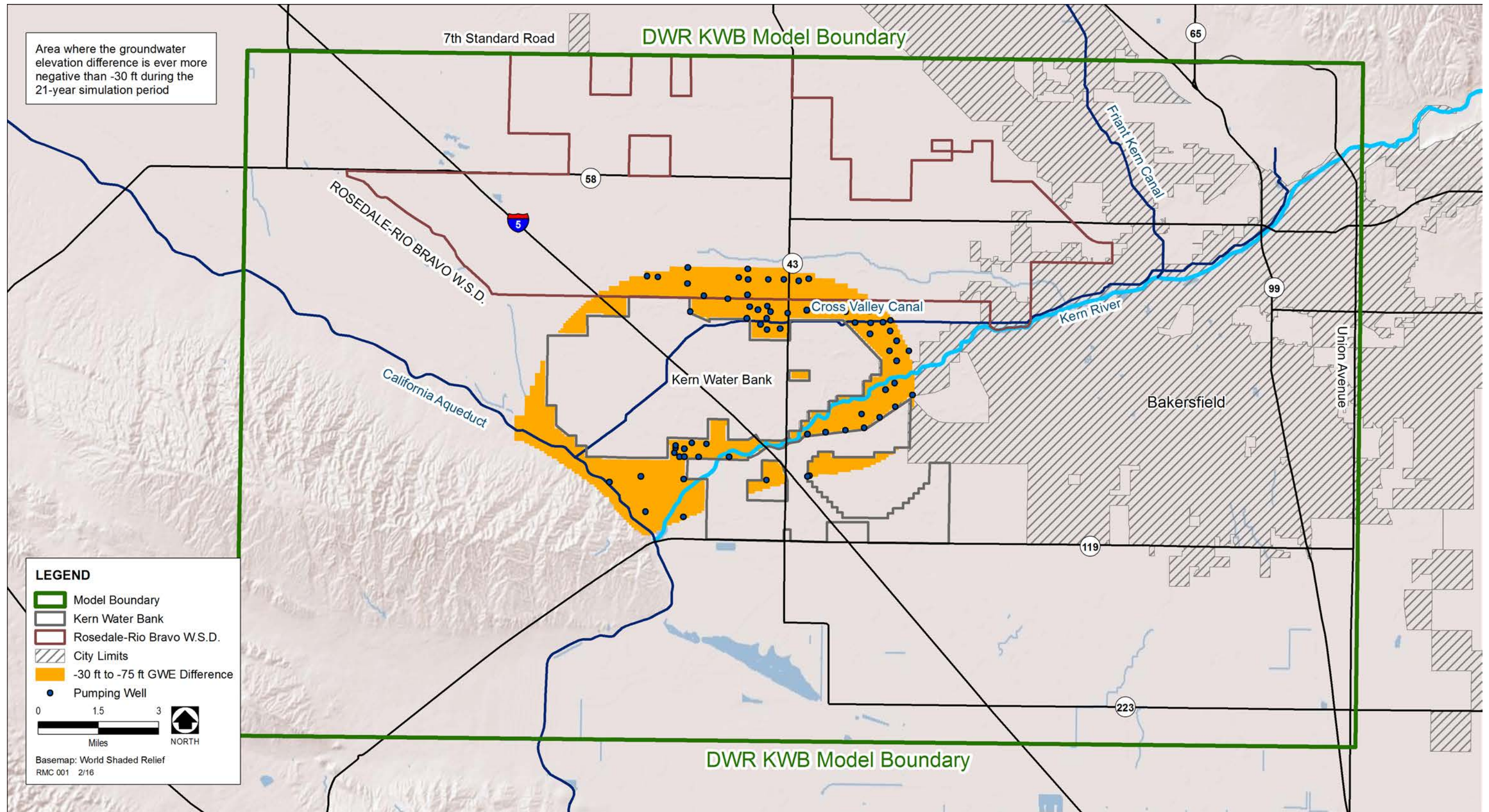


FIGURE 7.1-23. AFO-EC: Location of DWR KWB Model Wells in Areas with Groundwater Elevation Difference Between -30 feet and -75 feet (“With KWB Operations” minus “Without KWB Operations”), 2015–2035 (These drawdowns reflect maximum drawdown simulated anywhere outside KWB. Maximum drawdown at any well is 66 feet. See Table 7.1-6.)

AFO-EC RESULTS: MAXIMUM DRAWDOWN IN EXISTING WELLS OUTSIDE KWB BOUNDARY	
Well Locations	Range of Maximum Drawdown* Simulated in Existing Wells
North of KWB Boundary	30 feet to 63 feet
East of KWB Boundary	30 feet to 45 feet
Southeast of KWB Boundary (2800 Acres and Improvement District No. 4 area)	30 feet to 54 feet
Southwest of KWB Boundary (West Kern Water District)	33 feet to 66 feet

*These drawdowns reflect maximum drawdown simulated in existing wells. Maximum drawdown anywhere outside KWB is 75 feet, which occurs in a location where there are no existing wells. See Figure 7.1-23.

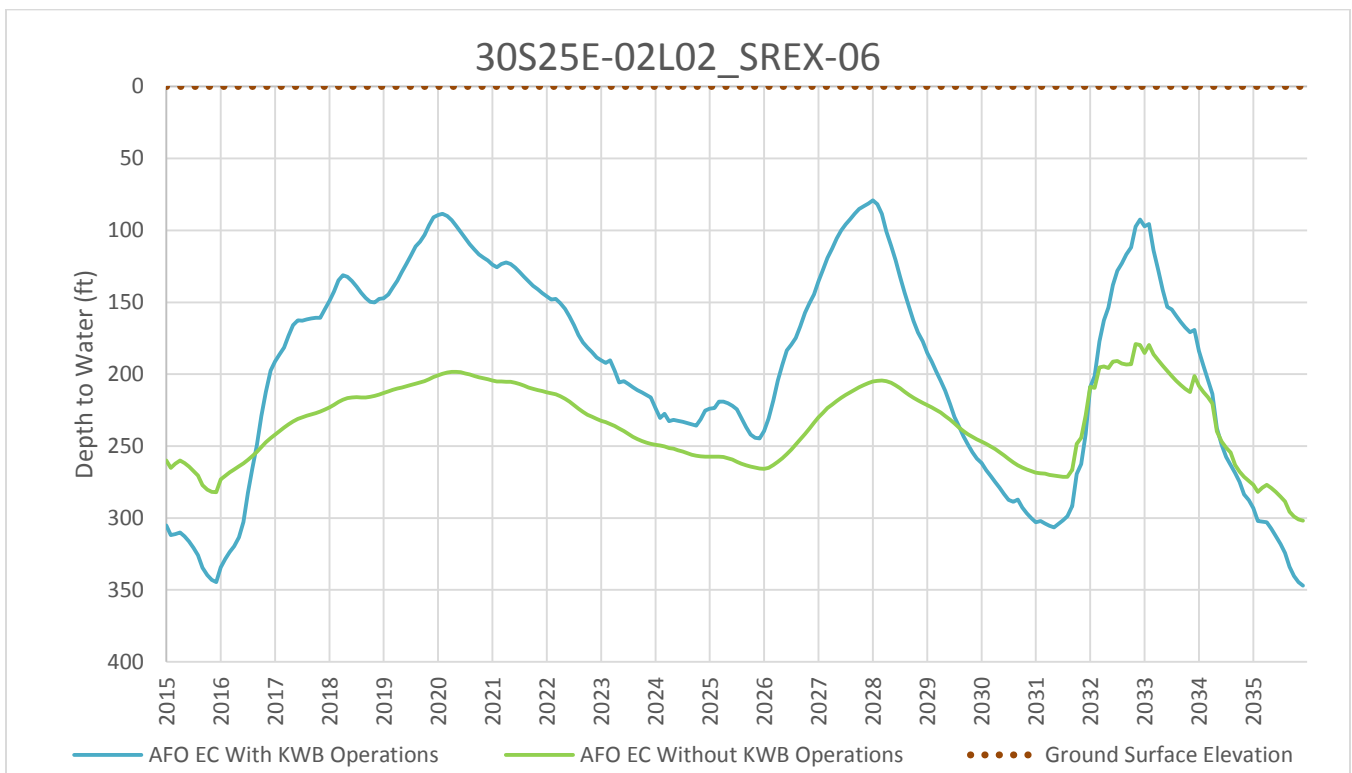


FIGURE 7.1-24. AFO EC: Model Simulated Depth to Water at Production Well 30S25E-02L02 SREX-06

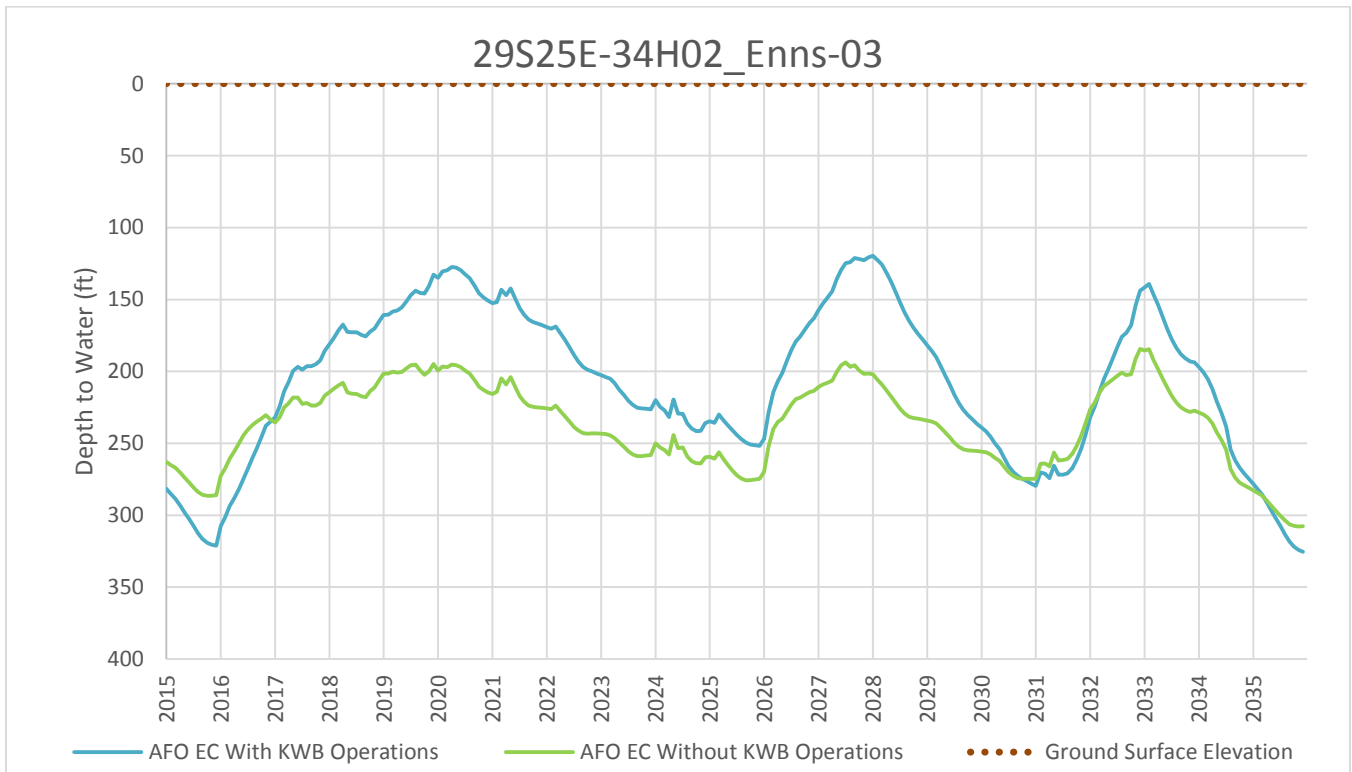


FIGURE 7.1-25. AFO EC: Model Simulated Depth to Water at Production Well 29S25E-34H02 Enns-03

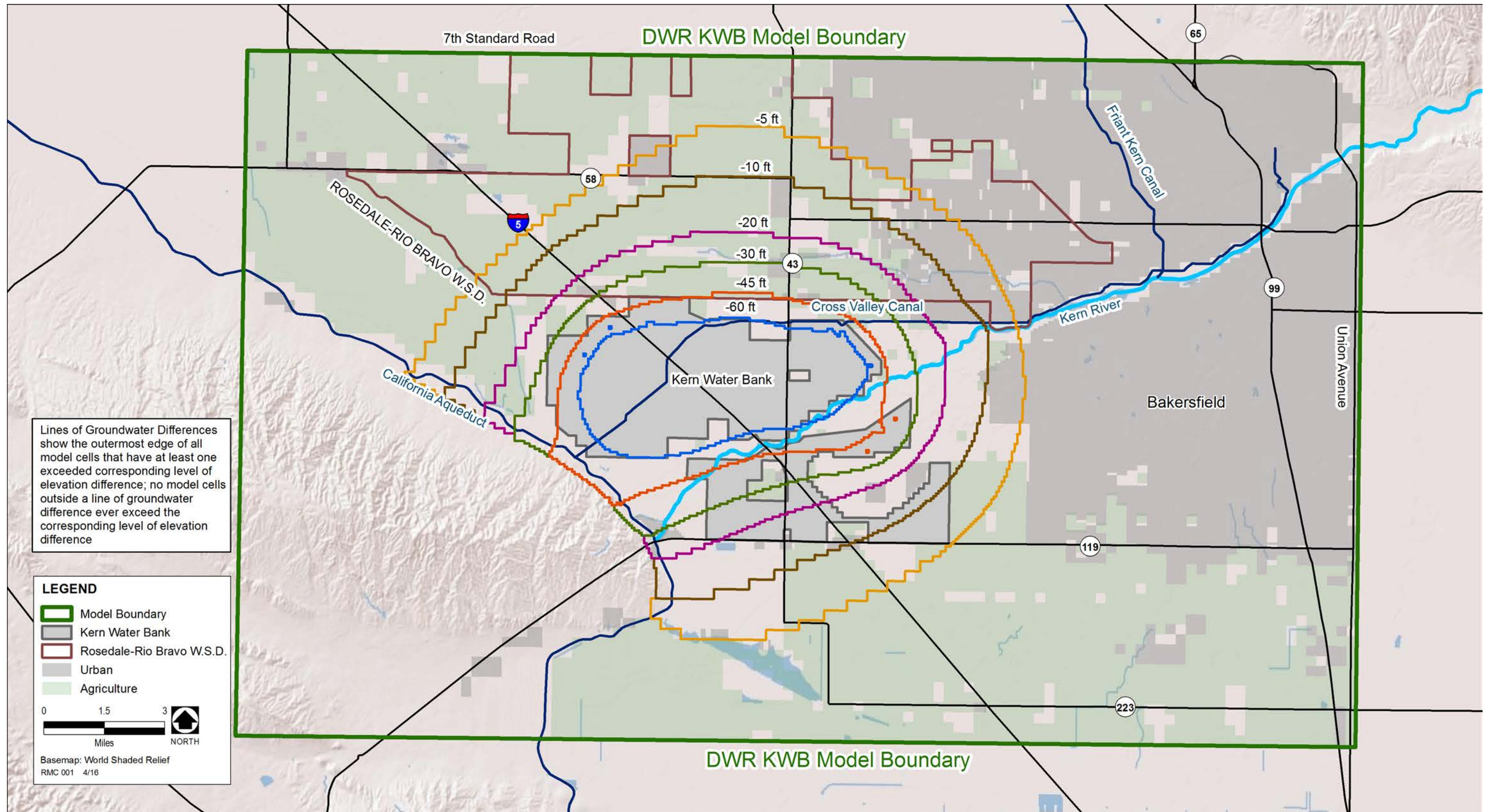


FIGURE 7.1-26. AFO-BC: Contours of Maximum Extent of Negative Differences (“With” minus “Without” KWB Operations), 2015–2035

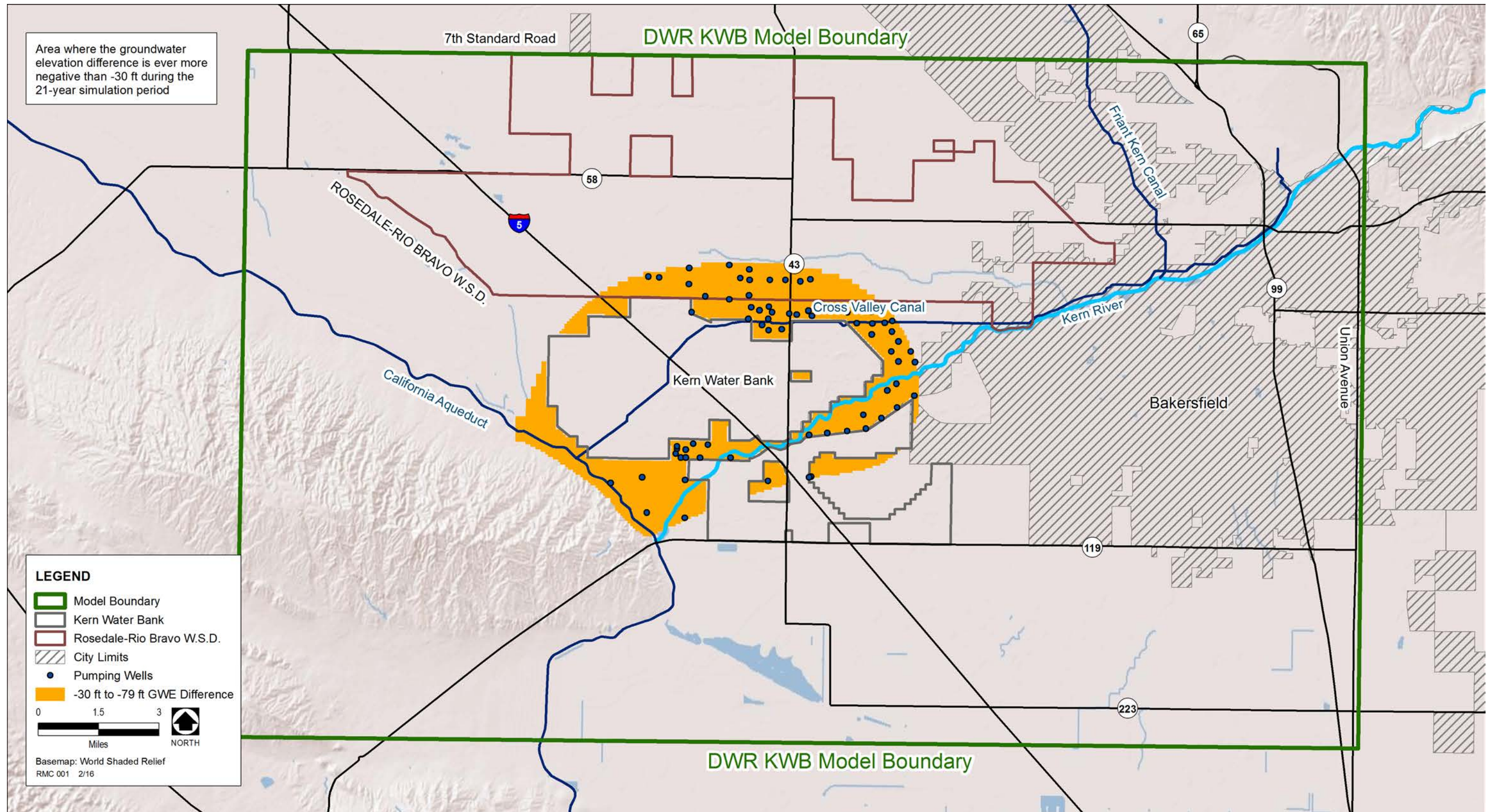


FIGURE 7.1-27. AFO-BC: Location of DWR KWB Model Wells in Areas with Groundwater Elevation Difference Between -30 Feet and -79 feet (“With KWB Operations” minus “Without KWB Operations”), 2015–2035 (These drawdowns reflect maximum drawdown simulated anywhere outside KWB. Maximum drawdown at any well is 66 feet. See Table 7.1-7.)

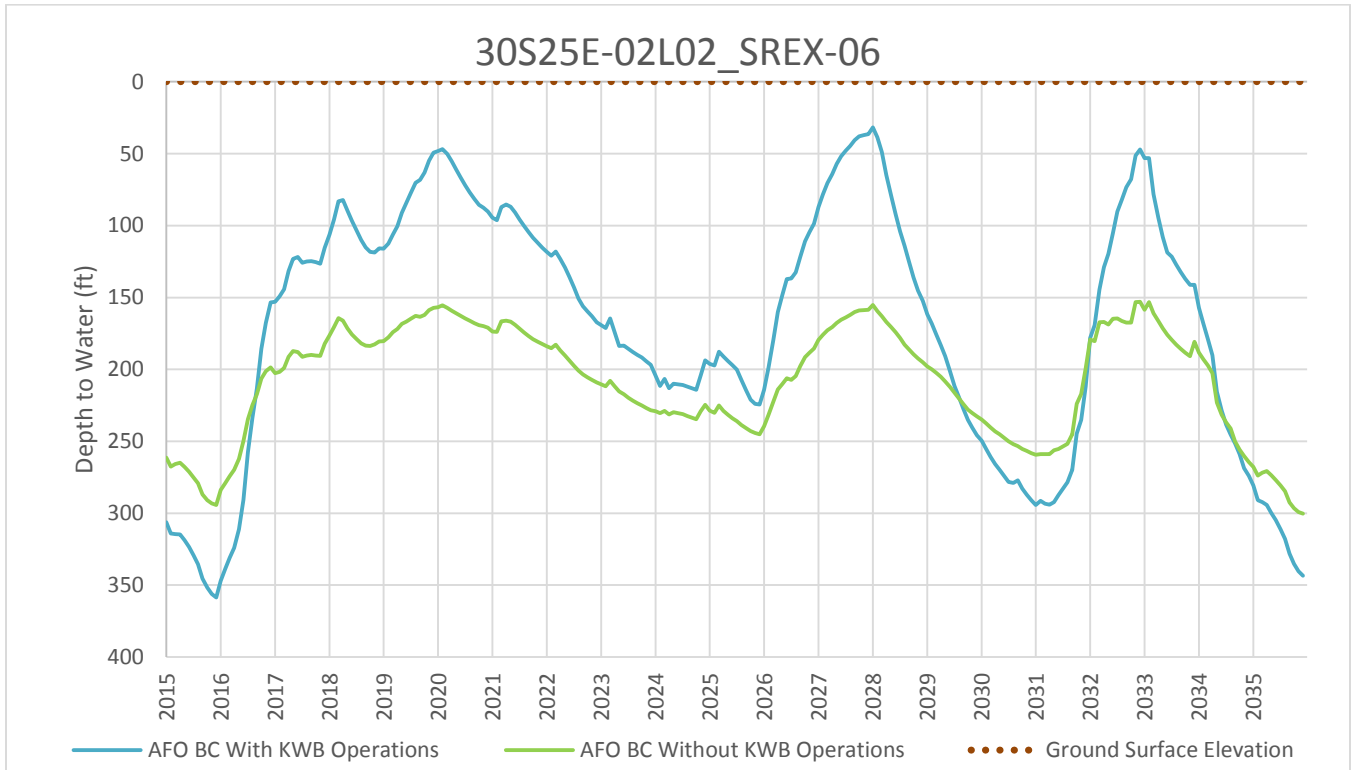


FIGURE 7.1-28. AFO BC: Model Simulated Depth to Water at Production Well 30S25E-02L02 SREX-06

TABLE 7.1-7	
AFO-BC RESULTS: MAXIMUM DRAWDOWN IN EXISTING WELLS OUTSIDE KWB BOUNDARY	
Well Locations	Range of Maximum Drawdown* Simulated in Existing Wells
North of KWB Boundary	30 feet to 63 feet
East of KWB Boundary	30 feet to 46 feet
Southeast of KWB Boundary (2800 Acres and Improvement District No. 4 area)	30 feet to 54 feet
Southwest of KWB Boundary (West Kern Water District)	33 feet to 66 feet

*These drawdowns reflect maximum drawdown simulated in existing wells. Maximum drawdown anywhere outside KWB is 79 feet, which occurs in a location where there are no existing wells. See Figure 7.1-27.

Therefore KWB activities are not expected to have a significant effect on operation of neighboring private landowner wells under historical low groundwater conditions except on those wells that are perforated to a depth less than 380 feet bgs, which would result in less than 20 feet of screened well below water for usage.

Most production wells operated by neighboring water districts have screens that are perforated in the deep aquifer up to approximately 700 feet bgs. For example, two Rosedale productions wells that are in the immediate vicinity of the northern KWB boundary have screen intervals: 177 to 417 feet bgs (29S25E-34H02 Enns-03) and 457 to 737 feet bgs (29S25E-34H01 Enns-02), respectively. The DWR KWB Model predicted that at the shallower Rosedale production well, low water table conditions during

2015-2035 without KWB activities was about 305 feet bgs and with KWB activities was about 334 feet bgs (Figure 7.1-29). This groundwater level is higher than the production well depths of both deeper and shallower Rosedale wells. Since typical production wells are perforated up to 700 feet bgs, KWB activities are not expected to have a significant effect on operation of neighboring production wells under historical low groundwater conditions.

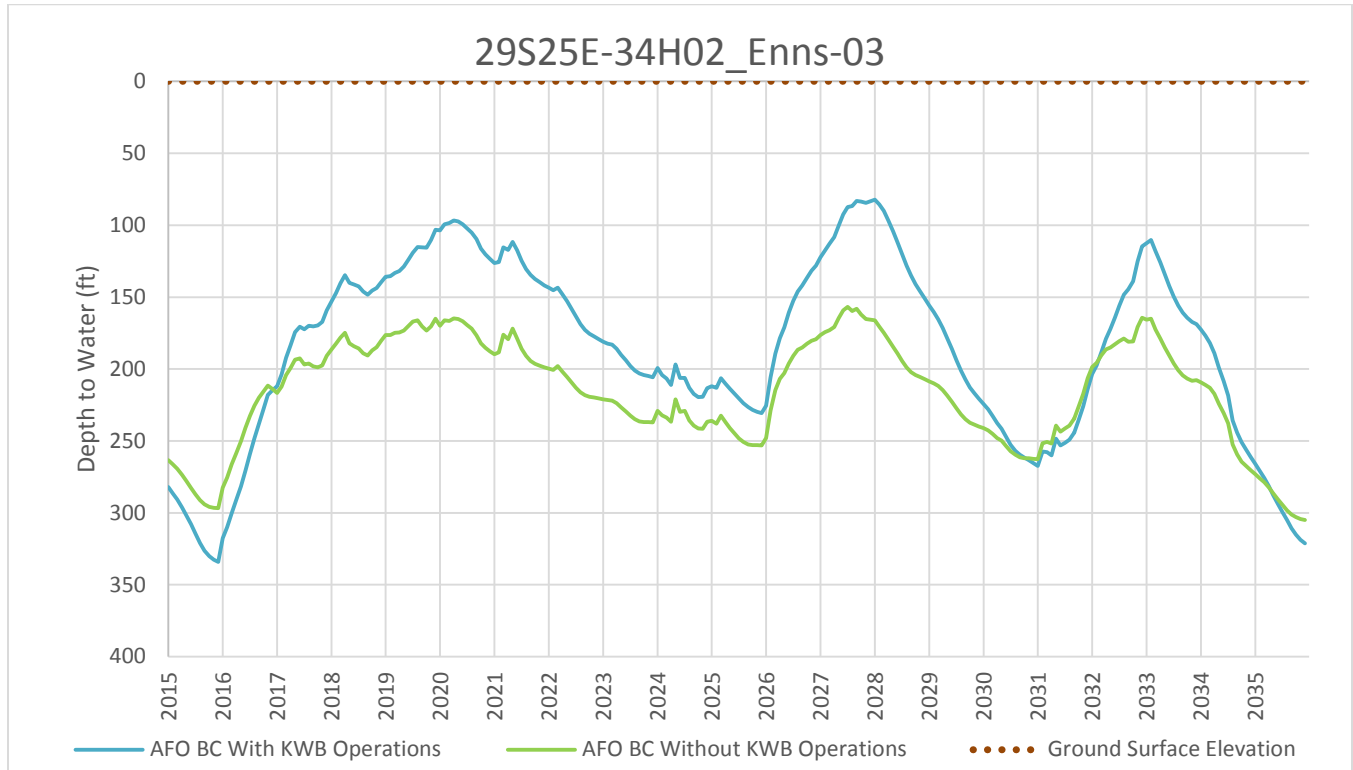


FIGURE 7.1-29. AFO BC: Model Simulated Depth to Water at Production Well 29S25E-34H02 Enns-03

However, whether KWBA's operations would cause an impact that would be potentially significant at a specific agricultural or domestic well would depend on several factors, such as location of the well, depth of the well and operational depth of the pump, pump efficiency, and pumping rate. Because all of this information for each well is not known, the specific potential impacts of KWB activities with respect to lowering of the local groundwater table at specific wells could not be determined through modeling alone. Consequently, lowering of the local water table at sites in the vicinity of KWB could have adverse effects at individual wells.

Therefore, the impact of KWB future operations under build-out conditions from 2015 to 2035 could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted). This impact would be **potentially significant**.

Mitigation Measures (for Future Existing and Build-out Conditions)

KWB activities could result in a potentially significant impact to groundwater elevations near KWB during major recovery periods. Continued well monitoring and implementation of existing agreements regarding KWB operations offer the most feasible and pragmatic approach (i.e., the 1995 KWB MOU,

see Appendix 7-5a; and the 2014 Interim Operations Plan, see Appendix 7-5b). Rosedale has also adopted a long-term operations plan to prevent, eliminate, or mitigate potential impacts from its projects. Rosedale's plan is part of its Stockdale Integrated Banking Project Final EIR dated November 2015. KWBA has adopted the 2016 KWB Long-Term Project Recovery Operations Plan (see Appendix 7-5c) that prevents, eliminates, or mitigates potential impacts from the KWB. It is possible that a joint long-term agreement will be developed in the near future between KWBA, Rosedale, and the Pioneer Project for the coordinated implementation of a long-term banking operations plan that includes standards that address potential cumulative impacts of the participating banks. Mitigation Measure 7.1-2 therefore builds on these existing and proposed agreements.

Implementation of Mitigation Measure 7.1-2 would reduce this impact to less than significant. KWBA is obligated to carry out the measures in Mitigation Measure 7.1-2 (see Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, impacts from KWB activities with regard to groundwater elevations near the KWB during major recovery periods are ***less than significant, with mitigation***.

7.1-2 *KWBA will establish a program that meets the following requirements in accordance with the Long-Term Project Recovery Operations Plan regarding the Kern Water Bank Project (2016 KWB Long-Term Operations Plan, Appendix 7-5c):*

A. *Monitor and Report Groundwater Conditions to KWBA's Board of Directors and the Public*

- 1) *KWBA will monitor groundwater levels monthly, except during periods of no recovery when monitoring will occur at least quarterly. KWBA may rely on monitoring conducted by the Kern Fan Monitoring Committee to meet these requirements.*
- 2) *KWBA will report current groundwater levels to its Board of Directors at each monthly regular meeting, and will make the reports available to the public on its website (<http://www.kwb.org/>).*
- 3) *KWBA will regularly update its Groundwater Model (Model) to actual conditions and use the Model to project future groundwater conditions. KWBA will endeavor to use the best practicable science and latest information available in all modeling and technical matters. KWBA will report the results of its modeling to its Board of Directors and will make the results available to the public on its website (<http://www.kwb.org/>). Recovery of banked groundwater in any calendar year beyond March 15 of that year shall not commence (or continue) until the Model has been run for projected KWB operations and the results have been reported to KWBA's Board of Directors and made available to the public. Because model data for a preceding year becomes available at different times in the following year, modeling at the beginning of any given year will necessitate estimating certain model input data for the preceding year (e.g., Kern River losses). These estimates will be replaced with actual data at regular intervals when the model is updated.*

B. Implement Proactive Measures (in addition to A above)

- 1) *KWBA will use its Model as a tool to evaluate potential groundwater impacts resulting from its project operations. The Model will be periodically run and updated as projected recovery plans become known or changed and the Model will assume such conditions as described in A.3.*
- 2) *The Model will be used to:*
 - a) *Forecast groundwater levels.*
 - b) *Forecast and predict the contribution of KWB Operations to groundwater level declines in the area.*
 - c) *Determine water level conditions with “Without KWB Operations” for purposes of evaluating the potential impact of “With KWB Operations”. The “Without KWB Operations” is the water level that would have been at any particular well location absent “KWB Operations.”*
 - d) *Identify, based upon an analysis of “Without KWB Operations” versus “With KWB Operations,” if a **negative potential impact (“NPI”)** has or is likely to occur for which the measures described at D, E, and F may be operative. **NPI** is determined according to C.1 below.*
 - e) *Forecast any localized areas for special attention and/or additional monitoring where groundwater levels will decline 30 or more feet below the “Without KWB Operations” groundwater level.*
 - f) *Identify wells at risk of potential impacts during recovery operations.*
- 3) *KWBA will provide notification on its website if the Model shows that an **NPI** has or is likely to occur, including steps that potentially affected landowners must follow if the landowner desires to make a claim to KWBA regarding potential well impacts due to KWBA’s recovery operations.*

C. Implement Triggers and Actions

The actions described in sections D, E, and F will be implemented in consultation with affected landowners/well owners that make a claim to KWBA regarding well impacts relating to KWBA’s recovery operations and groundwater level declines, subject to the following:

- 1) *The trigger for mitigation shall be based upon an analysis and comparison of Model generated “Without KWB Operations” versus “With KWB Operations.” When “With KWB Operations” are 30 feet deeper than the “Without KWB Operations” at an operative well, and the well has (or is expected to) experience mechanical failure or other operational problems due to declining water levels, a **negative potential impact (“NPI”)** is triggered. If KWBA enters into a joint operations agreement with other water*

*banks in the area, the depth at which a **NPI** is triggered shall provide an equivalent measure of potential impact as described in the 2016 KWB Long-Term Operations Plan (Appendix 7-5c).*

- 2) *For a well owner to be eligible for mitigation as provided below, the affected landowner shall submit a claim to KWBA, in accordance with the Government Claims Act, which shall, at a minimum, provide information concerning the condition of the well and casing and pumping equipment of the well, and other information that is relevant to the landowner's claim. Upon receipt of a claim, KWBA shall use the Model (or the results of modeling as reported to the Board and the public) to determine whether an **NPI** exists at the landowner's well and respond with the appropriate action described below.*
- 3) *KWBA will provide mitigation and/or compensation for the KWB Operations' contribution to the adverse impact. Mitigation and/or compensation is not required for a well owner's lack of well maintenance, normal wear and tear, depreciation, failure of well equipment, well casing degradation, etc., or other reasons not relating to KWB Operations.*

D. Implement Action for Agricultural Wells When Well Adjustment Is Needed and Available

- 1) *Trigger: When the Model predicts **NPI** for an operational agricultural well outside the current operating range of the pump but within the potential operating range of the well.*
- 2) *KWBA actions will be completed within 60 days (provided that the land/well owner cooperates) from receipt of a claim as follows:*
 - a) *Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline due to KWB operations. If needed:*
 - *Obtain right-of-entry permit and well data release from well owner.*
 - *Collect pump manufacturer data, the in-situ pump setting, and casing depth information.*
 - b) *Compare pump setting information with Model projected pumping water levels throughout the year to determine pump submergence levels and evaluate the necessity and feasibility of lowering the well pump to meet the landowner's needs to provide the least-cost short and long-term solution.*
 - c) *Develop a cost estimate to complete the necessary work.*

- d) *Develop and submit a report to the landowner informing the landowner of the findings and proposed actions, including denying the claim because groundwater declines are not due to KWB operations.*
- 3) *At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the **NPI**, using the Model to identify the well or wells that may require reduction or adjustment in pumping.*
- 4) *If groundwater declines are due to KWB operations, unless D.3 occurs, once agreement is reached between KWBA and the landowner pursuant to D.2.b and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.*

E. Implement Action for Agricultural Wells When Well Adjustment Is Unavailable

- 1) *Trigger: When the Model predicts **NPI** for an operational agricultural well outside the current and potential operating range of the well.*
- 2) *KCWA actions will be completed within 60 days (provided that the land/well owner cooperates) from receipt of a claim as follows:*
 - a) *Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline due to KWB operations. If needed:*
 - *Obtain right-of-entry permit and well data release from well owner.*
 - *Collect pump manufacturer data, the in-situ pump setting, and casing depth information.*
 - b) *Identify water of an equivalent water quantity and quality suitable for agricultural uses for the affected landowner from an alternate source at no greater cost to the affected landowner or, with the consent of the affected landowner, identify acceptable mitigation (for example, drill and equip a new well) to provide the least-cost short- and long-term solution, including an estimate to complete the necessary work.*

Develop and submit a report to the landowner informing the landowner of the findings and resulting proposed actions, including denying the claim because groundwater declines are not due to KWB operations.

- 3) *At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the **NPI** using the Model to identify the well or wells that may require reduction or adjustment in pumping.*

- 4) *If groundwater declines are due to KWB operations, unless E.3 occurs, once an agreement is reached between KWBA and the landowner to provide mitigation pursuant to E.2.b and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.*

F. Implement Action for Domestic Wells

- 1) *Trigger: When the Model predicts **NPI** for a domestic well that is outside the current operating range of the pump but within the potential operating range of the well production.*
- 2) *KWBA's actions will be completed within 60 days (provided that the land/well owner cooperates) from receipt of a claim as follows:*
- a) *Field verify (with the affected landowner if requested) static depth to groundwater levels within the well and compare to Model values to determine if flow stoppage is due to groundwater level decline. If needed:*
- *Obtain right-of-entry permit and well data release from well owner.*
 - *Collect pump manufacturer data, the in-situ pump setting, and casing depth information.*
- b) *Identify availability and cost of a permanent connection to the nearest water service provider.*
- c) *Identify acceptable mitigation (for example, lower the domestic submersible pump bowl setting sufficient to restore and maintain service or drill and equip a new well that complies with applicable county well standards) to provide the least-cost short- and long-term solution, including an estimate to complete the necessary work.*
- d) *Develop and submit a report to the landowner informing the landowner of the findings and resulting proposed actions, including denying the claim because groundwater declines are not due to KWB operations.*
- e) *If necessary for emergency health and safety concerns, provide interim in-home water supplies within 14 days after receipt of the claim until a permanent mitigation action is implemented or the claim has been denied because groundwater declines are not due to KWB operations.*
- 3) *At KWBA's option, it may reduce or adjust pumping of its wells as necessary to prevent, avoid, or eliminate the **NPI** using the Model to identify the well or wells that may require reduction or adjustment in pumping.*
- 4) *If groundwater declines are due to KWB operations, unless F.3 occurs, once an agreement is reached for KWBA to provide mitigation pursuant to F.2.c*

above and all cost estimates have been completed, pay costs associated with the landowner claim (considering C.3 above), including the cost to complete the necessary work.

7.1-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.

1995 – 2014

The KWB has a self-contained system of recharge and recovery facilities (i.e., recharge ponds and pumping wells), entirely within KWB Lands. Existing conveyance facilities and stream courses (i.e., canals, aqueducts, and streams) in the area were used to receive recharge water and deliver recovered water. The recharge ponds were constructed on flat KWB Lands that were followed; construction or operations of these ponds did not alter the existing drainage pattern of the KWB or the neighboring area. The KWB facilities were built alongside the existing Kern River stream channel, but no modifications were made to any portion of the stream channel. KWB activities have had negligible impacts on the rate and amount of surface runoff, and have not contributed to flooding on or off site.

Therefore, the impact of KWB activities from 1995 to 2014 on the existing drainage patterns or on the rate or amount of surface runoff that would result in flooding on or off site was ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. KWBA has also issued a Notice of Preparation in 2012 for the proposed Kern Water Bank Conservation and Storage Project, which would use existing facilities to divert water from the Kern River to increase reliability and enhance the dry-year water supply of KWBA's participating members through storage in the KWB. No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants already have facilities in place to convey and exchange recovered water.

The KWB has a self-contained system of recharge and recovery facilities (i.e., recharge ponds and pumping wells), entirely within KWB Lands. Existing conveyance facilities and stream courses (i.e., canals, aqueducts, and streams) in the area are used to receive recharge water and deliver recovered water. Future recharge ponds would be constructed on flat KWB Lands; construction or operations of these ponds and related facilities would not alter the existing drainage pattern of the KWB or the neighboring area. The proposed KWB facilities would not require modifications to any stream channels. KWB activities would have negligible impacts on the rate and amount of surface runoff, and would not contribute to flooding on or off site.

Therefore, the impact of existing and future KWB facilities and activities from 2015 to 2035 on the existing drainage patterns or on the rate or amount of surface runoff that would result in flooding on or off site would be ***less than significant***.

Mitigation Measures

None required.

7.1-4 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.

1995 – 2014

The KWB is a groundwater bank with recharge and recovery facilities that serves water primarily for agricultural uses. It does not include any housing construction or place housing within a 100-year flood hazard area.

Therefore, KWB activities during 1995 to 2014 did not place housing within a 100-year flood hazard area and there was ***no impact***.

Mitigation Measures

None required.

2015 – 2035

The KWB is a groundwater bank with recharge and recovery facilities that serves water for primarily agricultural uses. It does not include any onsite housing construction. In the future, the KWB would continue to be a groundwater bank with recharge and recovery facilities that would operate in a similar fashion. The KWB would not include any future onsite housing construction or place housing within a 100-year flood hazard area.

Therefore, KWB activities during 2015 to 2035 would not place housing within a 100-year flood hazard area and there would be ***no impact***.

Mitigation Measures

None required.

7.1-5 Place within a 100-year flood hazard area structures that would impede or redirect flood flows.

1995 – 2014

The Kern River passes through the KWB area. The KWB is a groundwater bank with limited physical facilities such as recharge ponds, canals, recharge and pumping stations, access roads, and underground recovery wells. No aboveground structures related to the KWB impeded or redirected Kern River flood flows.

Therefore, impacts from KWB activities from 1995 to 2014 did not place any structures that would impede or redirect flood flows. The impact was ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

The Kern River passes through the KWB area. The KWB is a groundwater bank with limited physical facilities such as recharge ponds, canals, recharge and pumping stations, access roads, and underground recovery wells. Construction and operations of new recharge ponds and related facilities would not place structures that would impede or redirect flood flows or alter the existing drainage pattern of the KWB or the neighboring area. No above ground structures related to the KWB would impede or redirect Kern River flood flows.

Therefore, impacts from KWB activities from 2015 to 2035 would not place any structures that would impede or redirect flood flows. The impact would be ***less than significant***.

Mitigation Measures

None required.

7.1-6 Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or cause inundation by seiche, tsunami, or mudflow.

1995 – 2014

The KWB is located on a generally flat, relatively barren land area with little infrastructure including recharge ponds, canals, recharge and pumping stations, access roads, and underground recovery wells. There are no levees or dams as part of the KWB, nor do KWB activities affect risk of failure of any levee or dam. The inland and level location of the KWB and its nature ensured that it did not cause inundation by seiche, tsunami, or mudflow.

Therefore, KWB activities during 1995 to 2014 would not expose people or structures to any risk of loss, injury, or death involving flooding. There was ***no impact***.

Mitigation Measures

None required.

2015–2035

As of 2035, the KWB would continue to be located on a flat, relatively barren land area with little infrastructure including recharge ponds, canals, recharge and pumping stations, access roads, and underground recovery wells. Some additional recharge ponds and related facilities would be constructed and in operation under build-out conditions. There are no levees or dams as part of the KWB, nor would KWB activities affect risk of failure of any levee or dam. The inland and level location of the KWB and its nature ensures that it would not cause inundation by seiche, tsunami, or mudflow.

Therefore, KWB activities during 2015 to 2035 would not expose people or structures to any risk of loss, injury, or death involving flooding. There would be ***no impact***.

Mitigation Measures

None required.

7.1-7 Raise groundwater levels sufficiently to substantially impact existing infrastructure (e.g., Cross Valley Canal).

Historic recharge operations at the KWB during the past recharge periods of 1995-1998, 2005-2006, and 2011, together with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations within KWB Lands and surrounding areas. Approximately 7 miles of the CVC are located within KWB Lands, and past high groundwater elevations may have contributed to damages to the CVC lining in the mid-1990s. Results of APO, AFO-EC, and AFO-BC model scenarios were evaluated to determine the potential impact of KWB recharge operation during high groundwater elevations on the CVC.

1995 – 2014 (Analysis of Past Operations)

Impacts of KWB recharge operations during high groundwater elevations for APO on the CVC were evaluated by analyzing water levels at locations along the CVC.

Figure 7.1-30 shows the locations of the two selected water level hydrographs along the CVC. The hydrograph locations were selected based on locations of the piezometers jointly owned by KCWA and KWBA and pumping stations of the CVC to provide known points of reference while analyzing water levels at two distinct locations along the CVC within KWB; these hydrographs are used to demonstrate the impacts on the CVC.

Figure 7.1-32 shows the groundwater level hydrographs at two selected locations along the CVC. The hydrographs show the water levels at the selected locations for the APO With and Without KWB operations, ground surface elevation, and the CVC invert elevation. The modeled potential and actual impacts of the KWB recharge operations on the CVC are discussed below.

Modeled Potential Impacts on the CVC

Modeled potential impacts on the CVC are as follows:

- 1995-1998 Recharge Operations – Water levels rose to within 5 feet from ground surface as shown in the hydrograph in the western part of KWB Lands while the water levels were lower in the hydrograph north of KWB Lands.
- 2005-2006 Recharge Operations – Water levels rose to within 5 feet from ground surface as shown in the hydrograph in the western part of KWB Lands while the water levels were lower in the hydrograph north of KWB Lands.
- 2011 Recharge Operations – Water levels were lower than 50 feet from surface as shown in the two hydrographs along the CVC in the KWB area. Water levels in 2011 were generally lower than that after 1995-1998 and 2005-2006 recharge operations. This is partly due to 2011 being a single-year recharge period while the other two recharge periods are four- and two-year recharge periods, respectively.

Actual Impacts on the CVC

During 1998, damage occurred to the CVC. High groundwater resulting from natural conditions, offsite recharging, or recharging on the KWB Lands could impact the integrity of CVC structures or cause cracks in sub-surface concrete panels. Discussions between KWBA and KCWA (which operates the CVC) resulted in repairs to the CVC in the early 2000s. As part of the discussions, KWBA and KCWA agreed to the following water level monitoring and recharge operations management (Appendix 7-5e):

- a). Several measures had already been undertaken by KWBA including installing a shallow groundwater monitoring network, conducting regular monitoring and evaluation of shallow groundwater conditions, and reducing recharge activities in the vicinity of the CVC.
- b). KCWA and KWBA are monitoring water levels frequency, evaluating groundwater conditions on a weekly/monthly basis, and coordinating water operations.
- c). KWBA will manage recharge operations to help ensure that groundwater gradient is away from the CVC during shallow groundwater conditions. Should groundwater conditions develop that might induce piping behind the CVC's liner, KWBA will minimize recharge adjacent to the CVC either by reducing inflow to adjacent ponds or increasing the setbacks of adjacent ponds. The goal of these actions will be to prevent flow into the CVC.
- d). During periods where shallow groundwater conditions exist, the CVC will be operated in such a manner as to maintain higher-than-normal pool levels, unless prohibited by delivery demands. Also, additional low-level cut-off float switches, adjustment of low-level alarms, and improved monitoring of CVC forebay levels have been incorporated into CVC operations during periods where shallow groundwater conditions exist. In addition to the above, regular inspections of the CVC's concrete liner will continue to be conducted, and any observed voids will be repaired promptly.

With implementation of the above measures, impacts from KWB operations from 1995 to 2014 to the CVC during major recharge periods were ***less than significant***.

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations—Existing Conditions)

Impacts of KWB recharge operations during future recharge operations under AFO-EC conditions on the CVC were evaluated by analyzing water levels at locations along the CVC under the future recharge scenarios based on the operating assumptions in the KWBA-KCWA agreement discussed above (Appendix 7-5e).

Figure 7.1-30 shows the locations of the two selected water level hydrographs along the CVC. The hydrograph locations were selected based on locations of the piezometers and pumping stations of the CVC; these hydrographs are used to demonstrate the impacts on CVC.

Figure 7.1-34 shows the groundwater level hydrographs at two selected locations along the CVC. The hydrographs show the water levels at the selected locations for the AFO-EC With and Without KWB operations, ground surface elevation, and the CVC invert elevation. It is assumed that the CVC invert is 10 feet below ground surface. The impact of KWB recharge operations on the CVC is discussed below:

- 2016-2019 Recharge Operations – Depth to groundwater is greater than 50 feet at the hydrographs along the CVC in the KWB area and no potential impact to the CVC is expected because of low groundwater elevations.
- 2026-2027 Recharge Operations – No potential impacts to the CVC are expected as groundwater elevations are similar to 2016-2019 conditions.
- 2032 Recharge Operations – No potential impacts to the CVC are expected as groundwater elevations are lower than 2016-2019 conditions.

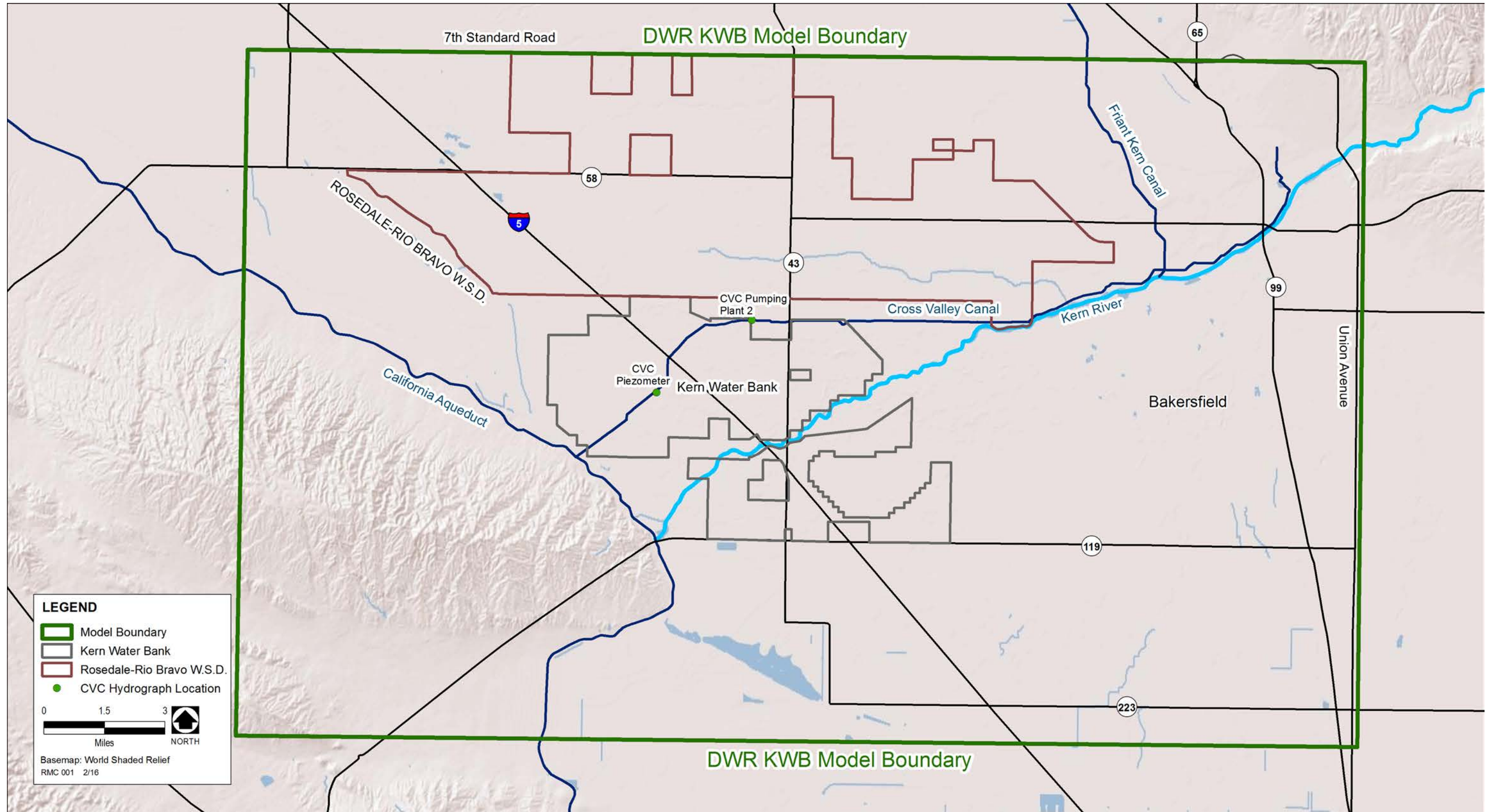


FIGURE 7.1-30. Selected Hydrograph Locations along the Cross Valley Canal

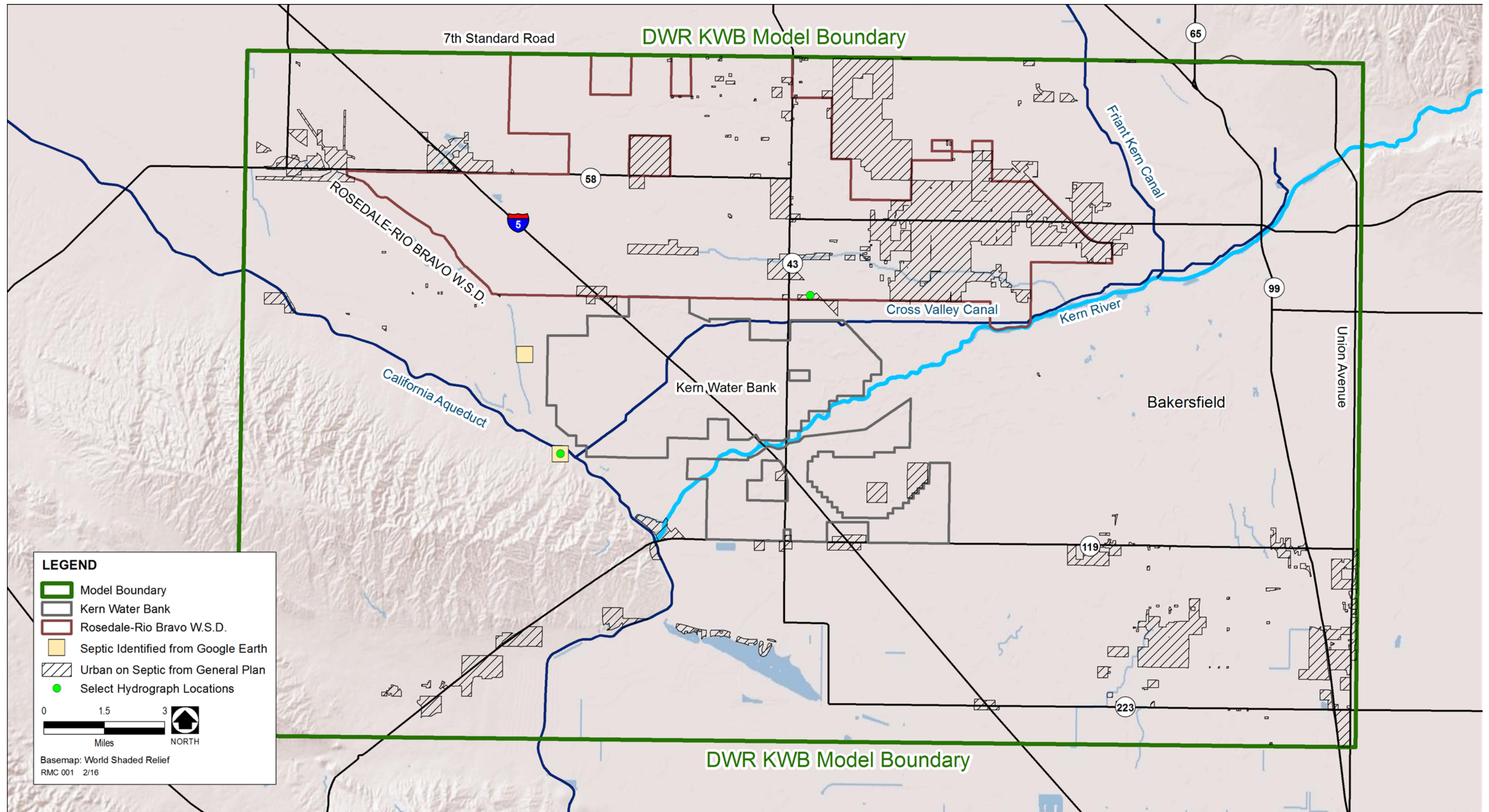


FIGURE 7.1-31. Potential Urban Areas on Septic Systems near KWB Lands

As summarized in the analysis above, KWB operations under AFO-EC scenario conditions during periods of KWB recharge could cause groundwater levels to increase. High groundwater resulting from natural conditions, offsite recharging, or recharging on the KWB Lands could impact the integrity of CVC structures or cause cracks in sub-surface concrete panels. Therefore this impact is potentially significant. KCWA and KWBA have agreed to certain water level monitoring and recharge operations management and these measures have helped assure that KWBA operations would not harm the CVC (Appendix 7-5e).

Therefore, the impact of KWB activities from 2015 to 2035 under AFO-EC scenario conditions with regard to the effect of high groundwater levels during recharge on the CVC would be **potentially significant**.

2015 – 2035 (Analysis of Future Operations—Build-out Conditions)

Impact of KWB recharge operations during future recharge operations at the KWB under AFO-BC conditions on the CVC were evaluated by analyzing water levels at locations along the CVC.

Figure 7.1-30 shows the locations of the two selected water level hydrographs along the CVC. The hydrograph locations were selected based on locations of the piezometers and pumping stations of the CVC; these hydrographs are used to demonstrate the impact on the CVC.

Figure 7.1-36 shows the groundwater level hydrographs at two selected locations along the CVC. The hydrographs show the water levels at the selected locations for the AFO-BC With and Without KWB operations, ground surface elevation, and the CVC invert elevation. It is assumed that the CVC invert is 10 feet below ground surface. The impact of the KWB recharge operations on the CVC is discussed below:

- 2016-2019 Recharge Operations – Depth to groundwater is greater than 40 feet at the hydrographs along the CVC in the KWB area and no potential impact to the CVC is expected.
- 2026-2027 Recharge Operations – No potential impacts to the CVC are expected as groundwater elevations are similar to 2016-2019 conditions.
- 2032 Recharge Operations – No potential impacts to the CVC are expected as groundwater elevations are lower than 2016-2019 and 2026-2027 water levels.

As summarized in the analysis above, KWB operations under AFO-BC scenario conditions during periods of KWB recharge could cause groundwater levels to increase. High groundwater resulting from natural conditions, offsite recharging, or recharging on the KWB Lands could impact the integrity of CVC structures or cause cracks in sub-surface concrete panels. Therefore this impact is potentially significant. KCWA and KBWA have agreed to certain water level monitoring and recharge operations management and these measures have helped assure that KWBA operations would not harm the CVC (Appendix 7-5e).

Therefore, the impact of KWB activities from 2015 to 2035 under the AFO-BC scenario with regard to the effect of high groundwater levels during recharge on the CVC would be **potentially significant**.

Mitigation Measures (for Future Existing and Build-out Conditions)

Mitigation Measure 7.1-7 would reduce impacts of KWB activities with regard to impacts on existing infrastructure to less than significant. KWBA is obligated to carry out the measures relating to its actions in subsections a) and b) below (Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, the impact of KWB activities from 2015 to 2035 with regard to impacts on the CVC would be **less than significant, with mitigation**.

7.1-7 *KWBA will implement the following measures in accordance with the KCWA and KWBA CVC Agreement (Appendix 7-5e):*

- a). KWBA will monitor water levels frequency, evaluating groundwater conditions on a weekly/monthly basis.
- b). KWBA will coordinate water operations with KCWA.
- c). KWBA will manage recharge operations to help ensure that groundwater gradient is away from the CVC during shallow groundwater conditions. Should groundwater conditions develop that might induce piping behind the CVC's liner, KWBA will minimize recharge adjacent to the CVC either by reducing inflow to adjacent ponds or increasing the setbacks of adjacent ponds.

7.1-8 Raise groundwater levels sufficiently to substantially impact existing infrastructure (e.g., septic systems).

Historic recharge operations at the KWB during the past recharge periods of 1995-1998, 2005-2006, and 2011, together with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations within KWB Lands and surrounding areas. Urban areas to the east and northeast of KWB Lands use septic systems. Additionally, there are small residential areas in the vicinity of KWB Lands that are on septic systems or dry wells. High groundwater elevations in these areas could potentially impact the septic systems and dry wells.

Results of APO, AFO-EC, and AFO-BC model scenarios were evaluated to determine the potential impact of KWB recharge operation during high groundwater elevations on nearby areas on septic systems.

1995 – 2014 (Analysis of Past Operations)

Figure 7.1-31 shows the areas near KWB Lands that are on septic systems or dry wells as obtained from the Kern County General Plan and Google Earth; it also shows the locations of two selected water level hydrographs used to demonstrate the impacts on septic areas. Figure 7.1-33 shows water level hydrographs at two locations near KWB Lands with groundwater levels that have the potential to impact septic systems. The hydrographs show the water levels for the APO With and Without KWB Operations and the ground surface elevation and facilitate the following conclusions:

- 1995-1998 Recharge Operations – Depth to groundwater in areas in the vicinity of KWB Lands with septic systems or dry wells was more than 35 feet west of KWB Lands and more than 40 feet north of KWB Lands. Groundwater elevations are not high enough to impact the septic systems of these areas.
- 2005-2006 Recharge Operations – Similar to 1995-1998 conditions, depth to groundwater in areas in the vicinity of KWB Lands with septic systems or dry wells were more than 50 feet west of KWB Lands and more than 65 feet north of KWB Lands. No impact to septic systems is expected.
- 2011 Recharge Operations – Depth to groundwater as a result of 2011 recharge operations were more than the previous two recharge periods. Depth to groundwater was more than 125 feet west of KWB Lands and more than 90 feet north of KWB Lands. Groundwater elevations were not high enough to impact septic systems.

As summarized in the analysis above, KWB operation under APO scenario conditions did not cause groundwater levels to rise such that the septic systems in the vicinity of KWB Lands were significantly impacted.

Therefore, impacts from KWB operations during 1995 to 2014 did not raise groundwater levels sufficiently to substantially impact septic systems and the impact was ***less than significant***.

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations—Existing Conditions)

Impacts of KWB recharge operations during future recharge operations under AFO-EC conditions on septic systems were evaluated by analyzing water levels at locations at nearby areas with septic systems under the future recharge scenarios.

Figure 7.1-31 shows the areas near the KWB that are on septic systems or dry wells as obtained from the Kern County General Plan and Google Earth; it also shows the locations of two selected water level hydrographs used to demonstrate the impacts on septic areas.

As summarized in the analysis above, KWB operations under AFO-EC scenario conditions during periods of KWB recharge could cause groundwater levels to increase but not to significantly impact the septic systems.

Therefore, impacts from KWB operations during 2015 to 2035 would not raise groundwater levels sufficiently to substantially impact septic systems and the impact would be ***less than significant***.

Mitigation Measures

None Required.

2015 – 2035 (Analysis of Future Operations—Build-out Conditions)

Impact of KWB recharge operations during future recharge operations at the KWB under AFO-BC conditions on septic systems or dry wells were evaluated by analyzing water levels at locations at nearby areas with septic systems.

Figure 7.1-31 shows the areas near the KWB that are on septic systems or dry wells as obtained from the Kern County General Plan and Google Earth; it also shows the locations of two selected water level hydrographs used to demonstrate the impacts on septic areas.

As summarized in the analysis above, KWB operations under AFO-BC scenario conditions during periods of KWB recharge could would not cause groundwater levels to increase but not to levels that would cause significant impacts such that damage would occur to significantly impact septic systems.

Therefore, the impact of KWB activities from 2015 to 2035 with regard to the effect of high groundwater levels during recharge on existing septic systems would be ***less than significant***.

Mitigation Measures

None required.

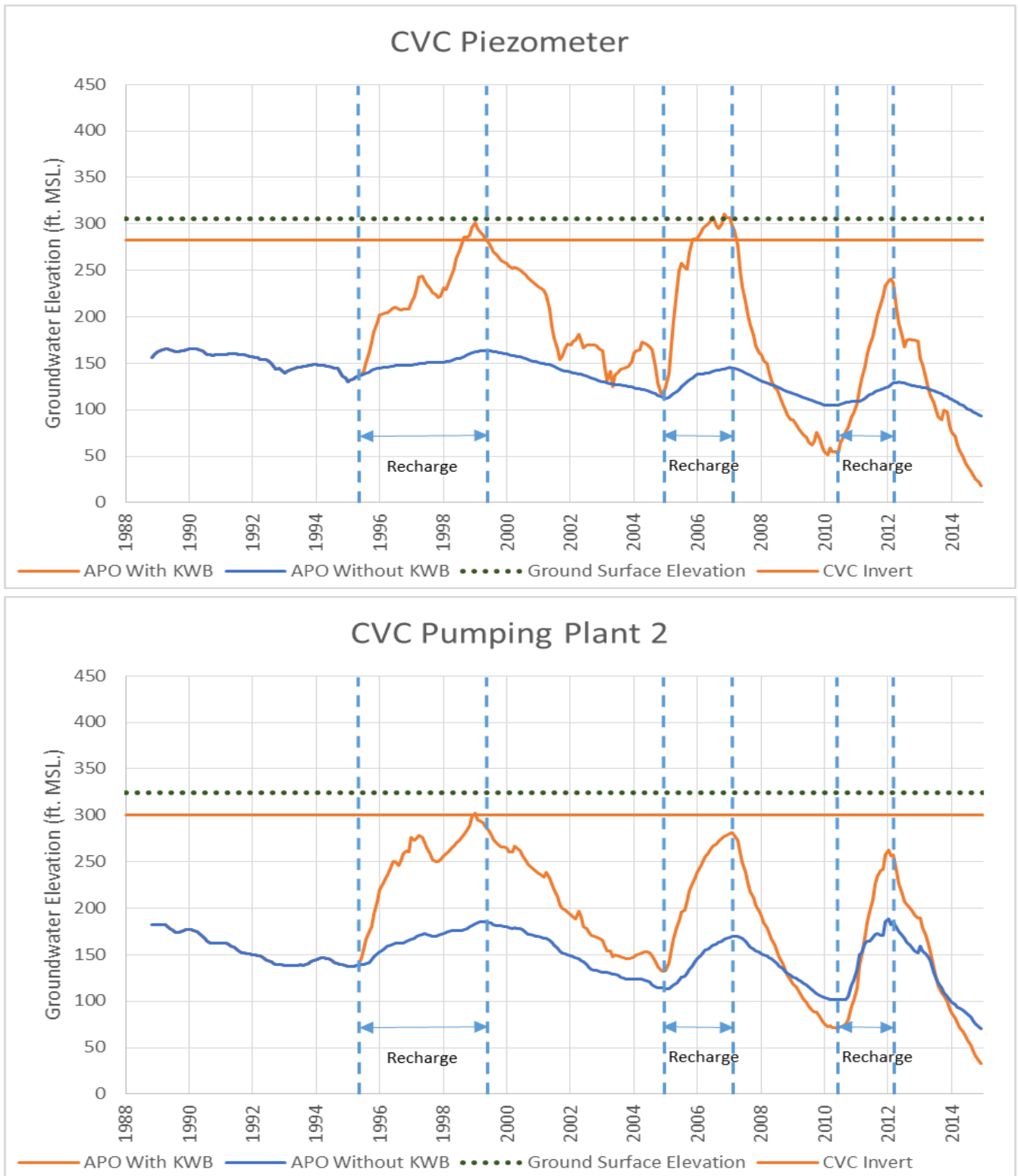


FIGURE 7.1-32. Groundwater Elevation Hydrographs at Selected Locations along the Cross Valley Canal for APO Scenario

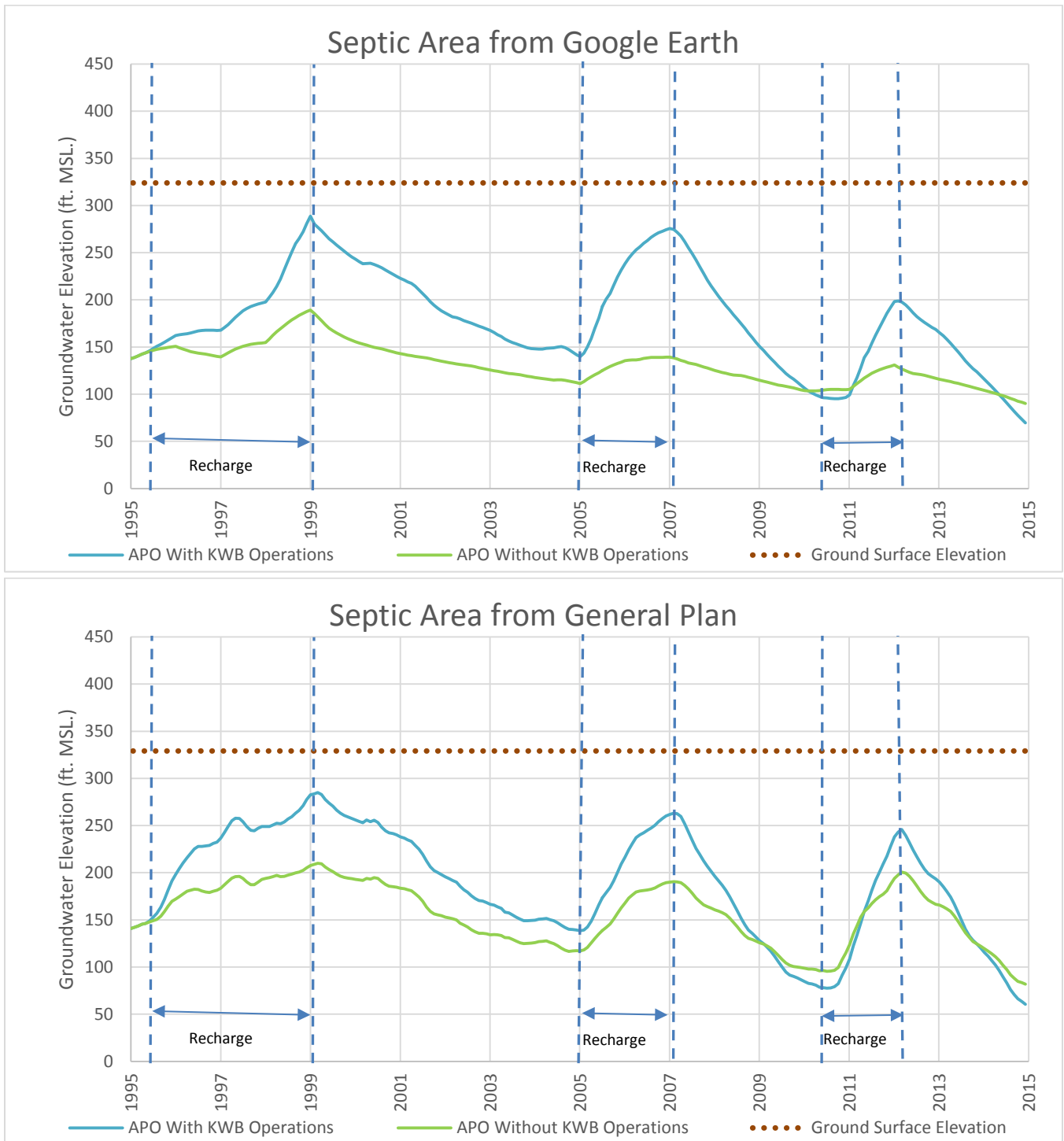


FIGURE 7.1-33. Groundwater Elevation Hydrographs at Selected Areas on Septic Systems for APO Scenario

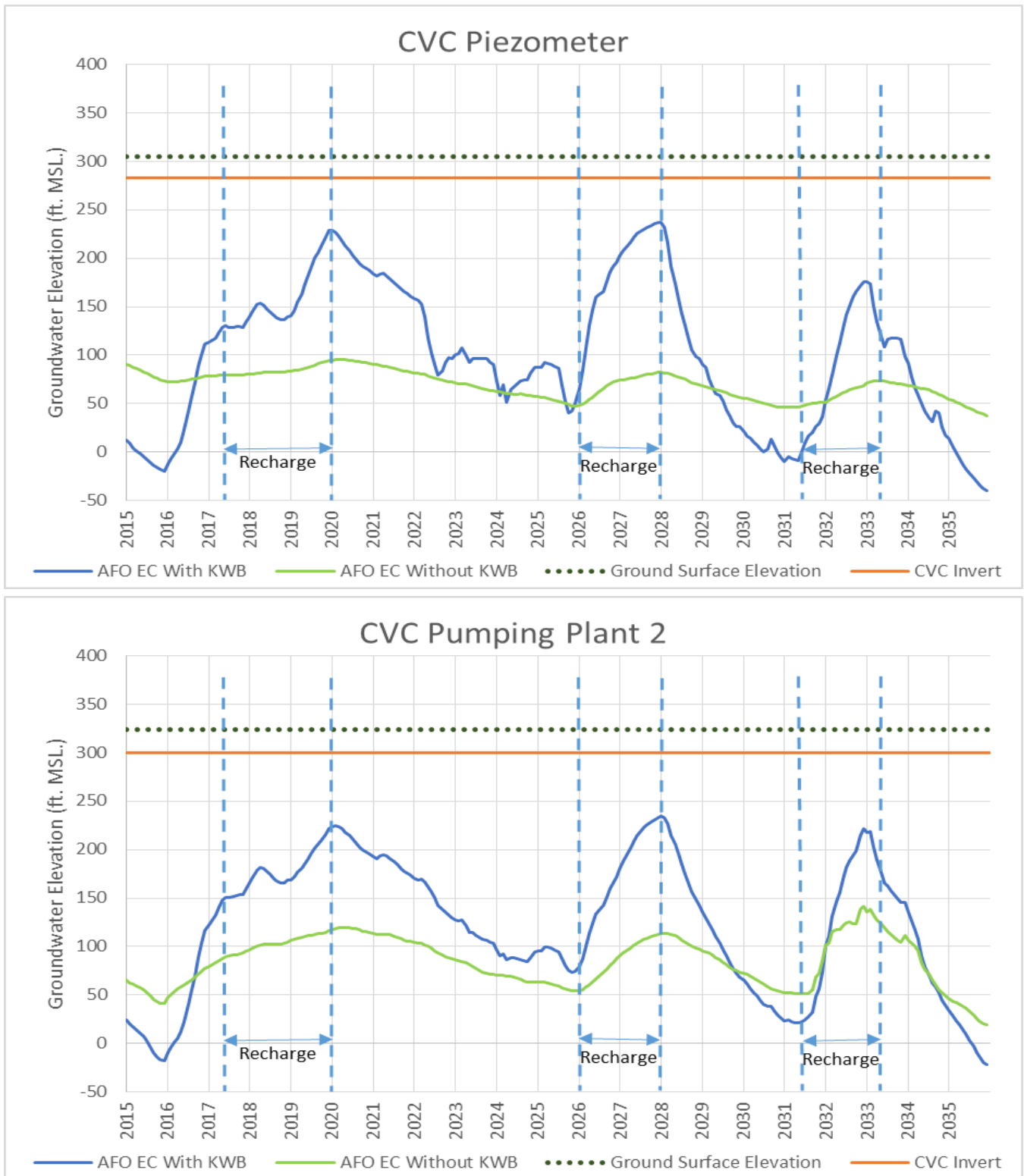


FIGURE 7.1-34. Groundwater Elevation Hydrographs at Selected Locations along the CVC for AFO-EC Scenario

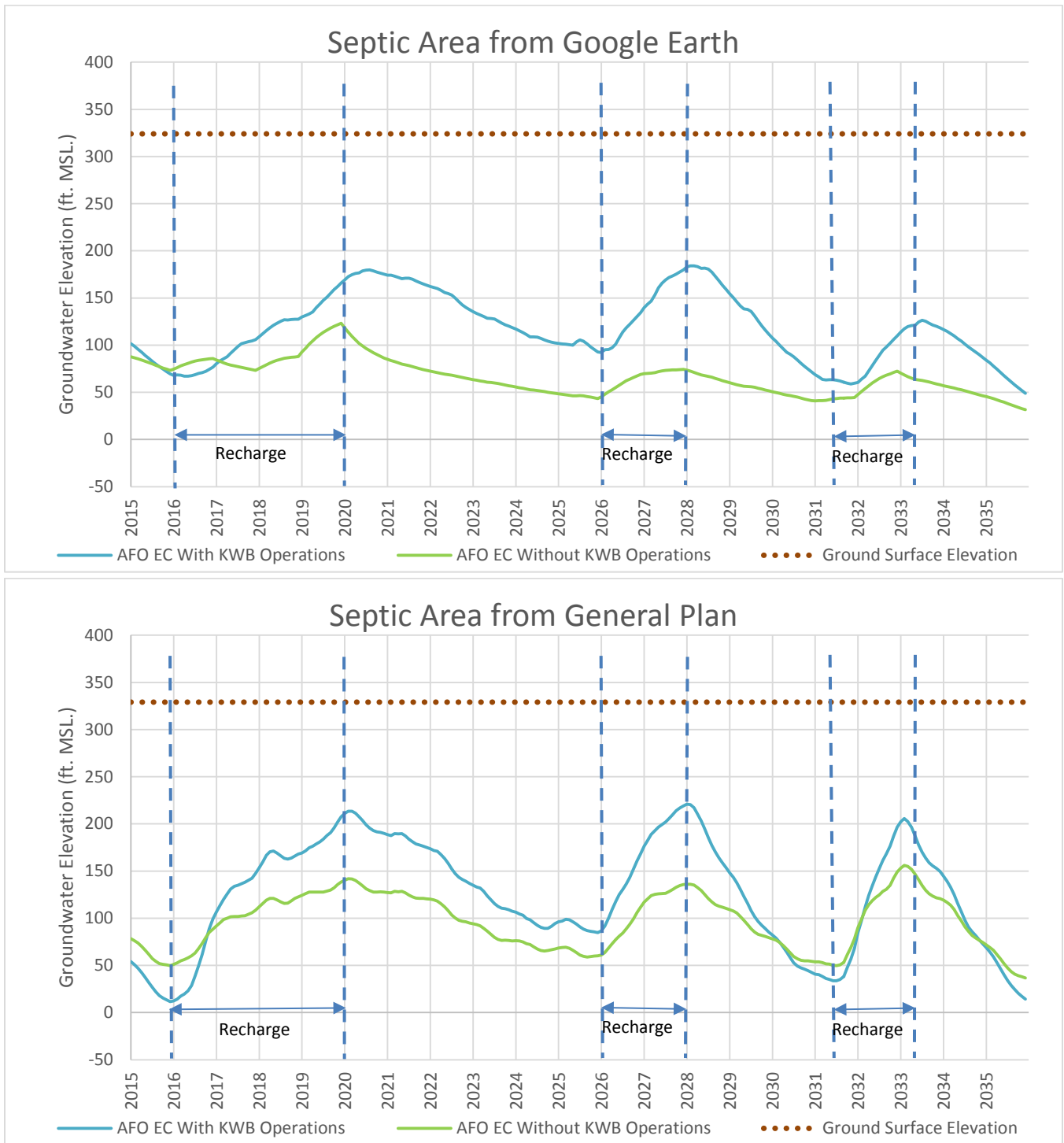


FIGURE 7.1-35. Groundwater Elevation Hydrographs at Selected Areas on Septic Systems for AFO-EC Scenario

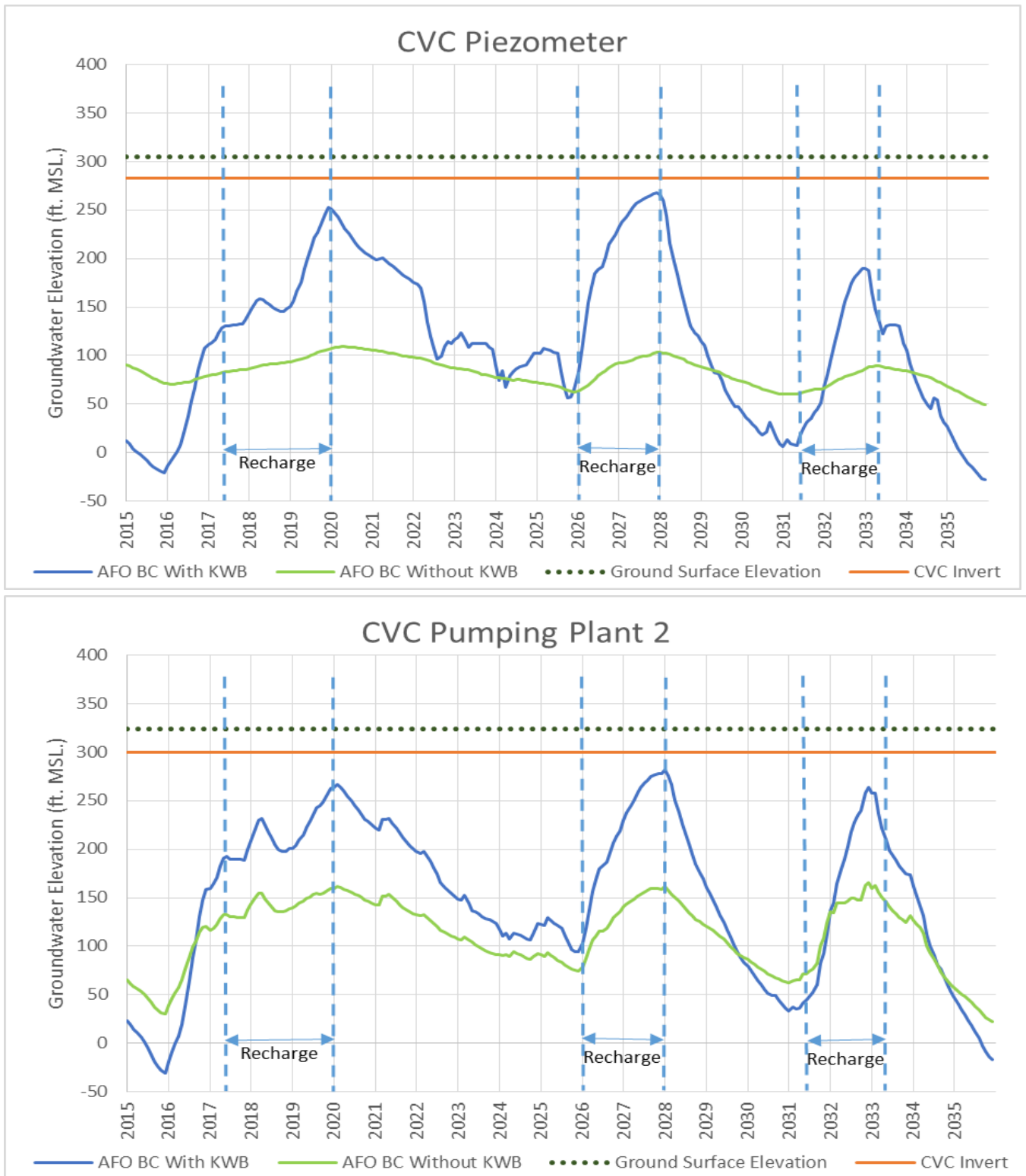


FIGURE 7.1-36. Groundwater Elevation Hydrographs at Selected Locations along the CVC for AFO-BC Scenario

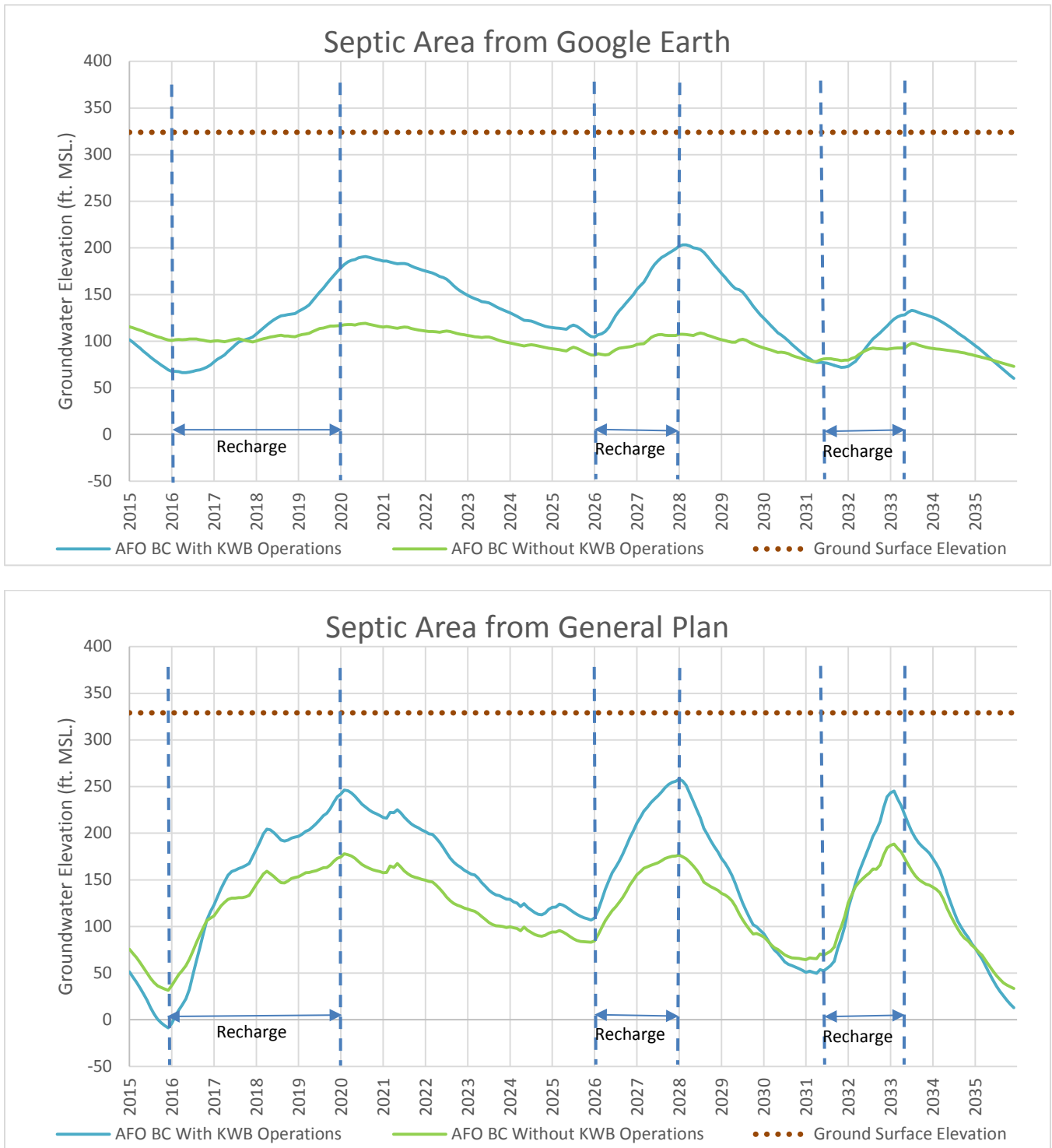


FIGURE 7.1-37. Groundwater Elevation Hydrographs at Selected Areas on Septic Systems for AFO-BC Scenario

7.1-9 Raise water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge.

Historic recharge operations at the KWB during the recharge periods of 1995-1998, 2005-2006, and 2011, in conjunction with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations in KWB and surrounding areas. High groundwater elevations could potentially effect recharge operations at neighboring recharge facilities, such as Rosedale recharge basins north of KWB, Pioneer and 2800 Acre recharge facilities east of KWB, and West Kern Water District recharge facilities south of KWB.

Results of APO, AFO-EC, and AFO-BC model scenarios were evaluated to determine the impact of KWB recharge operations on the neighboring recharge facilities during high groundwater elevations with all the groundwater banks operating simultaneously.

1995 – 2014 (Analysis of Past Operations)

Impacts of KWB recharge operations on the recharge operations of neighboring recharge facilities during high groundwater elevations with all the groundwater banks operating simultaneously under APO conditions were evaluated by using water level hydrographs at these recharge facilities.

Figure 7.1-38 shows the locations of the selected water level hydrographs at the neighboring recharge facilities. Figure 7.1-39 shows the water level hydrographs at these locations. Table 7.1-8 shows the modeled minimum depth to water under APO conditions at the four selected recharge facilities. The impact of the KWB recharge operations on the neighboring recharge facilities during high groundwater elevations with all the groundwater banks operating simultaneously are discussed below.

- 1995-1998 Recharge Operations – The water level analysis shows that at the adjacent recharge facilities, groundwater levels almost reached the ground surface in 2800 Acre recharge facility with all other groundwater banks in the area operating simultaneously; the groundwater mounding associated with the KWB operations and all the groundwater banks operating simultaneously would potentially interfere with recharge operations of neighboring groundwater banks at individual ponds. Any impact of KWB operations in West Kern Water District is resolved by an existing agreement between West Kern Water District and KWBA (see Appendix 7-5e). This agreement is discussed in Revised Appendix E Section VI.B.2.
- 2005-2006 Recharge Operations – The water levels at the adjacent recharge facilities were generally lower than 1995-1998 conditions and groundwater levels did not reach the ground surface; thus, the groundwater mounding associated with the KWB operations and all the groundwater banks operating simultaneously did not preclude recharge operations of neighboring groundwater banks.

Simulation Period	Recharge Facility			
	Rosedale	Pioneer	2800 Acre	West Kern WD
1995-1998	33	6.3	0.1	4.2
2005-2006	50.9	19.4	4.5	13.6
2011	66.6	48.3	44.3	33.4

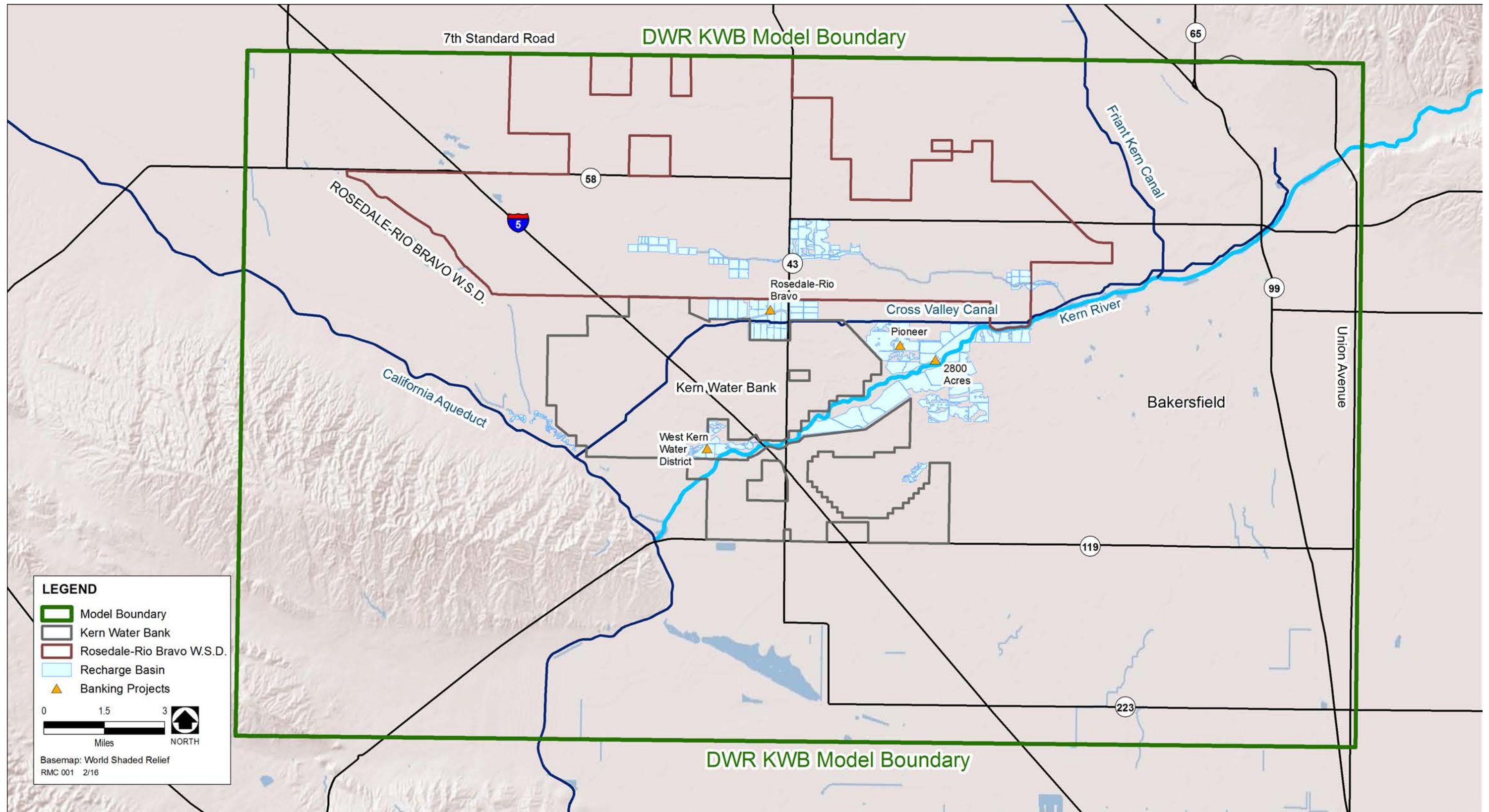


FIGURE 7.1-38. Groundwater Recharge Projects Neighboring Kern Water Bank and Locations of Selected Water Levels Hydrographs

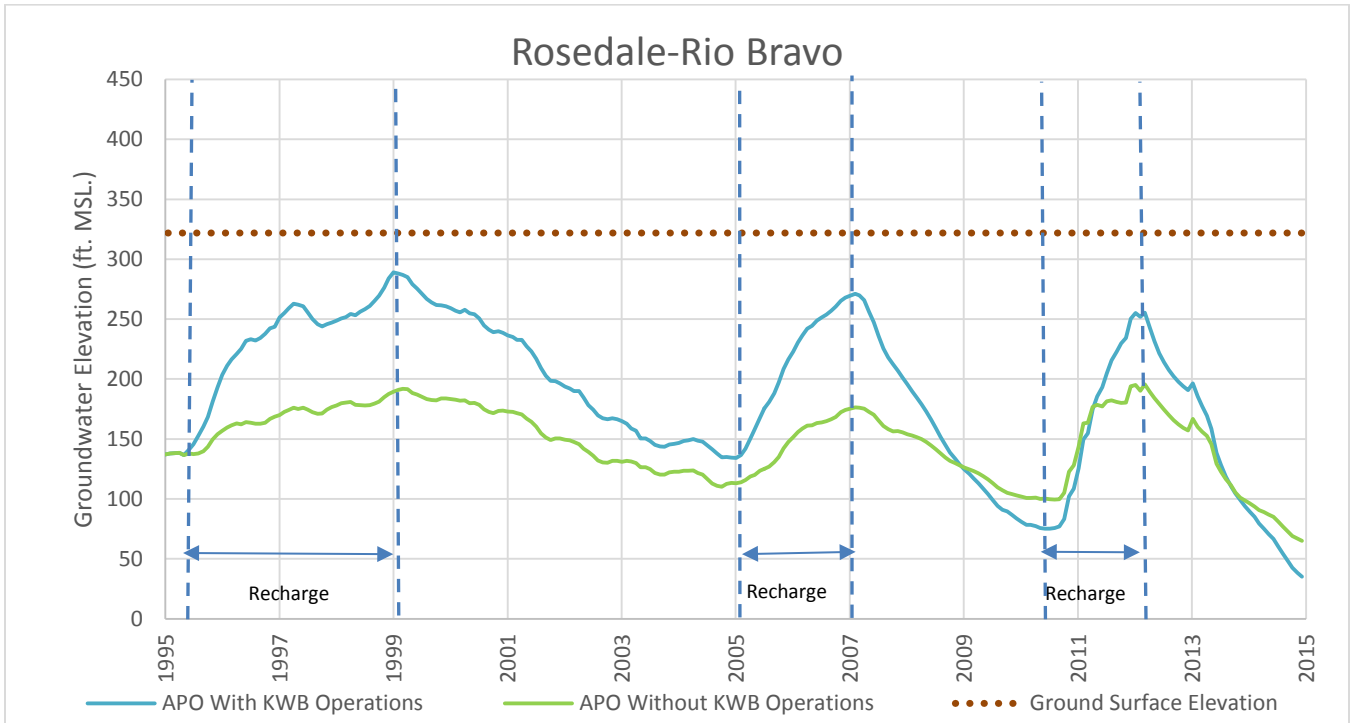


FIGURE 7.1-39a. Groundwater Elevation Hydrographs at Rosedale-Rio Bravo Recharge Pond for APO

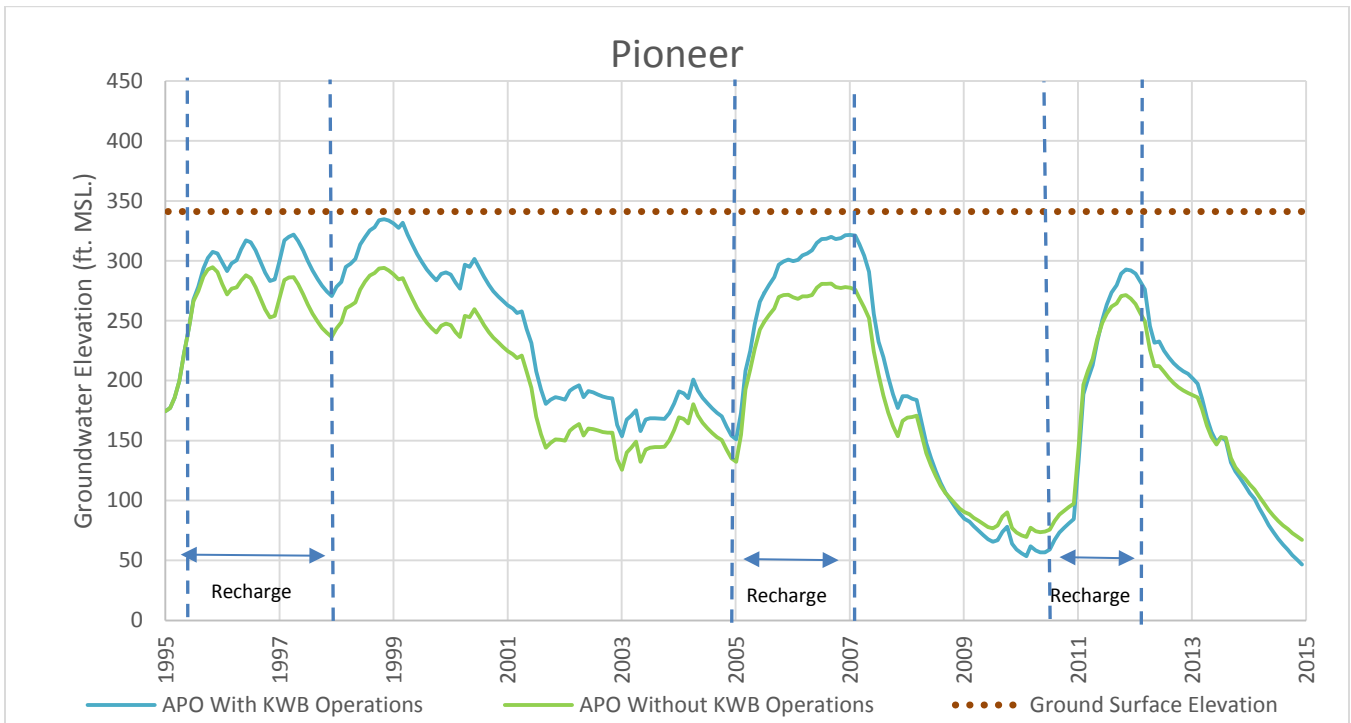


FIGURE 7.1-39b. Groundwater Elevation Hydrographs at Pioneer Recharge Pond for APO

- 2011 Recharge Operations – Water levels for 2011 recharge operations were significantly lower than the previous two recharge operations in 1995-1998 and 2005-2006 and groundwater levels did not reach the ground surface; thus, simultaneous operations of KWB and all other groundwater banks in the area were not expected to impact neighboring groundwater banks.

As summarized in the analysis above, KWB operations, in conjunction with the operations of other neighboring groundwater banks, under the APO scenario did not substantially interfere with recharge operations at neighboring groundwater banks due to high water table during the 1995-1998 recharge period.

Therefore, the impacts from KWB operations during 1995-2014 in terms of raising water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge at neighboring basins was ***less than significant***.

2015 – 2035 (Analysis of Future Operations – Existing Conditions)

Potential impacts of KWB recharge operations on the recharge operations of neighboring recharge facilities during high groundwater elevations were analyzed with all the groundwater banks operating simultaneously under AFO-EC recharge facilities. Figure 7.1-38 shows the locations of the selected water level hydrographs at the neighboring recharge facilities. Figure 7.1-40 shows the representative water level hydrographs at these locations. Table 7.1-9 shows the minimum depth to water under AFO-EC conditions at the four selected recharge facilities. The impact of the KWB recharge operations on the neighboring recharge facilities during high groundwater elevations with all the groundwater banks operating simultaneously are discussed below.

- 2016-2019 Recharge Operations – The water level analysis shows that at the adjacent recharge facilities, groundwater levels were lower than 63 feet below the ground surface; thus, the groundwater mounding associated with the simultaneous operations of KWB and all other neighboring groundwater banks would not interfere with recharge operations of neighboring basins.
- 2026-2027 Recharge Operations – The water levels at the adjacent recharge facilities were generally lower than 2016-2019 conditions and lower than 41 feet below the ground surface; thus, the groundwater mounding associated with simultaneous operations of KWB and all other neighboring groundwater banks would not interfere with recharge operations of neighboring basins.
- 2032 Recharge Operations – The water levels for 2032 recharge operations were significantly lower than the previous two recharge operations in 2016-2019 and 2026-2027 and groundwater levels were lower than 85 feet below the ground surface; thus, the groundwater mounding associated with simultaneous operations of KWB and all other neighboring groundwater banks are not expected to interfere with recharge operations of neighboring basins.

Groundwater levels rise during recharge operations; this rise in water tables would be the result of the mutual interactions of the KWB and the neighboring groundwater banks and not due to the operation of any single groundwater bank. As summarized in the analysis above, KWB operations, in conjunction with the operations of all other neighboring groundwater banks, under AFO-EC scenario could contribute to a resulting groundwater level of approximately 41 feet below the ground surface. This would not result in a significant interference with groundwater recharge.

Therefore, the impacts from KWB operations during 2015-2035 under AFO-EC scenario conditions in terms of raising water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge at neighboring basins would be ***less than significant***.

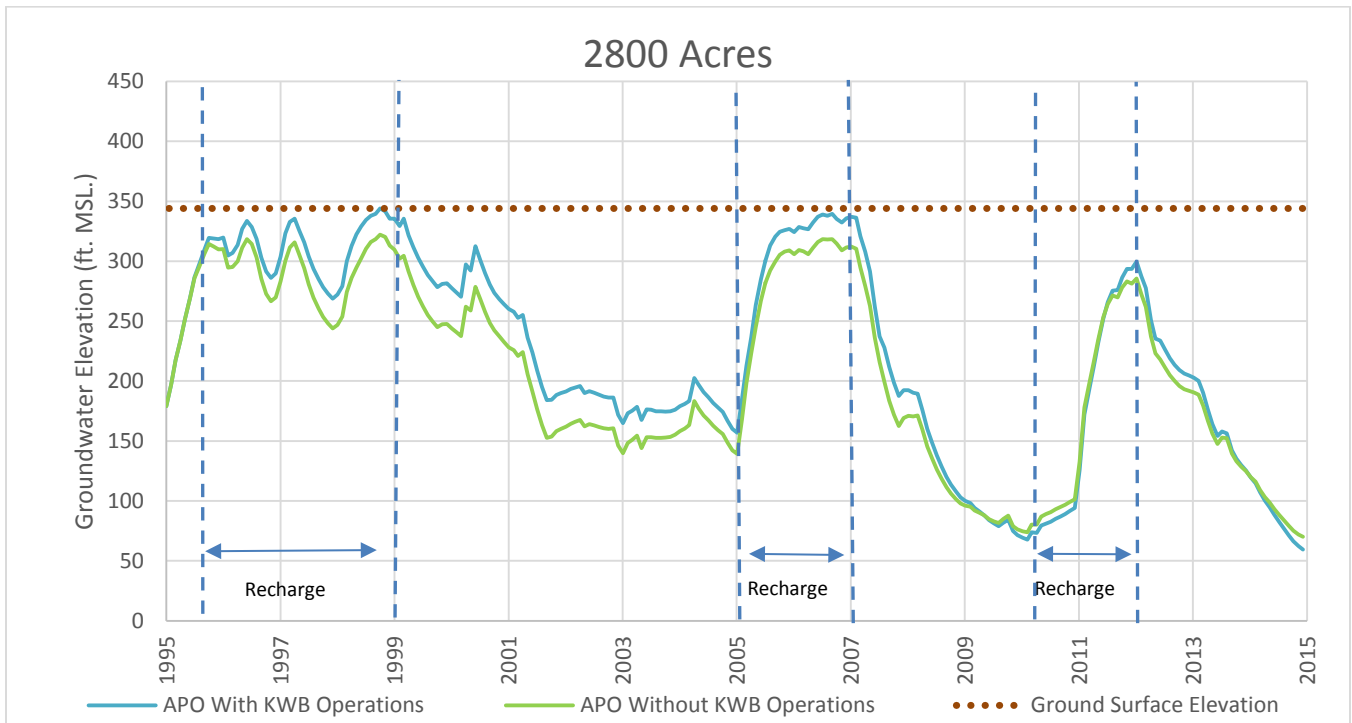


FIGURE 7.1-39c. Groundwater Elevation Hydrographs at 2800 Acres Recharge Pond for APO

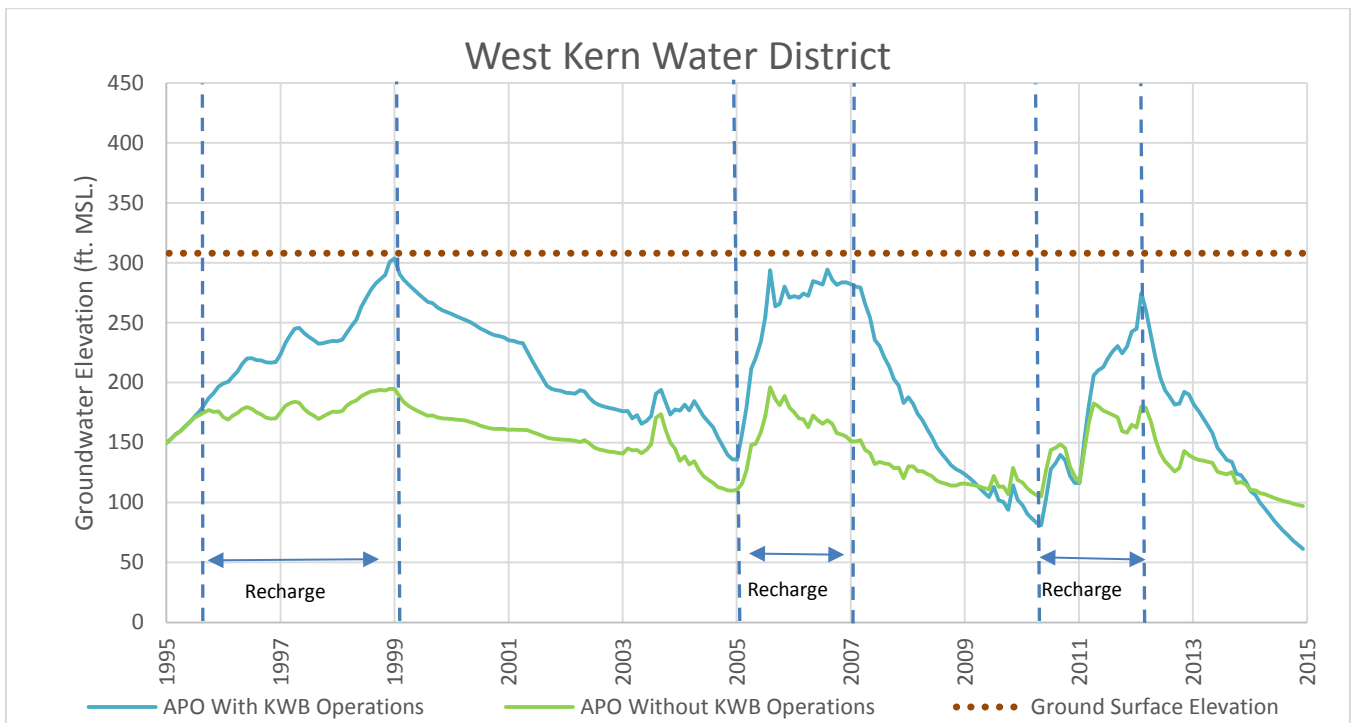


FIGURE 7.1-39d. Groundwater Elevation Hydrographs at West Kern Water District Recharge Pond for APO

TABLE 7.1-9				
MODEL-GENERATED MINIMUM DEPTH TO WATER FOR AFO-EC CONDITIONS				
Simulation Period	Recharge Facility			
	Rosedale	Pioneer	2800 Acre	West Kern WD
2016-2019	104.4	75.2	63.7	78.3
2026-2027	94.9	62.4	41.5	87
2032	105.6	88.7	85	99.1

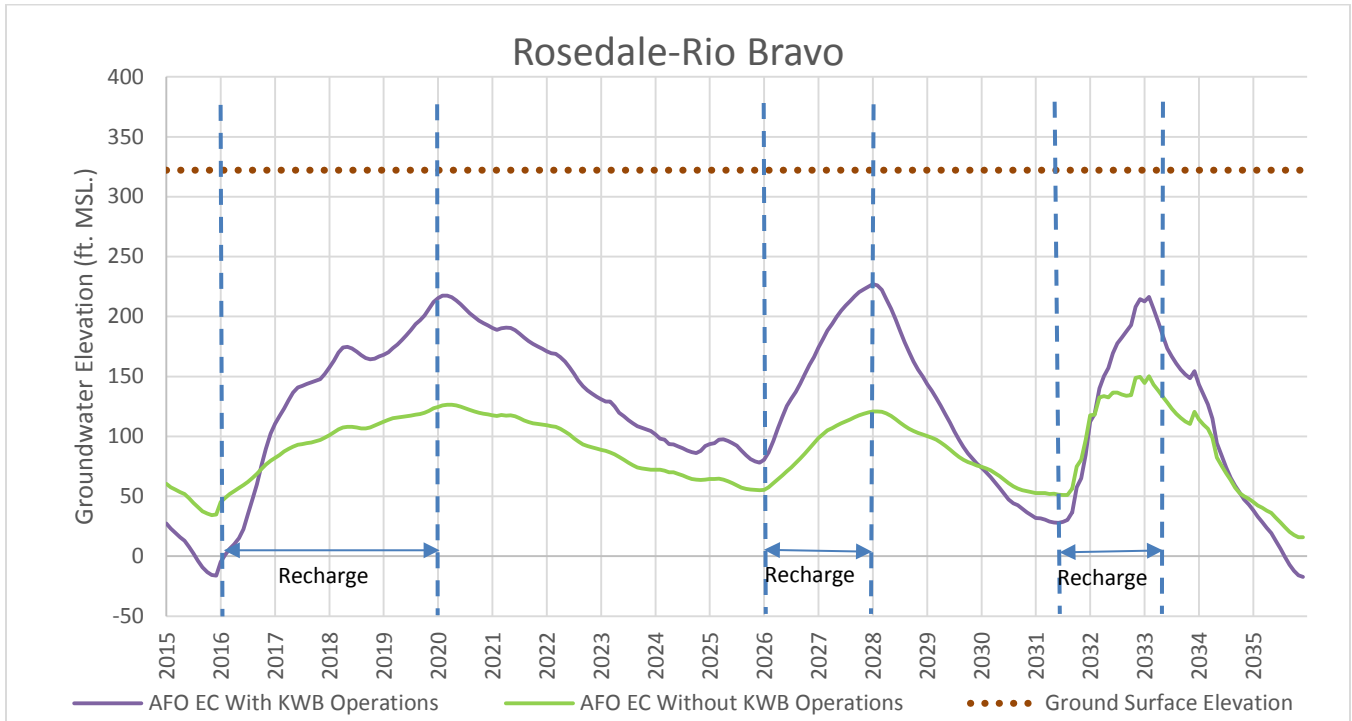


FIGURE 7.1-40a. Groundwater Elevation Hydrographs at Rosedale-Rio Bravo Recharge Pond for AFO-EC

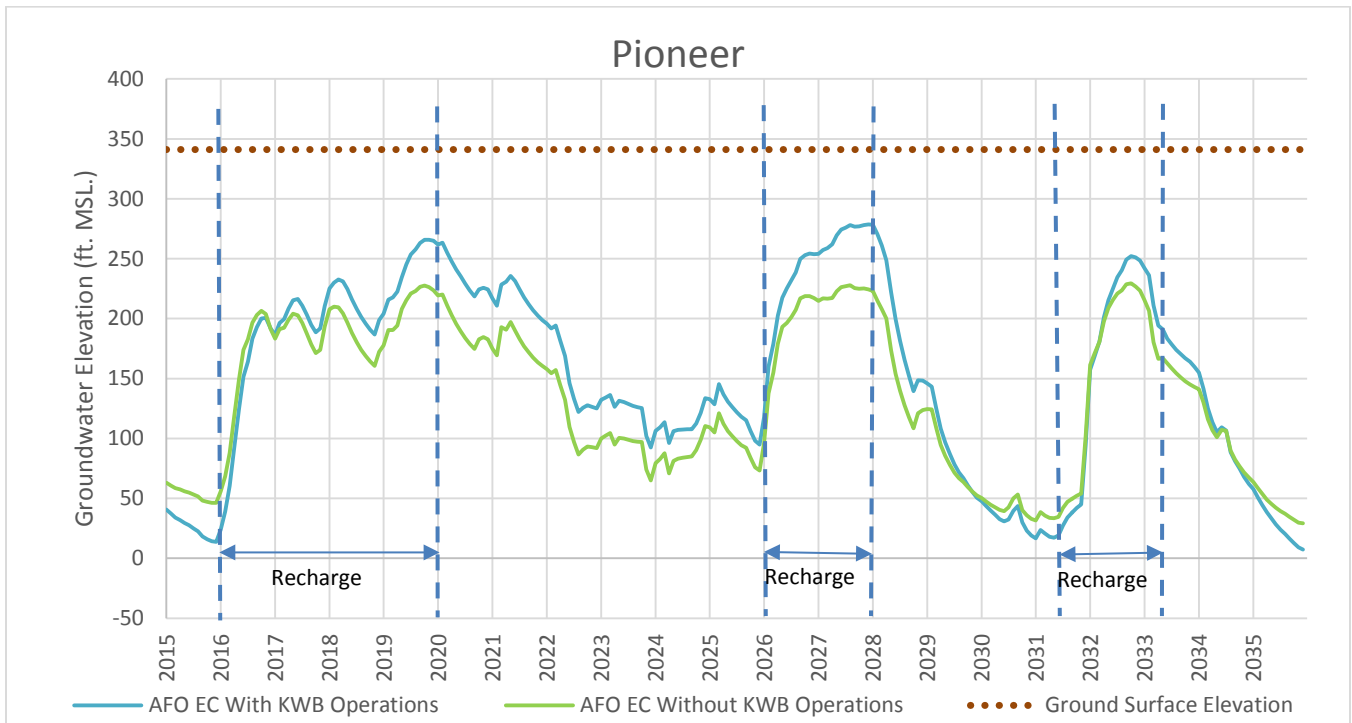


FIGURE 7.1-40b. Groundwater Elevation Hydrographs at Pioneer Recharge Pond for AFO-EC

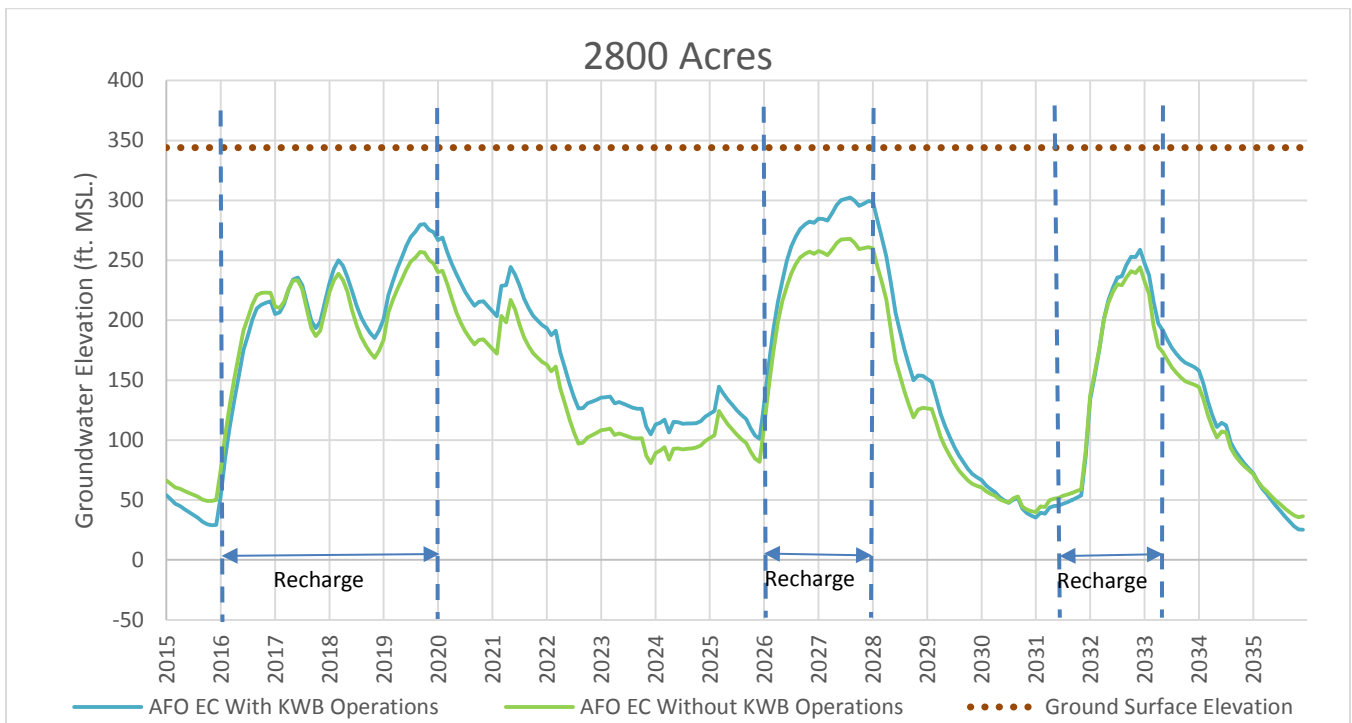


FIGURE 7.1-40c. Groundwater Elevation Hydrographs at 2800 Acres Recharge Pond for AFO-EC

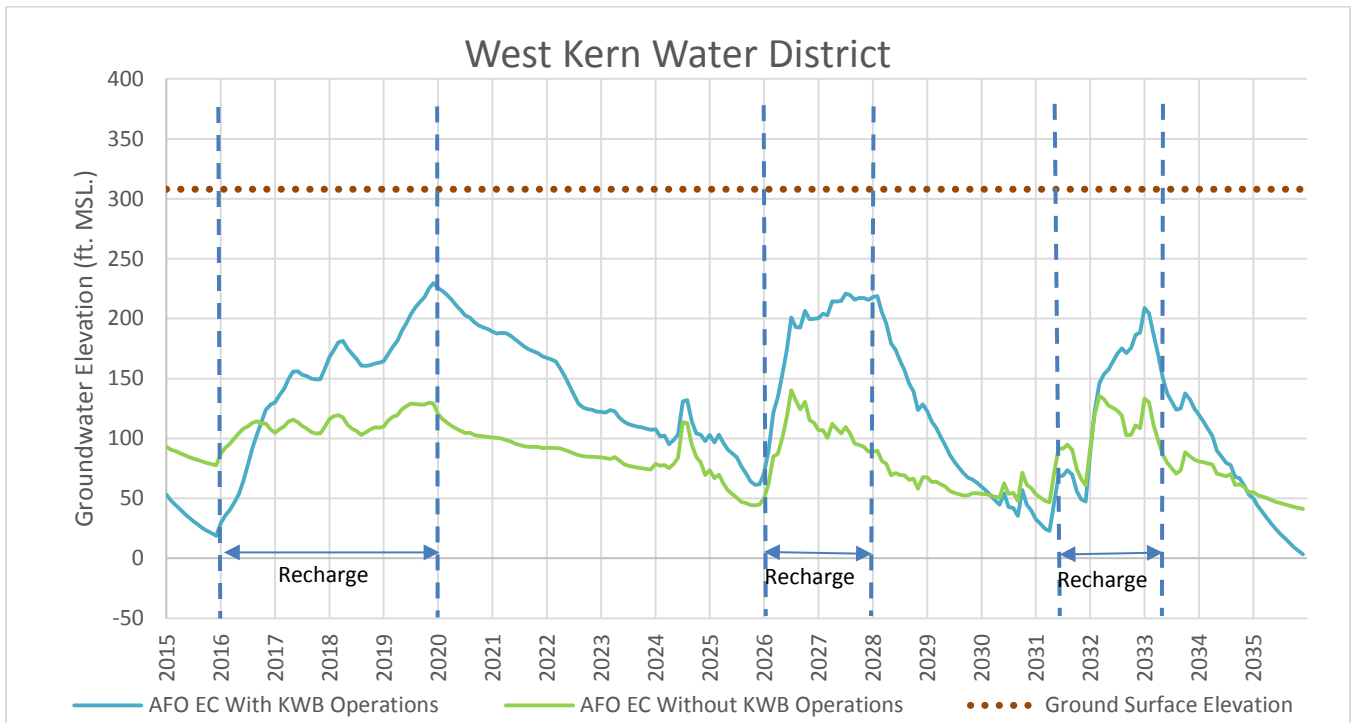


FIGURE 7.1-40d. Groundwater Elevation Hydrographs at West Kern Water District Recharge Pond for AFO-EC

Simulation Period	Recharge Facility			
	Rosedale	Pioneer	2800 Acre	West Kern WD
2016-2019	65	50.2	40.3	64.4
2026-2027	53.2	39.9	15.7	63.4
2032	65.7	67	48.9	86.9

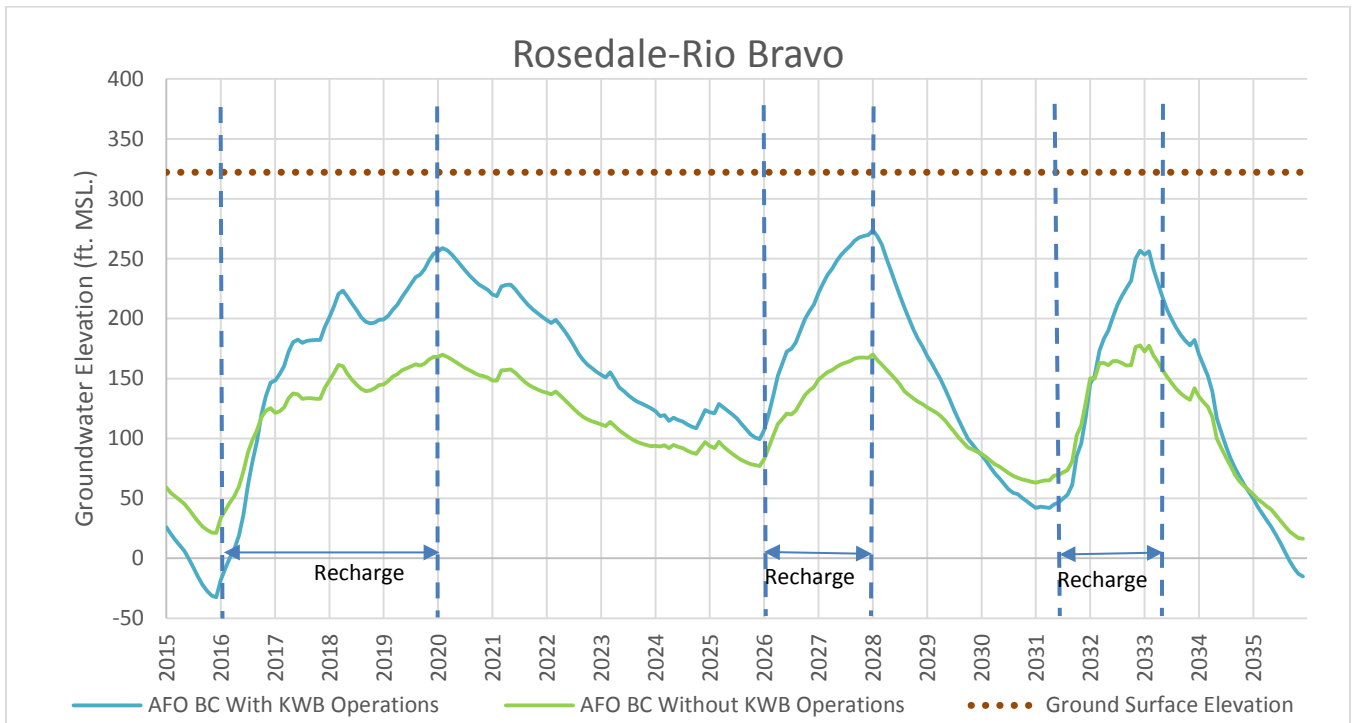


FIGURE 7.1-41a. Groundwater Elevation Hydrographs at Rosedale-Rio Bravo Recharge Pond for AFO-BC

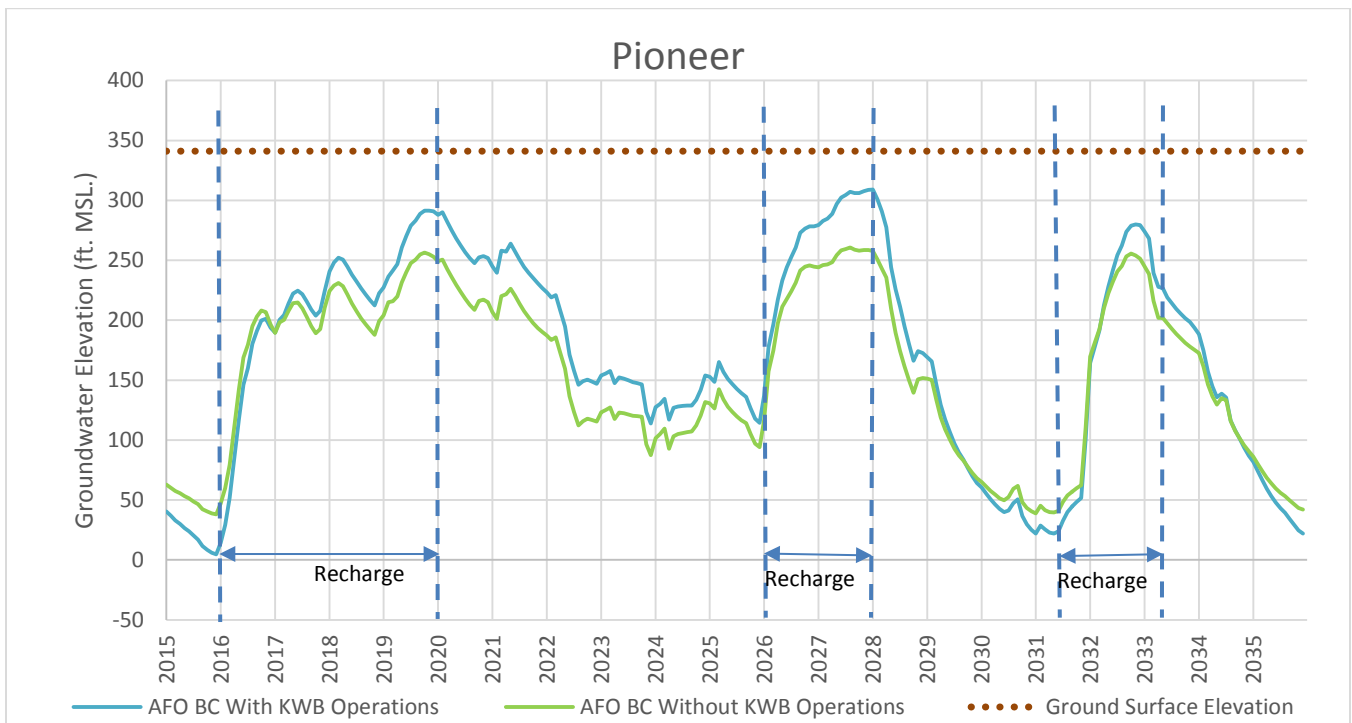


FIGURE 7.1-41b. Groundwater Elevation Hydrographs at Pioneer Recharge Pond for AFO-BC

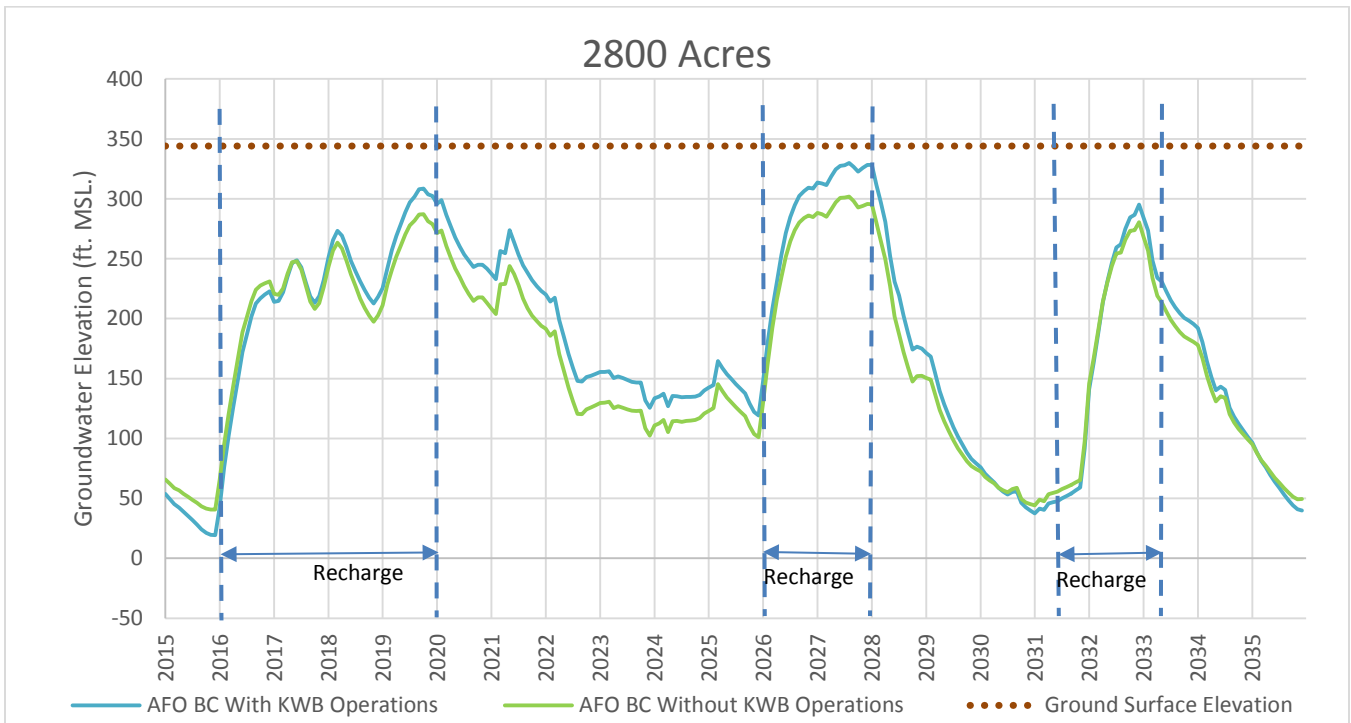


FIGURE 7.1-41c. Groundwater Elevation Hydrographs at 2800 Acres Recharge Pond for AFO-BC

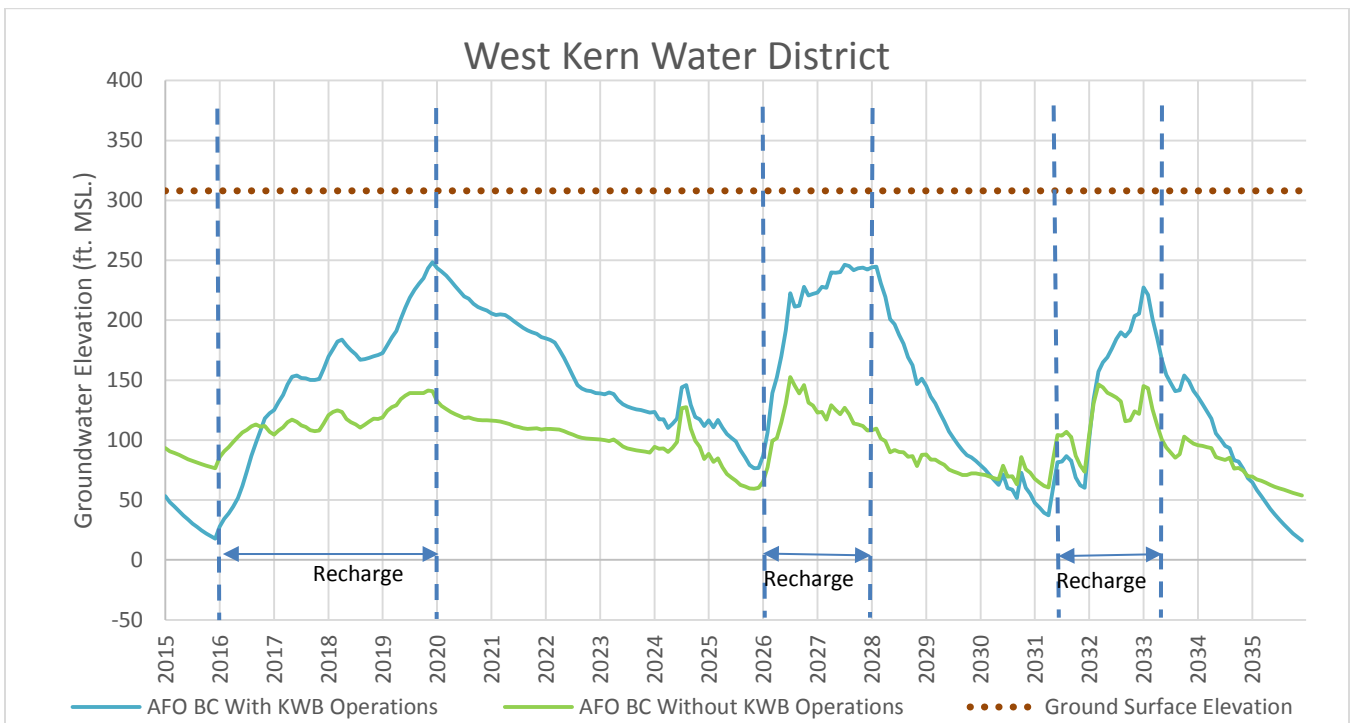


FIGURE 7.1-41d. Groundwater Elevation Hydrographs at West Kern Water District Recharge Pond for AFO-BC

Mitigation Measures

None required.

2015 – 2035 (Analysis of Future Operations – Build-out Conditions)

During recharge operations groundwater levels rise. The rise in water tables would be the result of the mutual interactions of the KWB and the neighboring groundwater banks and not due to the operation of any single groundwater bank. Impacts of KWB recharge operations on the recharge operations of neighboring recharge facilities were evaluated by using water level hydrographs at the neighboring recharge facilities. The evaluation showed a resulting groundwater level of approximately 16 feet below the ground surface. This would not result in a significant interference with groundwater recharge.

Therefore, the impacts from KWB operations during 2015-2035 under AFO-BC scenario conditions in terms of raising water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge at neighboring basins would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. Kern Water Bank Authority. 2015. *Kern River Alluvial Fan Groundwater Flow Model Report*. Prepared by Amec Foster Wheeler.
2. California Department of Water Resources. 2016. *Development of DWR Kern Water Bank Model: Model Review, Selection, and Enhancements*.
3. California Department of Water Resources. 2013. *The State Water Project Delivery Reliability Report 2013*. Bay-Delta Office, Sacramento, CA.
4. California Department of Water Resources. 2013. *The State Water Project Delivery Reliability Report 2013*. Bay-Delta Office, Sacramento, CA.
5. California Department of Water Resources. 2003. *California Groundwater*. Bulletin 118.
6. Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA. Pages 5 and 22–32.
7. Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA. Pages 5, 8, and 31–39.
8. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA. Pages 4, 7, and 23–28.
9. Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA. Pages 9 and 25.
10. Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA. Pages 7 and 25.
11. Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA. Pages 7 and 25.
12. U.S. Environmental Protection Agency website, <https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance- nuisance-chemicals#what-are-secondary>, accessed April 21, 2016.
13. U.S. Environmental Protection Agency website, <https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance- nuisance-chemicals#what-are-secondary>, accessed April 21, 2016.

7.2 SURFACE WATER AND GROUNDWATER QUALITY (NEW)

7.2 SURFACE WATER AND GROUNDWATER QUALITY (NEW)

7.2.1 INTRODUCTION

7.2.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Sections 7.1 and 7.2 identified potential impacts to surface water hydrology, water quality, and water supply, and groundwater hydrology and quality, respectively, as a result of the transfer of the Kern Fan Element. This section describes the potential impacts of KWB activities on surface water and groundwater water quality. It contains substantial new information developed specifically for this REIR. Consequently, this section replaces in their entirety those parts of DEIR Sections 7.1 and 7.2 relating to impacts of KWB activities on surface water and groundwater water quality.

In addition to the impacts discussed below, impacts of KWB activities on surface water and groundwater hydrology, including drainage modifications, alterations of groundwater levels and flow directions, and flood hazards, are analyzed in Section 7.1, Surface Water and Groundwater Hydrology.

Section 7.11, *Hazards and Hazardous Materials*, discusses hazards from past and present environmental contamination, pesticide use and residual agricultural chemicals, third-party oil and gas production, and other activities with the potential to release hazardous materials into the environment. Impacts related to construction-related erosion are analyzed in Section 7.9, *Geology, Soils, and Mineral Resources*.

7.2.1.2 Analytical Method

The geographic extent of the water quality analysis for the underlying groundwater aquifer extended beyond KWB Lands to the California Department of Water Resources (Department or DWR) Kern Water Bank Model (DWR KWB Model) boundaries as follows: northern edge, 6 miles; southern edge, 5.2 miles; eastern edge, 10 miles; and western edge, 7.7 miles. The analysis of impacts on local surface water quality includes the Kern River and associated channels and interties, and the following primary surface water conveyance facilities: California Aqueduct, Cross Valley Canal (CVC), and KWB Canal (Figures 7.2-1 and 7.2-2).

The following impacts were evaluated:

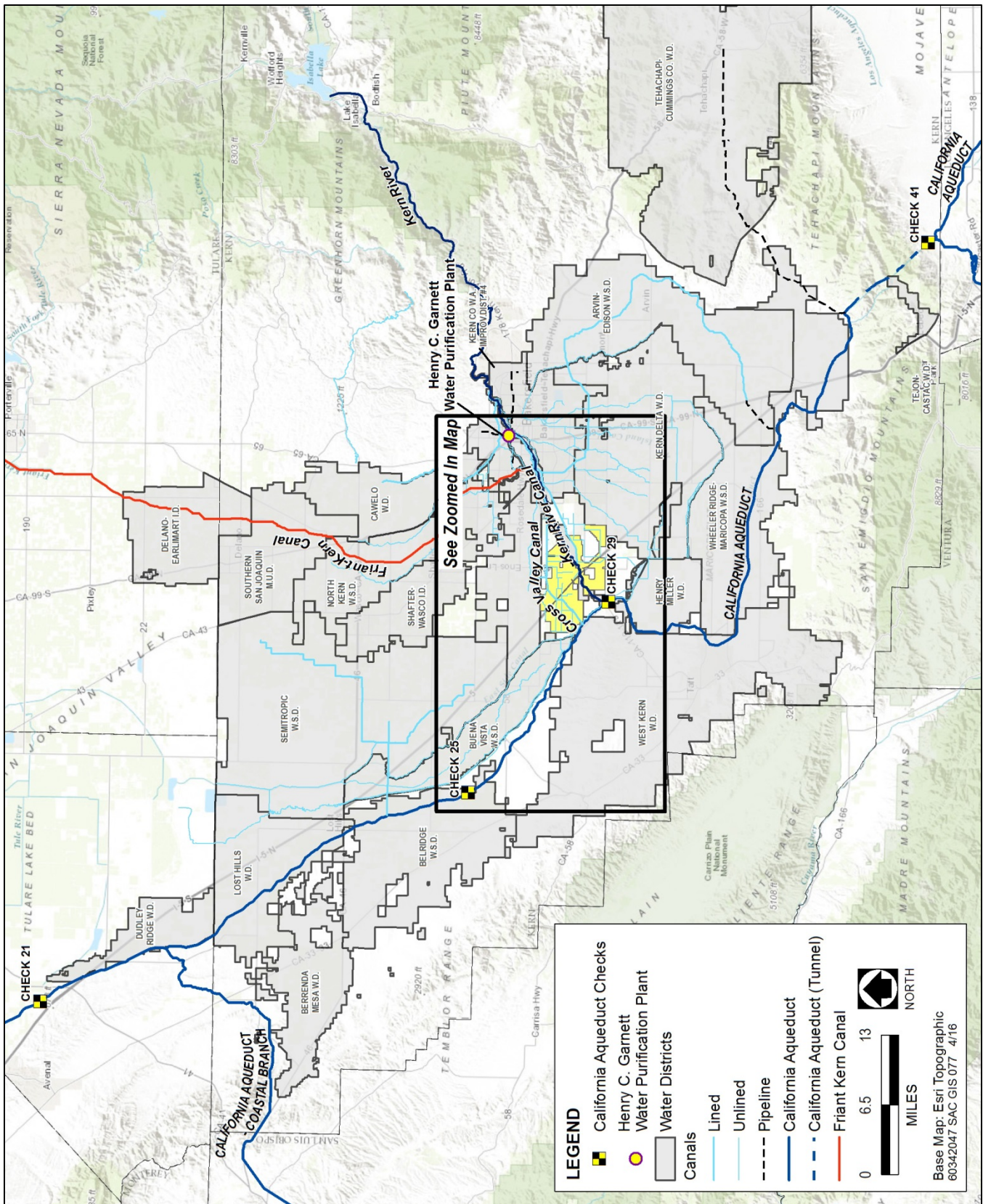
- construction and development of existing and future KWB facilities, as well as KWB continued use, operation, and maintenance (KWB activities);
- soil erosion, such as sediment transport into waterways during KWB activities;
- potential leaching of surface contamination to groundwater during KWB water recharge activities;
- water quality effects associated with recharging and recovering groundwater, including lateral and vertical migration of water quality constituents of concern (COC); and
- impacts on the water quality of drinking water supplies.

An assessment of water quality impacts was conducted in accordance with standard professional practices for EIRs. To examine the effects of KWB activities on surface water quality and groundwater quality, readily available historical water quality data were collected and analyzed. Water quality data for 1984–2015 were collected to identify possible water quality changes associated with KWB activities. A summary of the data collected for this analysis is presented in Appendix 7-3.

The COCs considered for the impact analysis were identified by the Kern Fan Monitoring Committee (KFMC) or recognized in the SWP Non-Project Water Acceptance Criteria, or both. These COCs were also included in the water quality objectives established in Article 19 of the long-term water supply contracts for SWP water, and for surface water quality objectives established in the *Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin* (Tulare Lake Basin Plan). The applicable water quality criteria for each of these COCs are presented in Tables 7.2-1, 7.2-2, and 7.2-3.

Water quality data published in the KFMC operations and monitoring reports were used in this groundwater quality impact analysis.^{1,2,3,4,5} Data sets used for the surface and groundwater quality analysis are presented in Appendix 7-3, and Table 7.3-1 in Appendix 7-3 includes a set of reference wells selected for this analysis which includes 121 wells (38 production or recovery wells and 83 monitoring wells). Additional KWB on- and off-site production and monitoring wells were also used to support aquifer zone specific and areal coverage, as needed.

The analysis was performed using data from the Kern County Water Agency (KCWA) groundwater quality monitoring database⁶, and the KCWA pump-in blending operations data set. The analysis compared database results for reference wells and COCs exceeding Maximum Contaminant Levels (MCLs).



Source: Source: KWBA

FIGURE 7.2-1. Surface Water Conveyance Facilities in Kern Water Bank Area

The impact analysis for groundwater quality considered three aquifer zones for presenting results: shallow, middle, and deep. The three zones are: (1) an approximately 100- to 200-foot thick shallow unconfined zone located less than 300 feet below ground surface [bgs]; (2) a 250-foot thick semiconfined middle zone, the main water-producing zone located approximately 300–550 feet bgs; and (3) an approximately 350-foot thick semiconfined zone located approximately 550–900 feet bgs. These thicknesses are generally consistent with KFMC definitions, which in turn are generally consistent with the layering used in the DWR KWB Model (see Appendix 7-2). Note that some of the reference wells are screened across multiple zones, in particular the production wells.

This water quality analysis also includes a review of the 1995 environmental setting, impacts, and mitigation measures related to water quality presented in the 1997 Monterey Initial Study (IS) and Addendum (see Appendix 7-6a), and KWB operational criteria specified in the 1995 Kern Water Bank Memorandum of Understanding (1995 KWB MOU), KWB Interim Operations Plan, and KWB Long-term Operations Plan (see Appendices 7-5a, 7-5b, and 7-5c, respectively).

7.2.1.3 Standards of Significance

The following standards of significance are based in part on Appendix G of the California Environmental Quality Act (CEQA) Guidelines and the 1995 KWB MOU. For the purposes of this REIR, a significant impact related to surface water quality or groundwater quality would occur if KWB activities would:

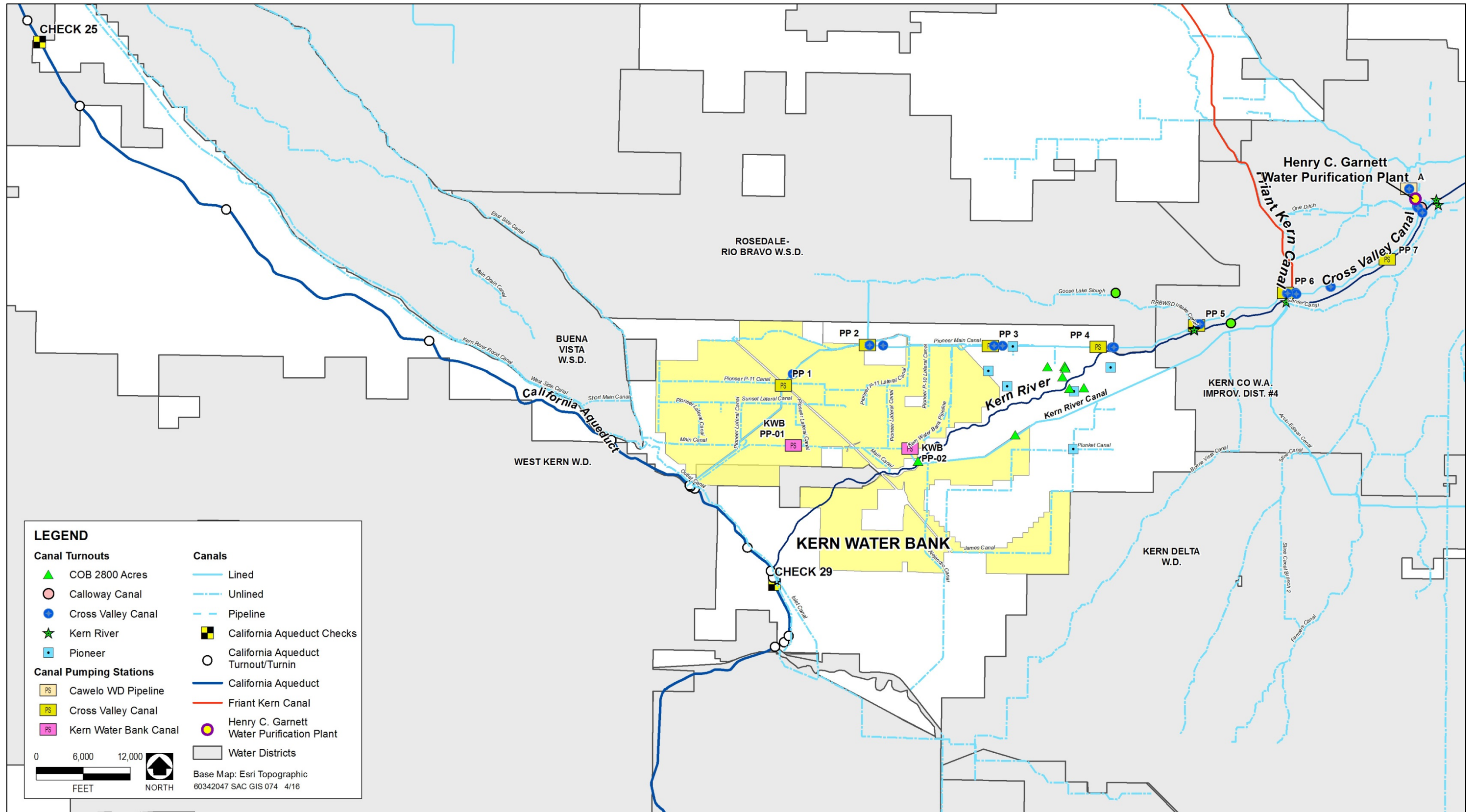
- substantially violate any water quality standards, policies, or waste discharge requirements (WDRs);
- create or contribute runoff water that would provide substantial additional sources of polluted runoff;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- substantially alter surface water quality in the California Aqueduct such that the Department's Non-Project Water Acceptance Criteria are not met;
- result in the substantial migration of areas of poor-quality groundwater within the underlying aquifer or mobilize surface contamination into an uncontaminated groundwater supply; or otherwise substantially degrade water quality or water supplies.

Substantial changes are defined as changes beyond those normally observed in historical records, and that are disproportionate to any documented information on surface water or groundwater in the basin. Poor water quality is defined as water that does not meet California Code of Regulations (CCR) Title 22 standards (see Table 7.2-1).

7.2.2 ENVIRONMENTAL SETTING

7.2.2.1 Physical Setting in 1995

The physical setting in 1995 is presented to provide background conditions at the start of KWB operations.



Source: KWBA

FIGURE 7.2-2. Surface Water Conveyance Facilities at the Kern Water Bank

TABLE 7.2-1

MAXIMUM CONTAMINANT LEVELS FOR SELECT CONSTITUENTS

Constituent of Concern	California Maximum Contaminant Level ¹	Detection Limit for Reporting	Reporting Units
Arsenic	10	2	µg/L
Barium (Ba)	1000	100	µg/L
Benzene	1	0.5	µg/L
Cadmium (Cd)	5	1	µg/L
Chlordane	0.1	0.1	µg/L
Chloride	250 ²		mg/L
Chromium (Total Cr)	50	10	µg/L
Chromium, hexavalent (Cr VI)	10	1	µg/L
Color, Apparent (Unfiltered)	15 ²		color units
Combined Ra 226 + Ra 228	5		pCi/L
Di(2-ethylhexyl)phthalate (DEHP)	0.004	0.003	mg/L
Dibromochloropropane (DBCP)	0.2	0.01	µg/L
Ethylene Dibromide (EDB)	0.05	0.02	µg/L
Fluoride (F) (Natural-Source)	2	0.1	mg/L
Foaming Agents (MBAS)	0.5 ²		mg/L
Iron (Fe)	300 ²	100	µg/L
Alpha	15	3	pCi/L
Manganese (Mn)	50 ²	20	µg/L
Methyl tert-Butyl Ether (MTBE)	13/5 ²	3	µg/L
Nitrate (as NO ₃)	45	2	mg/L
Nitrate + Nitrite as Nitrogen (N)	10000	400	µg/L
Nitrite as Nitrogen (N)	1000	400	µg/L
Odor Threshold @ 60 C	3 ²	1	TON
Simazine (PRINCEP)	4	1	µg/L
Specific Conductance (E.C.)	900 ²		µmhos
Sulfate (SO ₄)	250 ²	0.5	mg/L
Toluene	150	0.5	µg/L
Total 1,3-Dichloropropene	0.5	0.5	µg/L
Total Filterable Residue @ 180 C (TDS)	500 ²		mg/L
Toxaphene	3	1	µg/L
Turbidity, Laboratory	5	0.1	NTU
Uranium	20	1	pCi/L

Notes:

µmhos = micromhos; µg/L = micrograms per liter; pCi/L = picocuries per liter; mg/L = milligrams per liter; NTU = nephelometric turbidity unit; TON = threshold odor number

1. All MCLs are primary for drinking water unless noted otherwise. Primary MCLs are based on human health protection, while secondary MCLs are based on human welfare considerations (e.g., taste, odor, laundry staining).

2. Secondary MCL value shown is recommended consumer acceptance contaminant level.

Source: Regional Water Quality Control Board drinking water standards website, 2015.7

TABLE 7.2-2

**STATE WATER PROJECT WATER QUALITY OBJECTIVES
FOR THE CALIFORNIA AQUEDUCT**

Constituent of Concern	Unit	Monthly Average	Average for any 10-year Period	Maximum
Total Dissolved Solids	ppm	440	220	
Total Hardness	ppm	180	110	
Chlorides	ppm	110	55	
Sulfates	ppm	110	20	
Boron	ppm	0.6		
Sodium Percentage	%	50	40	
Fluoride	ppm			1.5
Lead	ppm			0.1
Selenium	ppm			0.05
Hexavalent Chromium	ppm			0.05
Arsenic	ppm			0.05
Iron and Manganese together	ppm			0.3
Magnesium	ppm			125
Copper	ppm			3.0
Zinc	ppm			15
Phenol	ppm			0.001

Note:
ppm = parts per million
Source: California Department of Water Resources, Water Supply Contract Between the California Department of Water Resources and Kern County Water Agency, November 15, 1963

TABLE 7.2-3

**STATE WATER PROJECT PUMP-IN CRITERIA FOR NON-PROJECT WATER
IN THE CALIFORNIA AQUEDUCT**

Metals, Minerals, and Others	2001 Policy Criteria Mean Concentrations, mg/L (1988 - 2001 ¹)	2012 Policy Criteria ^{2,3} Mean Concentrations, mg/L (1988 - 2011)
Aluminum	0.029	0.03
Antimony	0.005 ⁴	0.002
Arsenic	0.002	0.002
Barium	0.050 ⁴	0.05
Beryllium	0.001	0.001 ⁴
Bromide	0.21	0.22 ² ; (0.10-0.41) ³
Cadmium	0.004	0.003
Chromium	0.005 ⁴	0.004
Copper	0.005	0.004
Fluoride	0.09	0.1
Iron	0.049	0.037
Manganese	0.007	0.009
Mercury	0.0008	0.001
Nickel	0.002	0.001
Nitrate	3.5	2.9
Nitrate-Nitrite	0.6	NA
Nitrite	0.5	NA
Salinity (Specific conductance)	299-756 ^{3,5}	NA
Selenium	0.001 ⁴	0.001
Silver	0.004	0.003
Sulfate	43	42
Total Organic Carbon	4	4.0 ² (2.7-7.0) ³

TABLE 7.2-3

**STATE WATER PROJECT PUMP-IN CRITERIA FOR NON-PROJECT WATER
IN THE CALIFORNIA AQUEDUCT**

Metals, Minerals, and Others	2001 Policy Criteria Mean Concentrations, mg/L (1988 - 2001¹)	2012 Policy Criteria^{2,3} Mean Concentrations, mg/L (1988 - 2011)
Total Dissolved Solids	NA	157.3-372.9 ³
Zinc	0.009	0.007

Notes:

mg/L = milligrams per liter; NA – not applicable

1. Historical water quality conditions during 1988-2001 at O'Neill Forebay Outlet (mg/L)
2. Historical water quality conditions during 1988-2011 at O'Neill Forebay Outlet (mg/L)
3. Criteria are variable based on monthly averages for water year classifications: Wet, Near Normal (combined above and below normal), Dry and Critical.
4. These values represent reporting limits; actual values would be lower.
5. Historical salinity concentrations during 1979-2000 at O'Neill Forebay Outlet (us/cm)

Pesticides, herbicides, and synthetic organic chemicals are not detected in water samples at this location. Therefore, historical conditions are considered to be represented by less than detection levels for these compounds.

Source: California Department of Water Resources. 2001 and 2012 *Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project*

Surface Water Sources

Major surface water sources and conveyance features in the vicinity of the KWB include the SWP's California Aqueduct, the Friant-Kern Canal, the Kern River, CVC, and the KWB Canal (see Figures 7.2-1 and 7.2-2). The three main sources of surface water banked at the KWB are the SWP's California Aqueduct, the CVP's Friant-Kern Canal, and the Kern River.

The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. A main feature of the SWP is the California Aqueduct, which conveys water from the Sacramento-San Joaquin Delta (Delta) to San Luis Reservoir and O'Neill Forebay and subsequently south to Central and Southern California. The California Aqueduct provides SWP water to the KWB. In addition, recovered water from KWB banking activities is pumped into the California Aqueduct for water banking participants. The KWB Canal and the CVC transport water from the California Aqueduct to the KWB and other neighboring water banking projects. The KWB Canal and the CVC conveys recovered water to be pumped back into the California Aqueduct.

The CVP, operated by the U.S. Bureau of Reclamation (Reclamation), is one of the world's largest water storage and transport systems. The Friant-Kern Canal carries water from Millerton Lake to its terminus at the Kern River, 4 miles west of Bakersfield. The water serves Fresno, Tulare, and Kern Counties. The canal has an initial capacity of 5,000 cubic feet per second (cfs) that gradually decreases to 2,000 cfs at its terminus in the Kern River. CVP Friant Division water is provided to the KWB via the Friant-Kern Canal and other interconnecting canals.

The Kern River is one of the primary river courses in the southern portion of the Central Valley of California. The Kern River watershed extends high into the southern Sierra Nevada and drains roughly 2,400 square miles above the City of Bakersfield. Lake Isabella, which is formed by Lake Isabella Dam, is the main storage reservoir on the Kern River and is located approximately 35 miles northeast of the City of Bakersfield. The primary purpose of the dam and reservoir is to provide flood control. Lake Isabella also provides water for irrigation in the valley, which is diverted for consumption or groundwater recharge from the Kern River via numerous conveyance and diversion canals along the river. The Kern River experiences a high degree of annual and seasonal hydrologic variability, and flows are influenced by Lake Isabella operations and diversions. During certain times of the year, the Kern River may be dry

on and near KWB Lands. During high flow times, Kern River flows are conveyed to the Aqueduct at the Kern River Intertie located in Pool 29, which is above Check 29 at milepost 241.02.

There are many canals that distribute water throughout KWB Lands. The CVC conveys water from the California Aqueduct eastward for agricultural purposes, recharge, and to Improvement District No. 4 (ID4) and westward for groundwater recharge and recovery. The CVC's intertie with the California Aqueduct is located just upstream of Check 29.

Surface Water Quality

California Aqueduct

Table 7.2-4 summarizes the average concentrations of COCs from samples collected from the Aqueduct during 1995 at three checks located upstream (Check 21) and downstream from the vicinity of KWB (Checks 29 and 41) (see Figure 7.2-2 for locations). These data are from the monthly sampling program as reported in the Department's online water quality database.⁸

Concentrations of TDS in the Aqueduct are typically variable due to variations in Delta water quality as well as changes in pump-in and pump-out activities. The Department's objective for TDS is to not exceed a monthly average of 440 milligrams/liter (mg/L) (Table 7.2-4).

In 1995, background concentrations of arsenic, chloride, dissolved chromium, dissolved organic carbon, and sulfate in the Aqueduct at all three checks were below the relevant MCLs for these constituents. No sampling analyses are available for nitrate, nitrite, or uranium.

Station	Dissolved Arsenic	Dissolved Bromide	Dissolved Chloride	Dissolved Chromium	Dissolved Organic Carbon	Dissolved Nitrate	Dissolved Sulfate	Total Dissolved Solids	Uranium
Check 21									
Avg	0.002	0.15	48	<0.005	NS	NS	69	273	NS
Min	0.001	0.08	25	<0.005	NS	NS	25	139	NS
Max	0.002	0.25	109	<0.005	NS	NS	364	722	NS
Check 29									
Avg	0.002	NS	50	<0.005	NS	NS	51	239	NS
Min	0.001	NS	25	<0.005	NS	NS	24	141	NS
Max	0.003	NS	103	<0.005	NS	NS	107	417	NS
Check 41									
Avg	0.002	0.14	46	<0.005	0.1	NS	46	226	NS
Min	0.001	0.04	15	<0.005	NS	NS	18	103	NS
Max	0.003	0.32	97	<0.005	NS	NS	98	404	NS
Notes: Data are in milligrams per liter (mg/L) NS = No Sample Source: DWR (2015)									

Friant-Kern Canal

Water in the Friant-Kern Canal is considered to be of high quality because the water originates as snowmelt from the Sierra Nevada; however, similar to the California Aqueduct, non-CVP project water is pumped into the Friant-Kern Canal before it reaches the CVC and its terminus at the Kern River channel. Reclamation regulates water quality within the Friant Division through the *Baseline Water Quality Report for CVP*. All wells that participate in the Friant-Kern Canal Groundwater Pump-in Program are required to meet Reclamation's water quality requirements established in Reclamation's *Policy for Accepting Non-Project Water into the Friant-Kern and Madera Canals*.⁹

The KCWA Water Purification Plant (WPP) collects samples from the Friant-Kern Canal for water quality analysis annually to fulfill CCR Title 22 sampling and annual reporting requirements.

Kern River

Surface water in the Kern River is generally good quality; concentrations of arsenic, chloride, dissolved chromium, dissolved organic carbon, and sulfate are below the relevant MCLs for these constituents.¹⁰ The KCWA WPP collects samples from the Kern River for water quality analysis annually to fulfill CCR Title 22 sampling and annual reporting requirements.

Groundwater Source

The KFE property is part of the Kern County Subbasin of the Tulare Lake hydrologic basin which comprises the southern half of the San Joaquin Valley bounded on the west by marine layers of the Coast Ranges and the east and south the by the Sierra Nevada, Tehachapi, and San Emigdios Mountains. The basin consists of deep depositional centers separated by a basement high near KWB Lands known as the Bakersfield Arch, located generally along the Kern River. Overlying the marine sedimentary rocks in the basin is a thick sequence of continental rocks and semi-consolidated to consolidated sediments. The Tulare Formation in the Coast Ranges to the west dips eastward under the alluvium in the KWB area and interfingers with the upper portion of the Kern River Formation in the subsurface. The upper portion of these formations and the overlying alluvium constitute the KWB, the developed part of which goes to depths of 700 to 900 feet bgs.

The hydrogeology as well as the groundwater at the KWB is dominated by the Kern River Fan, a large composite alluvial fan extending across the southern San Joaquin Valley from near Bakersfield to the Elk Hills. The hydrogeology in the western part of the KWB area contains material derived from marine sedimentary rock sources representing alluvial fan development with materials eroded from the Elk Hills. Local groundwater is also influenced by the Kern River as well as recent recharge water from the KWB. This recharge water displaces and mixes with local groundwater as it shifts back and forth in the groundwater system through variable recharge and recovery (pumping) conditions.

In general, east side source area rocks and sediments yield groundwater that exhibits lower TDS (100-300 mg/L) with major cations that include calcium (Ca) and magnesium (Mg), and the major anion hydrogen carbonate (HCO_3). West side source area rocks and sediments generally yield TDS up to several 1,000 mg/L with major cations including calcium and sodium (Na) and major anions including sulfate (SO_4) and chloride (CL). Between the eastside and west side groundwater, a more variable water type is found that is influenced by infiltration of excess irrigation or recharge activities and is generally higher in anions like sodium rather than cations like calcium.

Groundwater Quality

Groundwater quality in the vicinity of the KFE property was investigated by DWR in the late 1980s and early 1990s to establish generalized water quality and identify any areas of known and potential water

quality concerns.^{11,12,13} Early groundwater quality investigations were performed for standard minerals and minor elements, volatile organics, selected pesticides, and radiological parameters.

Of the constituents sampled in wells located on the KFE property, concentrations of TDS, sulfate, chloride, arsenic, boron, barium, and alpha/uranium were detected at concentrations above respective MCLs.^{14,15,16} Elevated and/or detected concentrations of nitrate, petroleum hydrocarbons, and pesticides were also observed.^{17,18,19,20} Additional data from 1990 to 1995 obtained from KCWA indicate that electrical conductance, an indicator of salinity and TDS, also had a seemingly widespread exceedance of the MCL across the KFE property.²¹ Sampling data also indicated isolated exceedances of primary or secondary MCLs for benzene, cadmium, iron, manganese, EDB, and toxaphene.²²

Areas of Water Quality Concern (1995)

KFMC previously delineated areas of elevated levels of total dissolved solids (TDS), fluoride, arsenic, ethylene dibromide (EDB), nitrate as NO₃, uranium, and dibromochloropropane (DBCP) on maps using historical data from approximately 1995 (Figure 7.2-3).²³

Figure 7.2-3 depicts areas of water quality concern for selected constituents in the KWB region. The source of this figure is the Kern Water Bank Groundwater Monitoring Report from 1991 to 1993.⁴³ The majority of samples were from the shallow aquifer with the exception of arsenic and fluoride. COCs are discussed in the context of MCLs. A general discussion of areas of groundwater quality concern as shown on Figure 7.2-3 is summarized below and in Appendix 7.3.

Total Dissolved Solids: TDS is made up of inorganic salts as well as a small amount of organic matter. Common inorganic salts that can be found in water include cations (calcium, magnesium, potassium, and sodium) and anions (carbonates, nitrates, bicarbonates, chlorides, fluoride, and sulfates). In 1995, on the KFE property, concentrations were generally lower than the CCR Title 22 contaminant level of 500 mg/L MCL; however, there were several small areas that had concentrations exceeding 500 mg/L in an area located just east of the Elk Hills (near Tupman) with scattered areas in the northern and eastern part of the KFE property.

Fluoride: An area exceeding 1.4 mg/L was located south to southeast of the KFE property extending east and west of Interstate 5 (I-5).

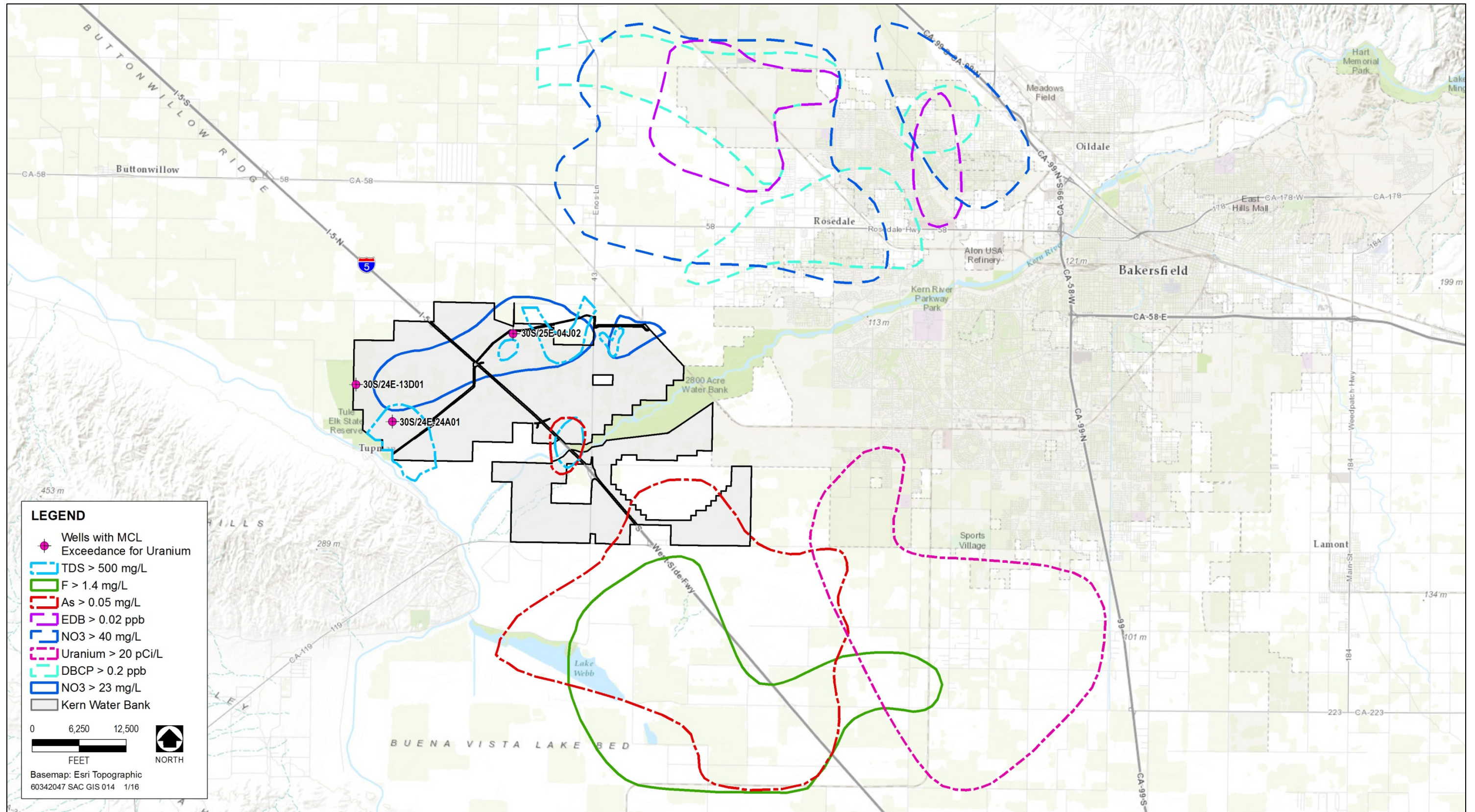
Total Arsenic: Areas exceeding 0.05 mg/L (i.e., 50 µg/L) were located along I-5 between the north and south portions of the KFE property (small area) with a larger area extending east and west of I-5 from the southern part of the KFE property southward.

EDB: 1,2-dibromo-3-chloropropane (EDB) areas of concern exceeding 0.02 µg/L were located northeast but well outside of the KFE property.

Nitrate as NO₃: Nitrate was not found above the MCL of 45 mg/L.

Uranium: Areas exceeding 20 pCi/L were located east-southeast of the KFE property.

DBCP: 1,2-Dibromo-3-chloropropane (DBCP) areas of concern exceeding 0.2 µg/L were located several miles to the northeast of the KFE property (but not within the KFE property).



Sources: DWR KFE Feasibility Study 1990 and Kern Water Bank Groundwater Monitoring Report 1991-1995²⁴

Figure 7.2-3 Areas of Groundwater Quality Concern, 1995 and Prior, in the Kern Fan Area

7.2.2.2 Changes in Physical Setting from 1996 through 2014

Surface Water Quality

California Aqueduct

Table 7.2-5 summarizes the concentration range for COCs in water supplies recharged on KWB Lands from 1996 through 2014 for the three main surface water sources for KWB recharge.²⁵ The table also summarizes associated MCLs and drinking water standards.

Water Source	Arsenic (ppb)	Bromide (ppb)	Total Chromium (ppb)	Chromium 6 (ppb)	Nitrate (ppm)	TDS (ppm)	DOC (ppm)	Sulfate (ppm)	Uranium (pCi/L)
California Aqueduct at Check 29	1-3	30-400	1-2	NS	0.4-4.2	92-269	NS	15-45	3.9-4.6
Friant-Kern Canal at KCWA WPP Pumping Plant	<2.0	<50	<2	<0.1	<0.4	20	3.2	2	0.4
Kern River at KCWA WPP Pumping Plant	3.0-4.6	64-100	<1	<0.1	<0.4	69-100	2.4-4.1	7.03-11	1.4-3.4
MCL ¹	10	NA	50	10	45	1000	NS	250	20
NL ²	NA	1000	NA	NA	2	NS	NS	NS	NS
DLR ³	2	NA	10	1	NA	NS	NS	NS	1

Notes:
 ppm = parts per million; ppb = parts per billion; pCi/L = picocuries per liter; KCWA = Kern County Water Agency; WPP = water purification plant; NA = not applicable; NS = no standard set
 1. MCL = Maximum contaminant level set by the State Water Resources Control Board Division of Drinking Water (SWRCB-DDW) as of March 3, 2015.
 2. NL = Notification level set by the SWRCB-DDW as of February 4, 2015.
 3. DLR = Detection limit for purposes of reporting set by the SWRCB-DDW as of March 3, 2015.
 Source: Kern County Water Agency, 2015 KCWA Groundwater Quality Database

Table 7.2-6 compares COCs at upstream and downstream locations in the Aqueduct during wet and dry years. During wet years, surface water is diverted to the groundwater recharge facilities. During dry years, recovered groundwater is discharged to the Aqueduct.

Friant-Kern Canal

Water quality of the various local water supplies (i.e., SWP, CVC, Friant-Kern Canal, Kern River, and groundwater recovery) differs, so conveyance agreements, such as the CVC Operating Agreement, provide certain water quality protections. TDS or electrical conductivity (EC) is used as an indicator of salts.

The Henry C. Garnet Water Purification Plant, operated by ID4, samples water quality for the Kern River, the Friant-Kern Canal, and the SWP to fulfill CCR Title 22 sampling requirements. Table 7.2-5 summarizes the concentration range of constituents of concern (COCs) in these recharge water supplies.²⁶

TABLE 7.2-6								
COMPARISON OF WATER QUALITY CONSTITUENTS OF CONCERN IN THE CALIFORNIA AQUEDUCT								
Station	Arsenic	Bromide	Chloride	Chromium	Total Organic Carbon	Nitrate as NO ₃	Sulfate	Total Dissolved Solids
Recharge 2006; 2011								
Check 21								
Min	0.001	0.05	18	0.001	0.8	0.5	15	107
Max	0.003	0.24	82	0.002	5.7	4.4	45	290
Avg	0.001	0.11	36	0.001	3.2	2.3	26	167
Check 29								
Min	0.001	0.103	16	0.001	0.9	0.4	12	92
Max	0.003	0.40	80	0.002	5.7	4.2	45	269
Avg	0.002	0.11	33	0.001	3.3	2.1	24	156
Check 41								
Min	0.001	0.03	12	0.001	1.1	0.6	10	101
Max	0.003	0.22	81	0.003	5.0	4.5	47	281
Avg	0.001	0.10	33	0.001	3.3	2.3	2.5	158
Recovery 2008; 2014								
Check 21								
Min	0.001	0.19	69	0.002	2.3	0.2	33	279
Max	0.004	0.44	134	0.003	6.4	6.9	137	470
Avg	0.003	0.33	101	0.002	4.1	1.9	57	351
Check 29								
Min	0.002	0.18	41	0.001	0.6	0.4	32	231
Max	0.008	0.37	106	0.003	6.0	7.5	121	434
Avg	0.005	0.26	76	0.001	2.5	4.2	54	300
Check 41								
Min	0.003	0.18	41	0.001	0.8	101	40	261
Max	0.008	0.37	101	0.005	6.0	16.0	101	340
Avg	0.005	0.25	72	0.002	2.5	5.2	58	298
Notes: Data in milligrams/liter (mg/L) ND = Not detected Source: KCWA (2015)								

Kern River

Surface water quality in the Kern River, its tributaries, and streams from the Caliente Creek watershed is generally good. Concentrations of COCs in the lower Kern River were well below MCLs (see Table 7.2-5). Streams on the east side of the Tulare Lake Hydrologic Region generally exhibit excellent water quality.²⁷

Groundwater Quality (1996 to 2014)

Following the transfer of the KFE property, a Kern Water Bank Groundwater Quality Monitoring Program was established in accordance with the 1995 KWB MOU and the Department's policy requirements for the introduction of non-project water into the California Aqueduct. The Program consists of sampling 57 dedicated monitoring wells and 85 recovery wells. Sampling is performed in accordance with a sampling plan and schedule established in collaboration with the KFMC and in accordance with the Department's policies for introducing non-project water into the California Aqueduct. KWB groundwater monitoring wells are sampled on an annual basis in accordance with the 1997 *Sampling Plan for Groundwater Monitoring for Kern Fan Monitoring Program*.²⁸ Recovery wells are sampled in accordance with the 2012 *Kern Water*

*Bank Recovery Program Water Quality Monitoring Plan*²⁹ prepared and approved by the Department and the SWP facilitation group to comply with DWR's Pump-In-Policy Tier 2 provisions. A more detailed description of the sampling program and associated schedule for sampling of specific constituents is provided in Appendix 7-1.

Groundwater quality sampling data are reported to KCWA and the KFMC for further evaluation, analysis, and determination of whether adverse impacts are likely to result from groundwater banking operations within the Kern County Subbasin, per the requirements of the 1995 KWB MOU. Water quality data are reported in Kern Fan Operations Reports that are required to be prepared by the KFMC on an annual basis. The most recent published KFMC operations report covers 2005-2006. However, groundwater data are available from KCWA through 2015.

KFMC previously delineated areas of groundwater quality concern in the Kern County Subbasin, which show elevated levels of total dissolved solids (TDS), fluoride, arsenic, ethylene dibromide (EDB), nitrate as NO₃, uranium, and dibromochloropropane (DBCP) on maps using historical data during 1998-2009 (Figure 7.2-4).⁶

Figures 7.2-5 through 7.2-9 present a series of maps, one each for TDS, arsenic, nitrate as NO₃, alpha, and uranium. These five maps show wells which were sampled for the specific constituent from 1995 through 2014; one or more groundwater samples exceeding an MCL were shown with a red dot and samples below an MCL were shown with an open dot. It should be noted that wells with a red dot do not necessarily represent a persistent concentration of a given COC above an MCL (refer to time-concentration graphs for relative degree of persistence).

Figure 7.2-5 (TDS) shows the distribution of wells where one or more samples exceeded the secondary MCL of 500 mg/L during 1995 to 2015. Areas of elevated TDS are located on the west to southwest one third of the property extending from the Elk Hills eastward into the valley. A second area of elevated TDS is located in the northeastern portion of KWB Lands (30S/25E-sections 1, 11, and 12 and 30S/26E-section 6).

Figure 7.2-6 (arsenic) shows the distribution of wells where one or more samples exceeded the 10 µg/L MCL during 1995 to 2015. Arsenic has no clearly apparent pattern other than it appears to be more widespread at and east of I-5 in the deepest parts of the aquifer system during times of recovery.

Figure 7.2-7 (nitrate as NO₃) shows that only one well (shallow well 29S/25E-27N02) exceeded the NO₃ MCL of 45 mg/L. No wells sampled within KWB Lands exceeded the MCL.

Figure 7.2-8 (alpha) and Figure 7.2-9 (uranium) show the distribution of wells where one or more samples exceeded the MCL during 1995 to 2015. Alpha is distributed in a wide west-southeast to east-northeast band north of the Kern River. Uranium was not as frequently detected as alpha so the distribution is not as well-known but appears to generally follow the pattern of alpha.

Because these figures represent a broad overview of the 1995 to 2015 time period, they were used with other data sources, such as tables summarizing data sets and individual time-concentration graphs included in Appendix 7-3, to evaluate potential impacts and their significance.

Potential migration of COCs can be lateral as well as vertical with respect to groundwater flow vectors induced through recharge and recovery (pumping). This is complicated because of variable periods and magnitudes of recharge and recovery. While the general horizontal flow direction is radially outward during periods of recharge (associated with groundwater mounding), it is radially inward during periods of recovery (associated with cones of depression). Overall and based on groundwater modeling results presented in Section 7.1, Surface Water and Groundwater Hydrology, it appears that there is little overall lateral change in water quality as recharge water (typically of better quality than of existing groundwater) both displaces and mixes with existing groundwater.

Pump-in Program

As described previously, recovered KWB water is delivered to the California Aqueduct for subsequent delivery (or by exchange) to KWB participants. Water introduced into the Aqueduct is called “pump-in water.” Pump-in water is produced from KWB recovery wells and introduced into turn-ins at the Aqueduct. Some surface conveyance facilities flow in either direction or, as in the case of the CVC and KWB Canal, are operated in two or more independent reaches. During periods of groundwater recovery, conveyance facilities could be carrying either water from its originally designated source or a blend of surface water and groundwater.

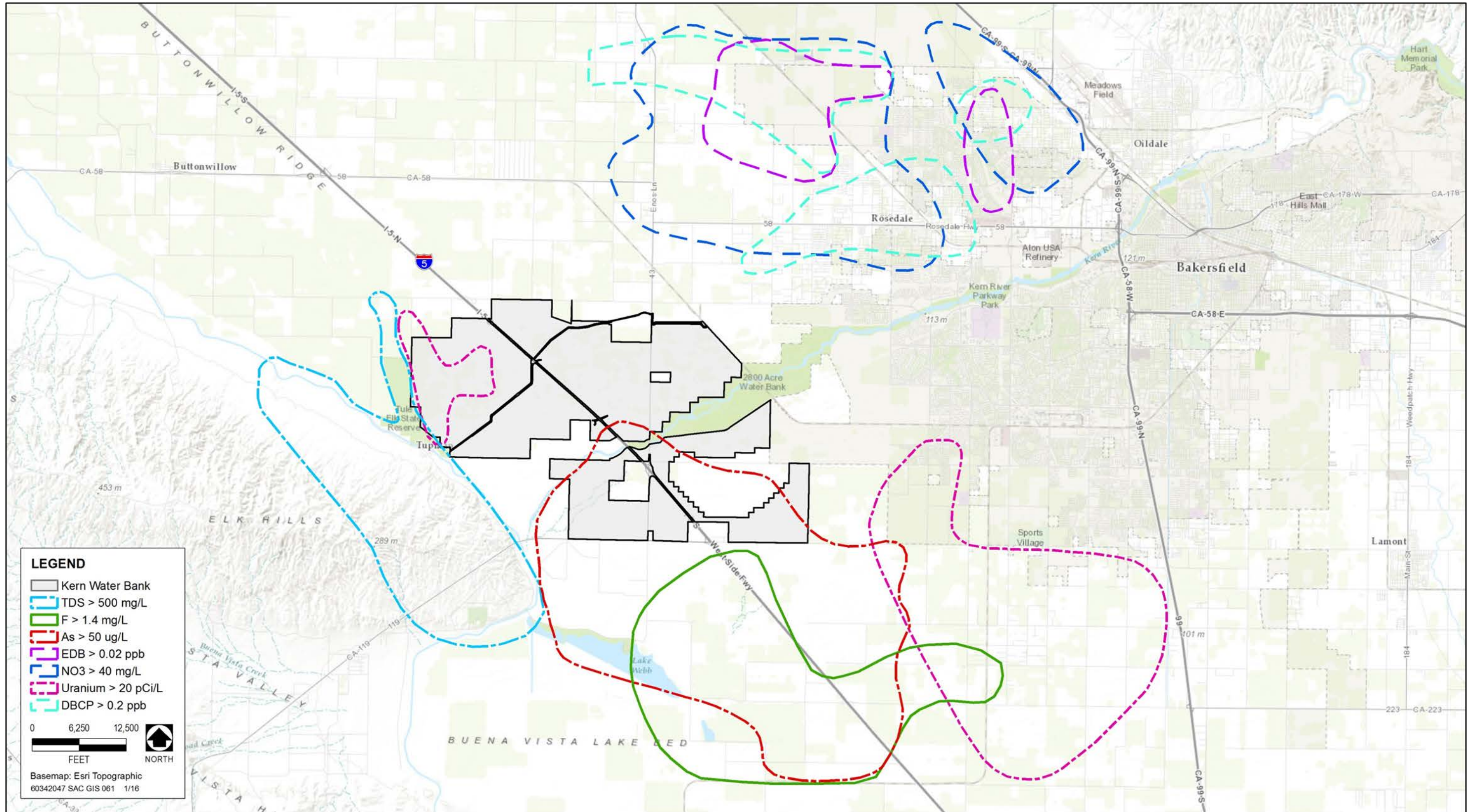
To protect water quality in the Aqueduct, KCWA has developed a blending model that calculates and tracks changes to water quality that result from various surface water and groundwater blending operations on a daily basis. Modeling results are also used to forecast water quality changes for pump-in proposals. Water quality COCs included in the blending models for the KCWA pump-in programs include arsenic, bromide, chromium (total and hexavalent), sulfate, nitrate, TDS, DOC, and uranium.

A station near Kettleman City at Check 21 of the Aqueduct is used as a background station for assessing water quality changes resulting from downstream pump-ins. Table 7.2-7 lists several districts/facilities that pump in water to the Aqueduct and the associated nearby check structures that are used for water quality sampling by the Department.

TABLE 7.2-7

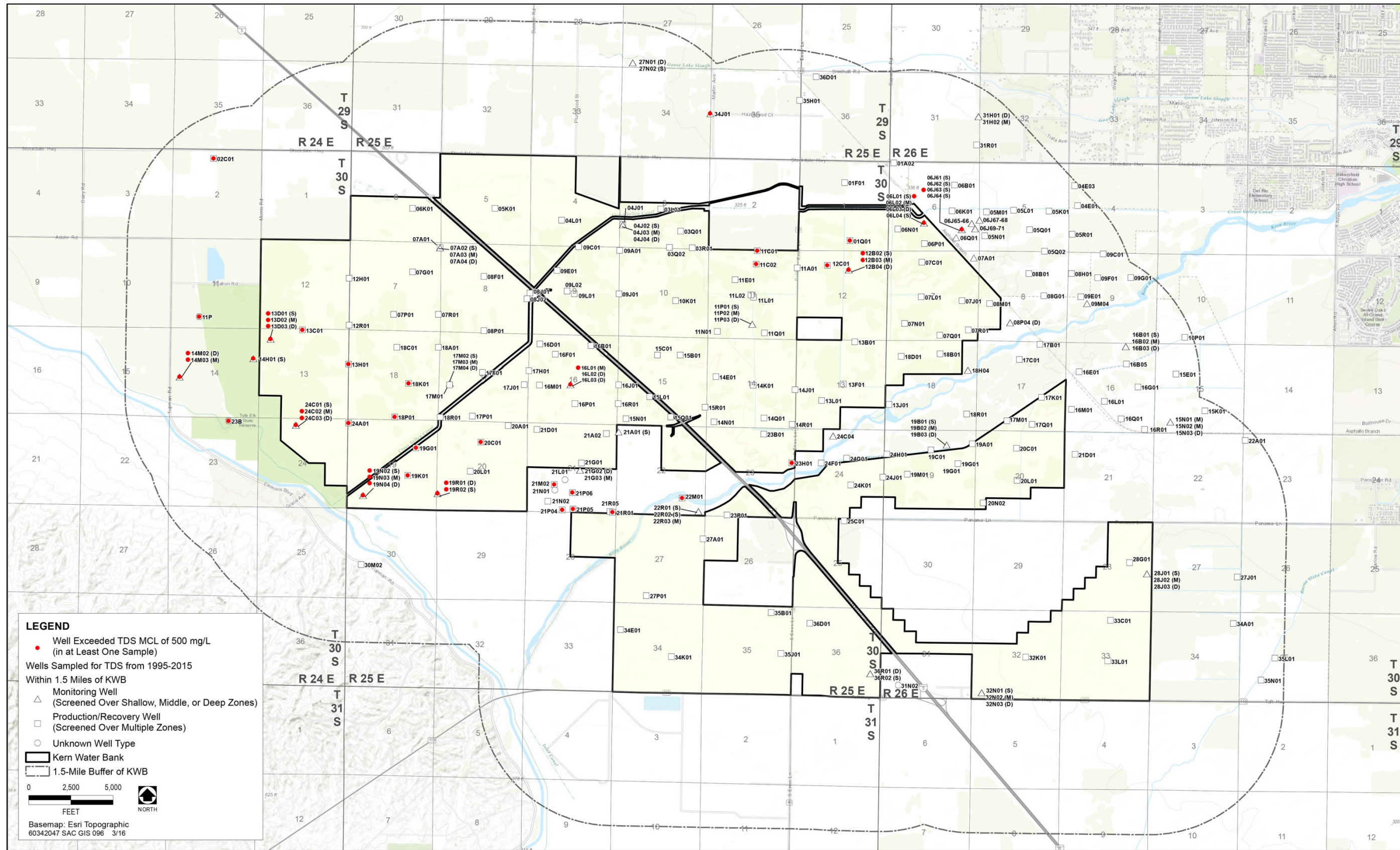
**CALIFORNIA AQUEDUCT PUMP-IN FACILITY LOCATIONS
AND NEAREST UPSTREAM SAMPLING SITES**

Agency/Facility Pumping In	Pump-in Facility Location		Upstream Sampling Site
Semitropic Water Storage District 3	Between Check 23 and Check 24	Milepost 206.99	Check 21 and Check 23
Semitropic Water Storage District 2	Between Check 24 and Check 25	Milepost 209.80	Check 21, Check 23, and Check 24
Cross Valley Canal	Between Check 27 and Check 28	Milepost 238.04	Check 25, Check 27, and Tupman Road
Kern Water Bank Canal	Between Check 28 and Check 29	Milepost 238.19	Check 25, Check 27, and Tupman Road
West Kern Water District	Between Check 28 and Check 29	Milepost 240.20	Cole's Levee
Wheeler Ridge–Maricopa Water Storage District	Between Check 29 and Check 40 at the Edmonston Pumping Plant	Various Mileposts	Check 29 and State Route 119
Arvin-Edison Water Storage District	Check 34 and Check 35 at the Teerink Pumping Plant	Milepost 277.30	Check 29 and State Route 119
Source: DWR 2014 ³⁰			



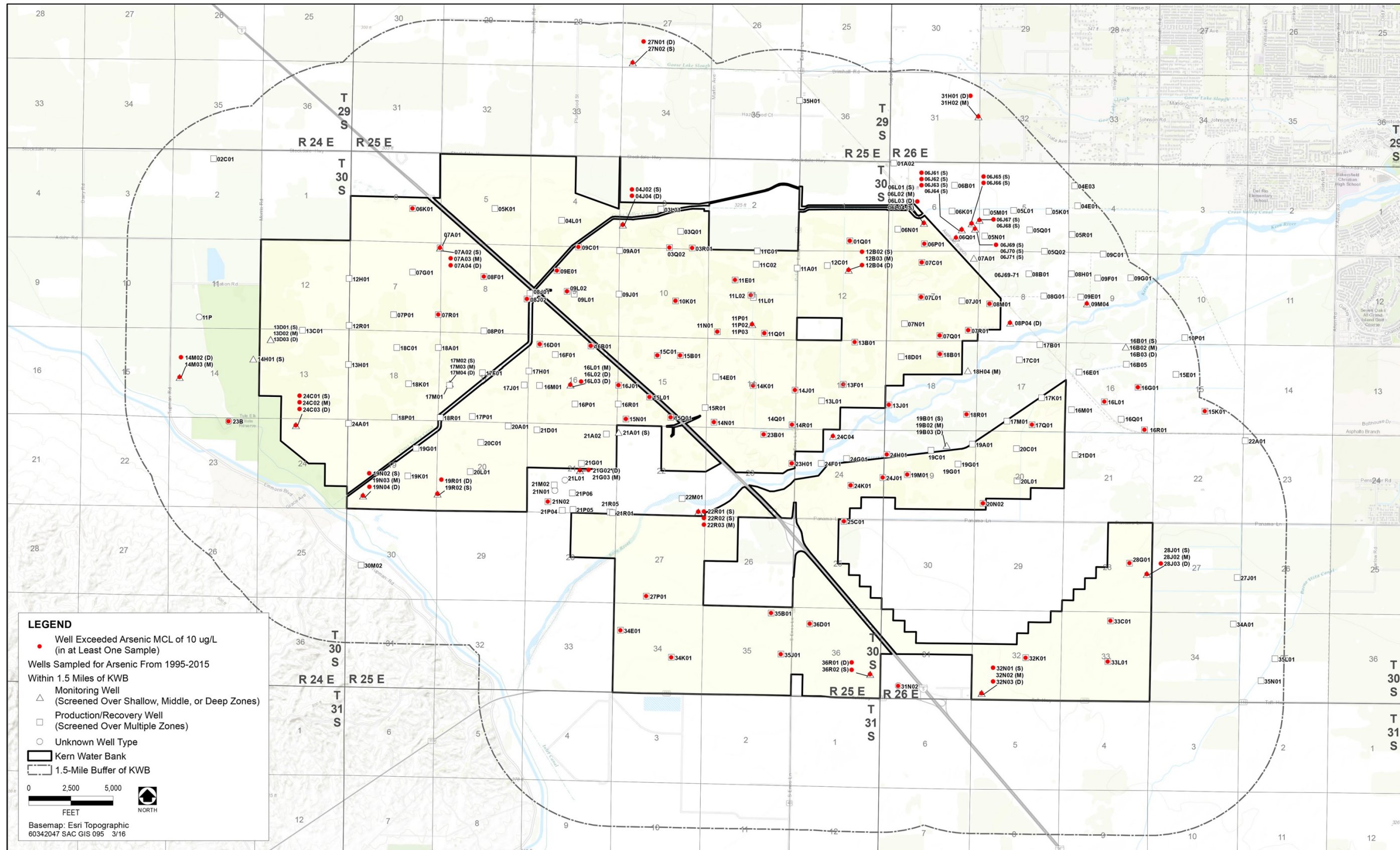
Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-4. Map Published in the Kern Fan Monitoring Committee Report as Areas of Groundwater Quality Concern, 1998 to 2006



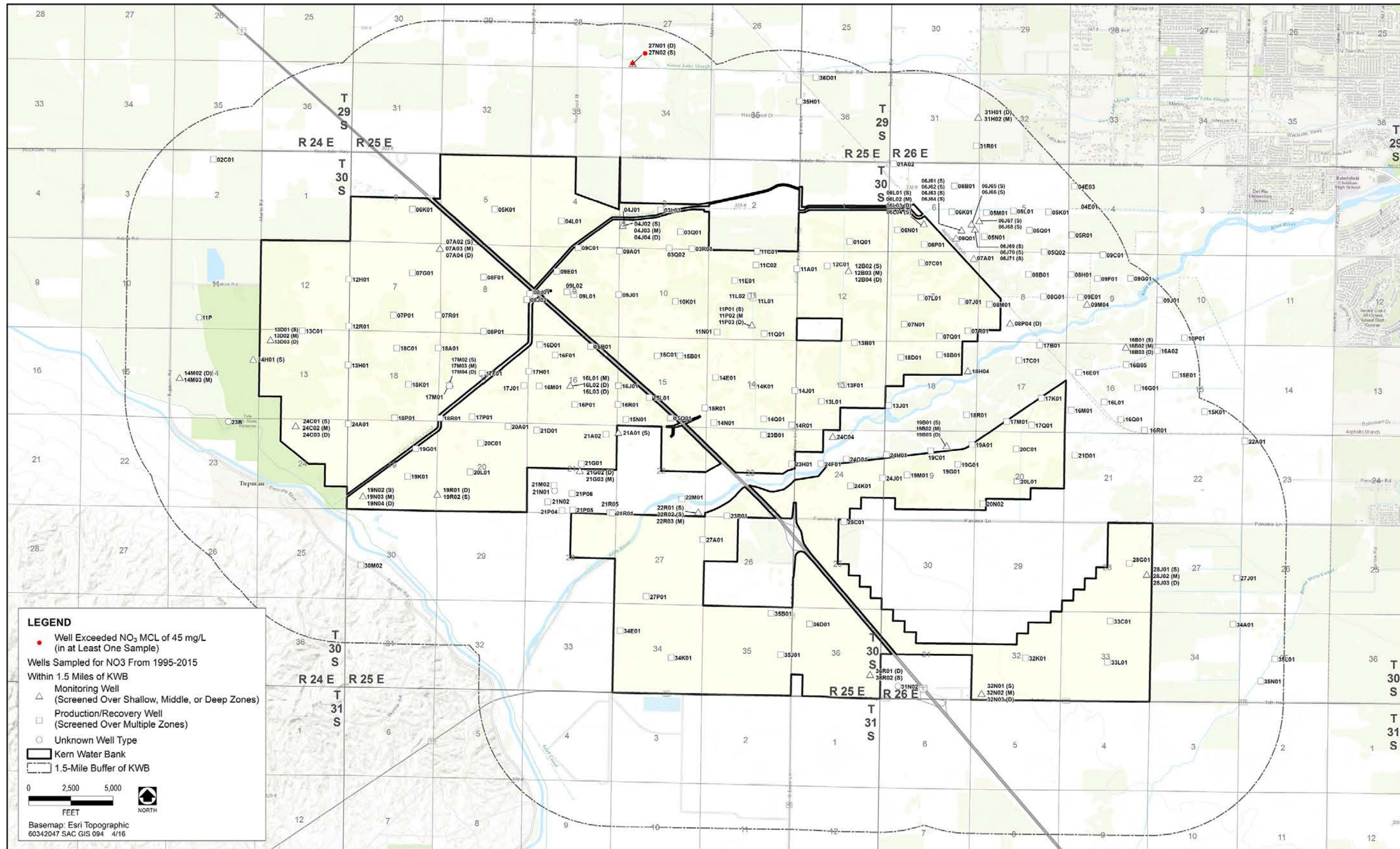
Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-5. Wells Sampled for Total Dissolved Solids, 1995 to 2015



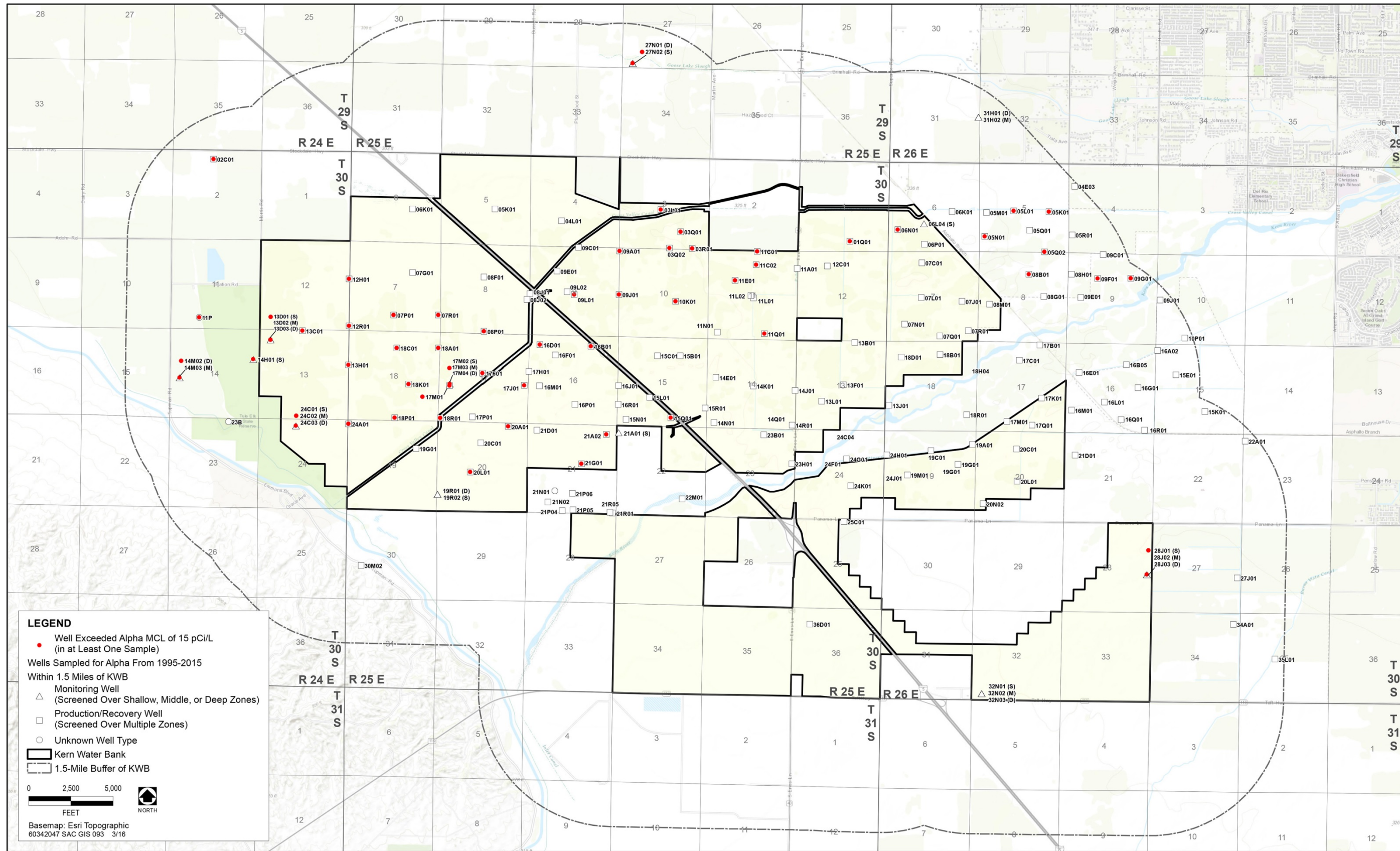
Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-6. Wells Sampled for Arsenic, 1995 to 2015



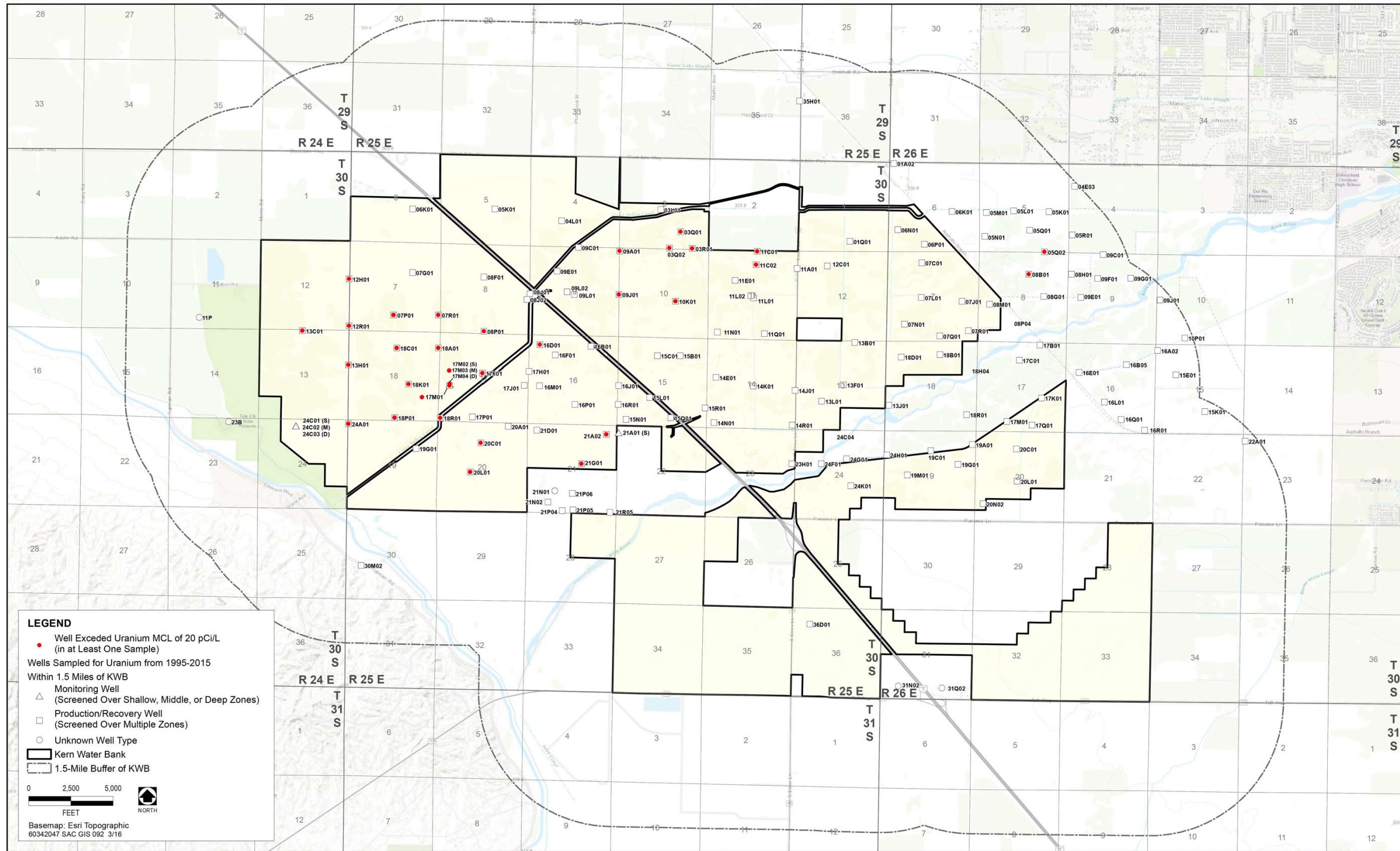
Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-7. Wells Sampled for Nitrate as NO₃, 1995 to 2015



Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-8. Wells Sampled for Alpha, 1995 to 2015



Source: 2005-2006 Kern Fan Monitoring Committee Report (KCWA 2009)

FIGURE 7.2-9. Wells Sampled for Uranium, 1995 to 2015

7.2.2.3 Regulatory Setting in 1995

1995

Three basic methods are available for managing groundwater resources in California:

- management by local agencies under authority granted in the California Water Code or other applicable state statutes,
- local government groundwater ordinances or joint-powers agreements, and
- court adjudications.

No state law requires that any of these forms of management be applied in a given basin. Management is often instituted after local agencies or landowners recognize a specific groundwater problem. The level of groundwater management in any basin or subbasin often depends on water availability and demand.

Federal Plans, Policies, Regulations, and Laws

Clean Water Act

EPA is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) of 1972 (33 United States Code 1251 et seq.) is the primary federal law that governs and authorizes water quality control activities by EPA and the State of California, and regulates the discharge of pollutants into navigable waters. State water quality programs and regulations are chiefly the products of federal mandates put into effect through the CWA and managed by EPA. Various elements of the CWA address water quality, as described below.

Under federal law, EPA has published water quality regulations under Title 40 of the Code of Federal Regulations. CWA Section 303 requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question, and (2) criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, EPA has designated the State Water Resources Control Board (SWRCB) and its nine regional water quality control boards (RWQCBs) with the authority to identify beneficial uses and adopt applicable water quality objectives.

Section 401 Water Quality Certification or Waiver

Under CWA Section 401(a)(1), applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects with a federal component that may affect state water quality must also comply with CWA Section 401. (Such projects include those that require federal agency approval such as issuance of permits under CWA Section 404, Sections 9 and 10 of the Rivers and Harbors Act, and licenses for hydroelectric power plants issued by the Federal Energy Regulatory Commission under the Federal Power Act.)

The CWA Section 401 water quality certification certifies that the proposed activity will not violate state water quality standards, and that the activity complies with all applicable limitations and restrictions.

The RWQCBs administer the Section 401 program with the intent of prescribing measures necessary to avoid, minimize, or mitigate adverse impacts of proposed projects on water quality. KWB Lands fall under the jurisdiction of the Central Valley RWQCB (CVRWQCB).

Section 402 Permits for Discharge to Surface Waters

SWRCB and RWQCBs regulate discharges of waste into waters of the United States through National Pollutant Discharge Elimination System (NPDES) permits, authorized under CWA Section 402, and regulate point-source (municipal and industrial) discharges of waste and pollutants into waters of the United States through WDRs authorized under the state's Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (see below).

Dischargers whose projects disturb 1 or more acres of soil are required to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity, known as the Construction General Permit. The Construction General Permit requires the project proponent to develop and implement a storm water pollution prevention plan (SWPPP), which must identify best management practices for protection from stormwater runoff. In addition, the SWPPP must contain a visual monitoring program, a chemical monitoring program, and a sediment monitoring plan if the site discharges directly to a water body listed on the CWA Section 303(d) list for sediment.³¹

Section 303 List of Impaired Waters

Under CWA Section 303(d), states are required to develop lists of water bodies that would not attain water quality objectives after point-source dischargers implement required levels of treatment. Section 303(d) requires that the state develop a Total Maximum Daily Load (TMDL) for each listed pollutant. The TMDL is the amount of loading that the water body can receive and still be in compliance with water quality objectives. The TMDL also can act as a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives.

EPA either must approve a TMDL prepared by the state or, if it disapproves the state's TMDL, must issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. It is anticipated that after the TMDL is implemented, the problems that led a given pollutant to be placed on the Section 303(d) list will be remediated.

Federal Anti-degradation Policy

The federal anti-degradation policy, established in 1968, is designed to protect existing uses and water quality and national water resources. The federal policy directs states to adopt a statewide policy that includes the following primary provisions:

- Existing instream uses and the water quality necessary to protect those uses shall be maintained and protected.
- Where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development.
- Where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

The Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) of 1974 (Public Law 93-523) was established to protect the public health and quality of drinking water in the United States, whether from aboveground or underground sources. EPA is the lead agency responsible for establishment of the National Primary Drinking Water Regulations for contaminants that could cause adverse public health effects, and for overseeing all states, localities, and water suppliers who implement these standards. The SDWA applies to every public water system in the United States, but does not apply to private wells or bottled water.

All surface waters require some form of treatment to meet drinking water standards. The degree of treatment needed depends on the quality of the raw water. The highest quality raw surface waters need only to be disinfected before being served to consumers. More typically, raw water is treated in a conventional water treatment plant that includes sedimentation, filtration, and disinfection processes. Although it is technically possible to treat virtually any raw water so that it will meet drinking water standards, it is usually not practical to do so. Municipal water suppliers prefer raw-water sources of high quality because their use minimizes risks to public health and the cost and complexity of treatment needed to meet SDWA drinking water standards.

The SDWA directed EPA to set national standards for drinking water quality, and required EPA to set MCLs for a wide variety of potential drinking water pollutants. The owners and operators of public water systems are required to comply with primary (health-related) MCLs and encouraged to comply with secondary (nuisance- or aesthetics-related) MCLs.

Federal drinking water standards for are set for various microorganisms; turbidity; disinfectants (chlorine, chloramine, and chlorine dioxide) and disinfection byproducts (bromate, chlorite, haloacetic acids, and trihalomethanes); inorganic chemicals (antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, copper, cyanide, fluoride, lead, mercury, nitrate, nitrite, selenium, and thallium), and more than 53 organic chemicals that include benzene, dioxin (2,3,7,8-TCDD), polychlorinated biphenyls (i.e., PCBs), styrene, toluene, vinyl chloride, and several pesticides. Standards also have been issued for synthetic volatile organic compounds and radionuclides (alpha particles, beta particles, photon emitters, radium, and uranium). EPA also identifies and lists unregulated contaminants on the "Contaminant Candidate List," and periodically reviews and decides whether to regulate listed contaminants. MCLs and the process for setting these standards are reviewed triennially.

EPA delegated to the California Department of Public Health (CDPH) the responsibility for administering California's drinking water program, making CDPH accountable to EPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by EPA. On July 1, 2014, the Drinking Water Program moved from CDPH to the SWRCB, Division of Drinking Water (DDW). The applicable state primary and secondary MCLs are set forth in CCR Title 22, Division 4, Chapter 15, Article 4 (see "California Code of Regulations Title 22" below for further discussion).

National Toxics Rule

EPA promulgated the National Toxics Rule (NTR) in 1992 to establish water quality criteria for 12 states and two territories, including California, that had not complied fully with CWA Section 303(c)(2)(B) (57 *Federal Register* [FR] 60848, December 22, 1992). When a state adopts and EPA approves water quality criteria that meet the requirements of CWA Section 303, EPA issues a rule amending the NTR to withdraw the federal criteria for that state. If the state's criteria are not less stringent than the federal criteria, EPA withdraws its criteria without notice. However, if a state adopts criteria that are less stringent than the federal criteria, but EPA decides that the criteria fully meet the requirements of the CWA, EPA will provide an opportunity for public comment before withdrawing the federal criteria.

State Plans, Policies, Regulations, and Laws

Agencies with Jurisdiction over Water Quality

SWRCB has broad authority over water-quality control issues for the state. Responsible for developing statewide water quality policy, SWRCB exercises the powers delegated to the state by the federal government under the CWA. Other state agencies with jurisdiction over water quality regulation in California include the SWRCB-DDW (formerly CDPH for drinking water regulations), the California Department of Pesticide Regulation, the California Department of Fish and Wildlife, and the California Office of Environmental Health Hazard Assessment.

Regional authority for planning, permitting, and enforcement is delegated by the SWRCB to the nine RWQCBs. The CVRWQCB is responsible for the regional area in which the KWB and Kern Fan Element are located.

The SWRCB Water Rights Division has primary regulatory authority over water supplies. The Water Rights Division issues permits for water rights that specify amounts, conditions, and construction timetables for diversion and storage facilities. Water rights decisions implement the objectives adopted in the water quality control plans (see “Porter-Cologne Water Quality Control Act”) and reflect water availability, recognize prior water rights and flows needed to preserve instream uses (such as water quality), and determine whether the diversion of water is in the public interest.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act of 1969 is California’s statutory authority for protecting water quality. It was enacted to preserve, enhance, and restore the quality of the state’s water resources. Under the Porter-Cologne Act, the state must adopt water quality policies, plans, and objectives that protect the state’s waters for the use and enjoyment of the people. The act sets forth the obligations of the SWRCB and the RWQCBs to adopt and periodically update water quality control plans (basin plans). Basin plans are the regional water quality control plans required by the California Water Code (Section 13240), the CWA, and the Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act defines water quality objectives as “...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area” (Water Code Section 13050[h]). In addition to defining objectives and water quality standards adopted by the RWQCBs, the basin plans include California’s policies for water quality control and have the force and effect of regulation.

The act requires waste dischargers to notify the RWQCBs of their activities through the filing of reports of waste discharge (RWD) and authorizes the SWRCB and the RWQCBs to issue and enforce waste discharge requirements (i.e., WDRs), NPDES permits, Section 401 water quality certifications, or other approvals. The RWQCBs also have authority to issue waivers to RWDs and/or WDRs for broad categories of “low threat” discharge activities that have minimal potential for adverse water quality effects when implemented according to prescribed terms and conditions.

Projects that may discharge wastes to land or water are required to conform to water quality objectives, policies, and procedures of the applicable basin plans. A change in water quality is allowed only if the change is consistent with the maximum beneficial use of the waters of the state, would not unreasonably affect present or anticipated beneficial uses, and would not result in water quality lower than that specified in the basin plan. The Porter-Cologne Act defines waters of the state as “any surface water or ground water, including saline waters, within the boundaries of the state.” Some waters that qualify as waters of the state, such as certain isolated wetlands and groundwater, do not necessarily

qualify as waters of the United States. This includes surface waters that are not tributary to navigable waters of the United States.

Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin

The Kern County Groundwater Subbasin is located within the Tulare Lake Hydrologic Region. Pursuant to the Porter-Cologne Act, the CVRWQCB prepares and updates the *Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin*.³² The Tulare Lake Basin Plan describes the officially designated beneficial uses for specific surface water and groundwater resources, the enforceable water quality objectives necessary to protect those beneficial uses, and a program of implementation needed to achieve objectives (Water Code Section 13050[jj]).

State and federal laws mandate the protection of designated beneficial uses of water bodies. State law defines “beneficial uses” as “domestic, municipal, agricultural and industrial water supply; power generation; recreation; aesthetic enjoyment; navigation; aquaculture; and preservation and enhancement of habitat for fish, wildlife, and other aquatic resources or preserves” (Water Code Section 13050[f]). Additional protected beneficial uses included in the Tulare Lake Basin Plan include groundwater recharge and freshwater replenishment. Kern County, and specifically KWB Lands, are located within the jurisdiction of the CVRWQCB (Region 5) and are subject to compliance with the Tulare Lake Basin Plan. Basin plans adopted by the RWQCBs are implemented primarily through the NPDES permitting system and WDRs are issued to regulate waste discharges so that water quality objectives are met. Basin plans provide the technical basis for determining WDRs and authorize the RWQCBs to take regulatory enforcement actions if necessary.

The Tulare Lake Basin Plan includes numerical and narrative water quality objectives for physical and chemical water quality constituents:

- For inland surface waters:
 - Numerical objectives are set for temperature, dissolved oxygen, turbidity, pH, toxicity, radioactivity, TDS, EC, bacterial content, various specific ions, trace metals, and synthetic organic compounds.
 - Narrative objectives are set for parameters such as suspended solids, sediment, biostimulatory substances (e.g., nitrogen and phosphorus), oil and grease, color, taste, odor, and aquatic toxicity.
- For groundwater:
 - Numerical objectives are set for toxicity, radioactivity, TDS, EC, bacterial content, and various specific ions, trace metals, pesticides, and organic compounds.
 - Narrative objectives are set for parameters such as taste and odor.

Narrative objectives are often precursors to numerical objectives. At a minimum, water designated for municipal and domestic water supply shall not contain concentrations of chemical constituents greater than the MCLs specified in the provisions of CCR Title 22, which are incorporated into the Tulare Lake Basin Plan and discussed below.

The Tulare Lake Basin Plan establishes a limit for the allowable maximum average annual EC increase in groundwater for the various hydrographic units. The Kern River, Poso, and Westside South hydrographic units are located within Kern County. The KWB operates within the nexus of the three hydrographic units. The Kern River Unit is allowed up to 5 µmhos per centimeter (µmhos/cm) per year, the Westside South Unit is allowed 1 µmhos/cm per year, and the Poso Unit is allowed up to 6 µmhos/cm per year.

California Code of Regulations Title 22

CDPH has been responsible for the domestic water quality and monitoring requirements listed in CCR Title 22, Division 4, Chapter 15 (Article 16, Section 64449), which define drinking water standards. Drinking water MCLs directly apply to water supply systems “at the tap” (e.g., at the point of use by consumers in their homes or offices). California MCLs, both primary and secondary, directly apply to groundwater and surface water resources when they are specifically referenced as water quality objectives in the basin plan. In such cases, MCLs become limits enforced by the SWRCB and RWQCBs. When fully protective of health, MCLs also may be used to interpret narrative water quality objectives in the basin plan that prohibit toxicity to humans in water designated as a source of drinking water (MUN).

CCR Title 22 became effective January 3, 2001. Monitoring for hexavalent chromium was to have been completed by December 31, 2002; and for other chemicals, by December 31, 2003.

California State Non-degradation Policy

In 1968, as required under the federal anti-degradation policy described above, the SWRCB adopted a non-degradation policy aimed at maintaining the high quality of waters in California. The non-degradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. Any discharges associated with KWB activities would be required to comply with this policy.

The non-degradation policy provides as follows:

- Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.
- Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet WDRs, which would ensure (1) pollution or nuisance would not occur and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Well Standards

Department Bulletin 74-81, *Water Well Standards: State of California*, and Bulletin 74-90, *California Well Standards*, together establish standards for constructing, altering, maintaining, and destroying water supply wells and monitoring wells, such as the KWB’s production and monitoring wells. Bulletin 74-90 revises some but not all portions of Bulletin 74-81; therefore, the bulletins must be considered together before any wells are constructed, modified, or destroyed.

California Division of Oil, Gas and Geothermal Resources

The California Division of Oil, Gas and Geothermal Resources (DOGGR) regulates production of oil and gas, as well as geothermal resources, in the state of California. DOGGR oversees the drilling, operation, maintenance, and plugging and abandonment of onshore and offshore oil, gas, and geothermal wells, to protect life, health, property, and natural resources; underground and surface waters suitable for irrigation or domestic use; and oil, gas, and geothermal reservoirs. Responsibilities of DOGGR are identified in CCR Title 14, Division 2, Chapter 4, and include well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines.

Underground Injection Control Program

In California, wells that inject fluids associated with oil and natural gas production operations (Class II injection wells) also are regulated by DOGGR under its Underground Injection Control (UIC) Program. The main features of the UIC Program include permitting, inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, and public outreach. 14 CCR §1724.6 requires that DOGGR approve “any subsurface injection or disposal project,” including all UIC Class II wells. 14 CCR §§1724.7 and 1724.8 lists the data an injection well operator must submit to DOGGR to obtain approval for cyclic steam projects. 14 CCR §1724.10 lists the filing, notification, operating, and testing requirements for underground injection projects.

The injection plan must ensure that injection fluids will be confined to the intended zone or zones of injection (14 CCR §1724.7(c)(3)). To confirm that injection fluid is confined to the approved zone or zones, and will not leak to other formations or zones during injection, mechanical integrity testing must be performed on each injection well when the project begins and periodically thereafter (14 CCR §1724.10(j)). When abandoning a well, injection well operators are also required to use every effort and endeavor to protect underground or surface water suitable for irrigation or domestic purposes from the infiltration of detrimental substances (Public Resources Code §3228 [see also related: 14 CCR §1722.4; 14 CCR §1723.1[b]; 14 CCR §1723.2; 14 CCR §1724.10[h]; 14 CCR §1724.10[f]). DOGGR directly regulates the exploration and production of oil and gas in Kern County for conformance with California’s conservation laws. Pursuant to CCR, Title 14, Division 2, Chapter 4, Section 1722 (k), DOGGR establishes Field Rules which supplement more broadly applicable statutory and regulatory requirements regarding well operations in order to protect California’s water resources and health and safety. Field Rules have been adopted for most zones and fields in Kern County and are available online.

Senate Bill 1281 – Disclosure of Oil and Gas Water Use and Disposal

Senate Bill 1281 (SB 1281), effective January 2015, amended Sections 3226.3 and 3227 of the Public Resources Code to require that: (1) DOGGR provide the SWRCB with an annual “inventory of all unlined oil and gas field sumps”; and (2) well operators provide DOGGR with quarterly information regarding the source and disposition of water produced by or used in oil and gas production in addition to existing obligations to report gas and oil production and produced water information on a monthly basis.

Regional and Local Plans, Policies, Regulations, and Ordinances

1995 Kern Water Bank Memorandum of Understanding

On October 26, 1995, a MOU was reached between the KWB participants and the Adjoining Entities regarding KWB operation and monitoring of the KWB Groundwater Banking Program (see Appendix 7-5a). The KWB participants consist of Dudley Ridge and Tejon-Castac Water Districts, KCWA, Semitropic and Wheeler Ridge–Maricopa Water Storage Districts, and Westside Mutual Water Company, collectively known as the KWBA. The Adjoining Entities consist of the Buena Vista and Rosedale–Rio Bravo Water Storage Districts and the Kern Delta, Henry Miller, and West Kern Water Districts.

Consistent with the Project Description (see end of Appendix 7-5a), KWB participants will make a good faith effort to meet the following objectives, which may or may not be met:

- 1) The Parties should operate their projects in such manner as to maintain and, when possible, enhance the quality of groundwater within the Project Site and the Kern Fan Area.

- 2) If supplies of acceptable recharge water exceed recharge capacity, all other things being equal, recharge priority should be given to the purest or best quality water.
- 3) Each project within the Kern Fan Area should be operated with the objective that the average concentration of total dissolved salts in the recovered water will exceed the average concentration of total dissolved salts in the recharged water, at a minimum, by a percentage equal to or greater than the percentage of surface recharge losses. The average shall be calculated from the start of each Project.
- 4) To maintain or improve groundwater quality, recovery operations should extract poorer quality groundwater where practicable. Blending may be used to increase extraction of lesser quality groundwater unless doing so will exacerbate problems by generating unfavorable movement of lesser quality groundwater. It is recognized that the extent to which blending can help to resolve groundwater quality problems is limited by regulatory agency rules regarding discharges into conveyance systems used for municipal supplies, which may be changed from time to time.
- 5) All groundwater pumpers should attempt to control the migration of poor quality water. Extensive monitoring will be used to identify the migration of poor quality water and give advance notice of developing problems. Problem areas may be dealt with by actions including, but not limited to:
 - a) limiting or terminating extractions that tend to draw lesser quality water toward or into the usable water areas;
 - b) increasing extractions in areas that might generate a beneficial, reverse gradient;
 - c) increasing recharge within the usable water area to promote favorable groundwater gradients.
- 6) It is intended that all recovery of recharged water be subject to the so-called "golden rule." In the context of a banking project, the "golden rule" means that, unless acceptable mitigation is provided, the banker may not operate so as to create conditions that are worse than would have prevailed absent the project giving due recognition to the benefits that may result from the project...
- 7) The Project should be developed and operated so as to prevent, eliminate or mitigate significant adverse impacts. Thus, the Project shall incorporate mitigation measures as necessary. Mitigation measures to prevent significant adverse impacts from occurring include but are not limited to the following: (i) spread out recovery area; (ii) provide buffer areas between recovery wells and neighboring overlying users; (iii) limit the monthly, seasonal, and/or annual recovery rate; (iv) provide adequate well spacing; (v) adjust pumping rates or terminate pumping to reduce impacts, if necessary; (vi) impose time restrictions between recharge and extraction to allow for downward percolation of water to the aquifer; and (vii) provide recharge of water that would otherwise not recharge the Kern Fan Basin. Mitigation measures that compensate for unavoidable adverse impacts include but are not limited to the following: (i) with the consent of the affected overlying user, lower the pump bowls or deepen wells as necessary to restore groundwater extraction capability to such overlying user; (ii) with the consent of the affected overlying user, provide alternative water supplies to such overlying user; and (iii) with the consent of the affected overlying user, provide financial compensation to such overlying user.

The MOU's recitals define "significant adverse impacts" as those impacts to "water levels, water quality or land subsidence within the boundaries of Adjoining Entities, or otherwise interfere with the existing and ongoing programs of Adjoining Entities."

The following "Minimum Operating Criteria" numbered objectives in the 1995 KWB MOU apply to water quality:

- 1) The Monitoring Committee shall be notified prior to the recharge of potentially unacceptable water, such as "produced water" from oilfield operations, reclaimed water, or the like. The Monitoring Committee shall review the proposed recharge and make recommendations respecting the same as it deems appropriate. Where approval by the RWQCB is required, the issuance of such approval by said Board shall satisfy this requirement.
- 2) Recharge may not occur in, on or near contaminated areas, nor may anyone spread in, on or near an adjoining area if the effect will be to mound water near enough to the contaminated area that the contaminants will be picked up and carried into the uncontaminated groundwater supply. When contaminated areas are identified within or adjacent to the Project, the KWBA and the Project Participants shall also:
 - a) Participate with other groundwater pumpers to investigate the source of contamination
 - b) Work with appropriate authorities to ensure that the entity or individual, if any, responsible for the contamination meets its responsibilities to remove the contamination and thereby return the Project site to its full recharge and storage capacity;
 - c) Operate the project in cooperation with other groundwater pumpers to attempt to eliminate the migration of contaminated water toward or into usable water quality areas.
- 14) The Kern Fan Element Groundwater Model, with input from the Project Participants and Adjoining Entities, and utilizing data from a comprehensive groundwater monitoring program, may be used by the Monitoring Committee as appropriate to estimate groundwater impacts of the project.

Other Local Ordinances

A method of managing groundwater in California is through adoption of ordinances by local governments such as cities or counties. Thirty counties have adopted groundwater ordinances. The authority of counties to regulate groundwater has been challenged. In 1995, however, the California Supreme Court declined to review an appeal of a lower court decision, *Baldwin v. County of Tehama* (1994), which holds that state law does not occupy the field of groundwater management and does not prevent cities and counties from adopting ordinances to manage groundwater under their police powers.

Local ordinances passed during the 1990s significantly increased the potential role of local governments in groundwater management. The intent of most ordinances has been to hold project proponents accountable for impacts that may result from proposed export projects. Because most of these ordinances have been adopted fairly recently, their effect on local and regional groundwater management planning efforts is not yet fully known.

7.2.2.4 Changes in Regulatory Setting between 1996 and 2014

State Plans, Policies, Regulations, and Laws

California Safe Drinking Water Act

On July 1, 2014, the Drinking Water Program was transferred from CDPH to the SWRCB-DDW, which adopts drinking water standards as part of the Drinking Water Program pursuant to the California SDWA. These standards directly apply to public drinking water systems and to water delivered to customers. Under the California SDWA, untreated public drinking water from groundwater and surface water sources (systems serving 15 or more connections or more than 25 people per day) is monitored regularly for CCR Title 22 constituents.

MCLs are components of the drinking water standards adopted by the SWRCB-DDW/CDPH. Primary MCLs are based on human health protection, while secondary MCLs are based on human welfare considerations (e.g., taste, odor, laundry staining). EPA also adopts MCLs under the federal SDWA. Some California MCLs are more stringent than EPA MCLs, but are required to be at least stringent as those adopted by EPA.

Under the California SDWA, the MCL for arsenic was reduced from 50 µg/L to 10 µg/L in 2008.

Water Quality Control Plan for the Tulare Lake Basin

The CVRWQCB updated the *Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin*. The current version was adopted on March 27, 2014 and went into effect on January 26, 2015. Amendment to the Basin Plan included incorporation of SWRCB policies that are pertinent to the Basin Plan.

California NPDES General Construction General Permit

The SWRCB's NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, 2009-0009-DWQ (Construction General Permit) is a general NPDES permit authorizing statewide stormwater discharges associated with construction activities that disturb 1 or more acres and that meet the terms and conditions defined in the permit.³³ With regard to Permitted Activities, the Construction General Permit covers the following:

- Any construction activity resulting in a land disturbance of 1 acre or greater;
- Construction activity resulting in land surface disturbances of less than 1 acre if the construction activity is part of a larger common plan of development;
- Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture;
- Construction activity associated with linear underground or overhead projects such as pipelines or electric utilities; and
- Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.

The Construction General Permit does not cover discharges composed entirely of flows which are from conveyances (e.g., pipes or ditches used for collecting and conveying storm water runoff) and which do not come in contact with any raw material, intermediate products, finished product, byproduct, or waste products located on the operations. The Clean Water Act (33 USC § 1342(l)(2)) exempts these activities from NPDES permitting. Generally, the Construction General Permit would not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

For projects that do require coverage under the Construction General Permit, project applicants are required to prepare and submit Permit Registration Documents (PRDs) that include a Notice of Intent (NOI) to comply with the general permit, a site map, and the appropriate fees prior to construction. To reduce the risk of adverse effects to water quality, the project applicants must also prepare the following documents:

- A risk assessment consisting of two components: (1) project sediment risk—the relative amount of sediment that can be discharged, given the project and location details—and (2) receiving water risk—the risk sediment discharges pose to the receiving waters.
- A SWPPP, which includes a list of Best Management Practices (BMPs) addressing and designed to reduce, among other things, sources of sediment associated with construction and construction site erosion and the potential for discharge of pollutants after construction is completed.
- A monitoring and reporting program to demonstrate compliance with the Construction General Permit's requirements.
- Post-construction on-site water balance calculations.

Beginning September 2, 2012, project applicants will be required to implement long-term maintenance plans to achieve applicable water balance requirements and implement BMPs to reduce post-construction pollutant runoff.

Discharges with Low Threat to Water Quality

The SWRCB's Water Quality Order 2003-003-DWQ, Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (SWRCB, 2003³⁴) addresses potential discharges of low water quality–threat wastewater. Discharges that may be covered include hydrotest water, well development water, boring waste discharge, and monitoring well purge water discharge. In accordance with this permit, all dischargers must comply with all applicable provisions in the water quality control plan governing that region (i.e., the Tulare Lake Basin Plan), including any prohibitions and water quality objectives for both surface water and groundwater. In addition, the discharge of waste may not cause the spread of groundwater contamination. Discharges must be made to land owned or controlled by the discharger, unless the discharger has a written lease or agreement with the landowner. An NOI must be filed with the regional board (in this case the CVRWQCB) prior to any wastewater discharge to land that would have low water quality–threat discharges. Compliance with permit terms, including any monitoring, and filing a notice of termination upon completion of the activity are also required.

The CVRWQCB allows the discharge to surface waters of certain categories of clean or relatively pollutant-free wastewater posing little or no threat to water quality. The CVRWQCB Order No. R5-2008-0081, Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters (CVRWQCB, 2008)³⁵ covers discharges of waste to waters of the state provided they do not contain significant quantities of pollutants and either (a) the discharge is 4 months or less in duration or (b) the average dry weather discharge does not exceed 0.25 million gallons per day. All pollutants must be properly treated prior to discharge to ensure continuous compliance with applicable water quality requirements. Similar to the SWRCB's general permit for low-threat discharges to land, an NOI must be filed with the regional board (in this case the CVRWQCB) and substantive and other procedural requirements apply.

Groundwater Legislation

The California Legislature recognized the need for groundwater data when making sound local management decisions. In 1999, the Legislature approved funding for and directed the Department to update the inventory of groundwater basins from Bulletin 118 (1975), *California's Ground Water*, and Bulletin 118-80 (1980), *Ground Water Basins in California*. AB 599 (2001) subsequently required the SWRCB to establish a comprehensive monitoring program to assess groundwater quality in each groundwater basin in the state and increase coordination among agencies that collect information about groundwater contamination. Senate Bill (SB) 1938, enacted in 2002, added new requirements for local agency groundwater management plans to be eligible for public funds for groundwater projects.

California Toxics Rule and State Implementation Plan

The California Toxic Rule (CTR) (65 FR 31682, May 18, 2000) was issued in response to the requirements of the NTR. The CTR set numeric water quality criteria for approximately 130 priority pollutants, trace metals, and organic compounds. The CTR criteria are regulatory criteria adopted for inland surface waters, enclosed bays, and estuaries in California that are subject to CWA Section 303(c). The NTR and CTR include criteria for the protection of aquatic life and human health. Human health criteria (water- and organism-based) apply to all waters within a "Municipal and Domestic Supply" beneficial use designation, as indicated in the basin plan water quality objectives for toxic pollutants.

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, also known as the State Implementation Plan (SIP), was adopted by the SWRCB in 2000. The SIP establishes provisions for translating CTR and NTR criteria and basin plan water quality objectives for toxic pollutants into NPDES permit effluent limits, effluent compliance determinations, monitoring, and provisions for controlling chronic (long-term) toxicity. In addition, the SIP initiates the development of site-specific water quality objectives and the granting of exceptions for effluent compliance. The goal of the SIP is to establish a standardized approach for the permitting of discharges of toxic effluents to inland surface waters, enclosed bays, and estuaries in a consistent fashion throughout the state.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act of 2014 (SGMA) was enacted on September 16, 2014. The SGMA provides a framework for sustainable management of groundwater supplies, and it strengthens local control and management of groundwater basins throughout the state with little state intervention. The Legislature declares that "excessive groundwater extraction can cause overdraft, failed wells, deteriorated water quality, environmental damage, and irreversible land subsidence that damages infrastructure and diminishes the capacity of aquifers to store water for the future."³⁶ The SGMA lists the following undesirable results caused by groundwater conditions and affecting water quality:

- significant and unreasonable seawater intrusion;
- degraded water quality, including the migration of COC plumes; and
- depletions of interconnected surface water that have significant impacts on beneficial uses of the surface water.

Regional and Local Plans, Policies, Regulations, and Ordinances

1997 Monterey Initial Study and Addendum

The 1997 Monterey IS and Addendum analyzed potential environmental impacts associated with implementation of the KWB HCP/NCCP (see Appendix 7-6a). This document stated that the quality of water used for recharge was very good and not expected to increase TDS and organic constituent concentrations in the local groundwater. The 1997 Monterey IS and Addendum also noted that the quality of water for recharge would be expected to vary and would require monitoring to avoid degradation of local water quality and exacerbation of negative salt balance in the region. Areas of soil contamination from prior oil and agricultural operations (noted to occur at/or near some recharge areas) were to be avoided to prevent mobilization and degradation of groundwater quality. Remediation of any contamination was to be coordinated by the RWQCB (or other local regulatory agencies) tasked with oversight of remedial investigations and cleanup. Respective to groundwater quality, the 1997 Monterey IS and Addendum includes the following mitigation measures required for implementation by KWBA:

- Mitigation Measure C-1 – Implementation of MOU. Key aspects of the 1995 KWB MOU are summarized above (also see Appendix 7-5a).
- Mitigation Measure C-2 – Hydrocarbon Contamination Monitoring – whereby the KWBA would continue to monitor the remediation of the current and any future hydrocarbon contamination working with local regulatory agencies (such as the RWQCB) to ensure investigations and remedial activities are implemented to ensure protection of groundwater quality.

Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan

KCWA's Kern County Integrated Regional Water Management Plan (Kern IRWMP) was developed in collaboration with water suppliers, community and government representatives, environmental groups, businesses, and a variety of other interested parties (Kennedy Jenks Consultants, 2011).³⁷

A goal of the Kern IRWMP is to improve overall water quality. The Kern IRWMP outlines the following specific measureable objectives related to water quality:

- Monitor and/or manage headwaters/areas of origin, natural streams, and recharge areas to prevent or mitigate contamination.
- Identify and preserve prime recharge areas in the Kern Fan area and other areas.
- Improve water quality for disadvantaged communities and the watershed throughout the planning horizon.
- Continue to provide drinking water that meets or exceeds water quality standards; support efforts to attain appropriate standards throughout the planning horizon.
- Maximize the use of lesser quality water for appropriate uses (landscaping, certain agricultural crops, "aesthetic" projects) throughout the planning horizon.

Kern County General Plan

Portions of KWB Lands west of Enos Lane are governed by the *Kern County General Plan*. The general plan was adopted by the Kern County Board of Supervisors on June 15, 2004, and was last amended on September 22, 2009. The *Kern County General Plan* identifies policies that provide long-range guidance to county officials who make decisions affecting growth and resources in unincorporated Kern County, excluding the unincorporated portion of the county within the metropolitan

Bakersfield planning area. The general plan helps ensure that day-to-day planning and land use decisions conform to the long-range program.

An overarching goal of the *Kern County General Plan* is to ensure that environmental resources are protected and adequate infrastructure is developed. The plan specifically emphasizes ensuring adequate water supplies and acceptable quality for future growth.³⁸ The plan is reviewed and updated periodically as the community's goals and requirements evolve.

The following water quality–related goals and policies from the Land Use, Open Space, and Conservation Element of the *Kern County General Plan* are applicable to KWB activities:

Public Facilities and Services Goal 5: Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural users within Kern County.

- **Public Facilities and Services Policy 2:** The efficient and cost-effective delivery of public services and facilities will be promoted by designating areas for urban development which occur within or adjacent to areas with adequate public service and facility capacity.
 - a. Ensure that water quality standards are met for existing users and future development.
 - b. Ensure that adequate storage, treatment, and transmission facilities are constructed concurrently with planned growth.

Resource Goal 3: Ensure the development of resource areas minimize effects on neighboring resource lands.

- **Resource Policy 10:** To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:
 - (b) Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
 - (c) Support the development of groundwater management plans.

Metropolitan Bakersfield General Plan (Unincorporated Planning Area)

Portions of KWB Lands east of Enos Lane would be governed by the *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*. This general plan is a separate but interrelated planning program for Kern County. The boundaries of the planning area were mutually agreed upon by the City of Bakersfield and Kern County as part of the joint adoption of the *Metropolitan Bakersfield General Plan* and represent the area where planning and land use decisions could affect both the City of Bakersfield and Kern County.³⁹ The general plan was adopted by the Kern County Board of Supervisors on December 3, 2002 and was last amended on December 11, 2007.

The following goals and policies related to water quality from the Conservation Element of the *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)* are applicable to KWB activities:

Water Resources Goal 4: Continue cooperative planning for and implementation of programs and projects which will resolve water resource deficiencies and water quality problems.

- **Water Resources Policy 5:** Work towards resolving the problem of groundwater resource deficiencies in the upland portions of the planning area.
- **Water Resources Policy 6:** Protect planning area groundwater resources from further quality degradation.

- **Water Resources Policy 7:** Provide substitute or supplemental water resources to areas already impacted by groundwater quality degradation by supporting facilities construction for surface water diversions.

Water Resources Goal 6: Maintain effective cooperative planning programs for water resource conservation and utilization in the planning area by involving all responsible water agencies in the planning process.

- **Water Resources Policy 9:** Encourage and implement water conservation measures and programs.

7.2.3 IMPACTS AND MITIGATION MEASURES

7.2-1 KWB construction and maintenance activities could potentially change groundwater quality.

1996 – 2014

KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, a network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (>36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

Construction of KWB infrastructure could adversely affect surface or groundwater water quality if construction spills or other pollutants were introduced into surface waters or the groundwater system. KWB construction and well installation activities were subject to general construction and grading permits following local, state, and federal regulations. This includes an NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activities. BMPs were guided by county and state regulations including CVRWQCB authorization and permit requirements. Water well requirements include Article 14.08 of the Kern County Ordinance Code (specifically Article III Well Standards). Department Bulletins 74-81 and 74-90 provide specific State-issued minimum standards for well construction and well destruction, noting that the Department is not a regulatory agency. Construction of wells followed permits and policy's under the Kern County Environmental Health Services Water Program (Water Well Permits Policy Manual). Grading and stormwater protection permits were obtained, monitored, and approved as appropriate. Construction of KWB facilities during this time period are not known to have caused any substantial adverse impacts on groundwater water quality.

All infrastructure requires maintenance, including the numerous production wells and monitoring wells on KWB Lands. The production wells require periodic rehabilitation to maintain or improve well efficiency. Rehabilitation necessary to maintain the yield of production wells generally consists of two components: (1) the addition of chemicals to breakdown slime or iron bacteria mass or encrustation that reduce the size of the well perforations; and (2) mechanical cleaning with a brush, surge block, or water under high pressure (this includes well redevelopment).

Chemicals added to the wells include several acids, hydrogen peroxide, and specially developed polymers chosen to react with the bacteria, slime, or encrusting minerals. Chemical addition techniques have been developed to ensure that the chemicals do not add contaminants to groundwater, and that they are neutralized or diluted by water pumped into the well and subsequently into the groundwater

through well perforations.⁴⁰ The mechanical cleaning adds no contaminants to groundwater because the movement of groundwater or clean surface water is used to dislodge particles.

Construction BMPs are required by local regulatory and state regulatory agencies. This includes permitting, monitoring, reporting, inspections (with approval) and reporting on the work, as appropriate. All work would be required to be completed within the regulatory framework. Waste containment and disposal would be required to be in accordance within state and federal regulatory guidelines, including retention of records (including those associated with waste manifests). Maintenance of KWB facilities during this time period are not known to have caused any substantial adverse impacts on groundwater water quality.

Therefore, construction- and maintenance-related impacts from 1996 to 2014 on groundwater quality were ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program. Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds wells and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

These activities would be subject to construction contract BMPs, CVRWQCB authorization and permit requirements regarding construction under NPDES permits, and Article 14.08 of the Kern County Ordinance Code (specifically Article III Well Standards). Department Bulletins 74-81 and 74-90 provide specific State-issued minimum standards for well construction and well destruction, while the local city and county provide enforcement. Water well permits would be regulated by the Kern County Environmental Health Services (KCEHS) Water Program (See Section 7.0.4.1.6) under which new wells and well deepening, reconstruction, and destruction would be subject to permits requiring compliance. Drilling operations would follow grading permits (if needed) and well permit regulations in accordance to general conditions stipulated in KCEHS water well permit applications.

Ongoing future facility maintenance and well rehabilitation or construction would occur as it has in the past for the 1996 through 2014 period. Although many KWB activities are regulated as described above, all infrastructure requires construction and maintenance, including the numerous production wells and monitoring wells on KWB Lands. Rehabilitation necessary to maintain the yield of production wells generally consists of the addition of chemicals to break down slime or iron bacteria mass or encrustation that reduce the size of the well perforations. Furthermore, unexpected chemical or other spills and overall construction activities near surface and groundwater sources have the potential to adversely affect groundwater quality. Therefore, impacts from KWB construction and maintenance activities from 2015 to 2035 on groundwater quality would be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.2-1 would reduce impacts of KWB activities with regard to potential changes to groundwater quality to less than significant. Furthermore, KWBA is subject to legal requirements regarding activities related to well drilling in section c) below (see Section 7.0.4.1.6). Therefore, impacts from KWB construction and maintenance activities from 2015 to 2035 on groundwater quality would be **less than significant, with mitigation**.

7.2-1 *KWBA will implement the following measures:*

- a) *Comply with Mitigation Measure 7.11-1(a).*
- b) *Comply with Mitigation Measure 7.8-1(a).*
- c) *Comply with Kern County Environmental Health Program under which new wells and well deepening, reconstruction, and destruction would be subject to permits requiring compliance. (see Section 7.0.4.1.6).*

7.2-2 **KWB operations could mobilize contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations and potentially degrade groundwater quality.**

1996 – 2014

As discussed in Section 7.11, Hazards and Hazardous Materials, there were several hazardous material sites located on or adjacent to KWB Lands between 1996 and 2014 that were remediated for pesticide and/or petroleum hydrocarbon contamination, or were still under investigation to determine the extent of release of contamination. Of these, there were two hazardous materials sites where a release to soils with the potential to impact groundwater or groundwater contamination was identified. These sites are shown on Figure 7.2-10. A summary of the hazardous material sites and corresponding observation points are presented in Table 7.2-8.

During KWB recharge and recovery operations, there was a potential for recharge water to come into contact with soil contamination causing it to leach or further disperse in soils or the underlying aquifer. Mobilization of soil contaminants could also occur by spreading recharge water on areas with soil contamination or through saturation of soils as a result of mounding and fluctuations of the groundwater table. Wetting and drying of the unsaturated zone that occurs as a result of recharge and recovery cycles can also cause geochemical oxidation and reduction reactions that could contribute to mobilization of constituents from soils to groundwater.

The process of leaching of soil contamination to groundwater is complex and dependent on several variables including how long the contamination was present, solubility of contamination in water, composition of soil, and the chemistry of recharge water in relationship to underlying groundwater.

Historic operations at the KWB during recharge periods of 1995-1998, 2005-2006, and 2011, in addition to recharge operations at other neighboring groundwater banks, resulted in periodic high groundwater elevations within KWB and surrounding areas. To evaluate potential mobilization of soil contamination or the migration of groundwater contamination as a result of high water level fluctuations, the minimum depth to water was simulated at 3 observation points corresponding to the hazardous waste sites using hydrologic model scenarios described in Section 7.1, Surface Water and Groundwater Hydrology. The frequency and duration of high water levels were then evaluated with respect to the nature and depth of residual soil and/or groundwater contamination.

Table 7.2-9 summarizes the number of months from 1996 to 2014 where the minimum simulated water level was less than 50, 25, or 0 ft bgs. (Hydrographs for each observation point are presented in Appendix 7-3 as Figures 7.3-31 to 7.3-33.)

Uhler Fire Training Facility Site (Observation Point 1)

From 1979 to 1990, a 6-acre property operated as an oil industry firefighting training facility. Petroleum contamination in soils and groundwater was first identified in 1996 and chlorinated solvents (TCE and PCE), arsenic, chromium, and lead were first identified in groundwater in 2006 above MCL concentrations. In 2011, approximately 10,000 tons of impacted soil was removed to approximately 18–35 ft bgs. In February 2012, CVRWQCB concluded that removal and remediation of impacted soil was complete. Groundwater monitoring in two wells continued following soil removal; however, it was limited because monitoring wells, which were screened between 20-60 ft bgs and 130-150 ft bgs, periodically went dry. In 2012, all constituents in shallow groundwater except for TRPH ranging 700 to 900 mg/L and TPH as diesel ranging from 190 to 205 mg/L were below applicable MCLs. According to recent regulatory correspondence, groundwater recharge and extraction activities conducted by KWBA are being closely monitored as part of the ongoing groundwater monitoring program for this site.⁴¹

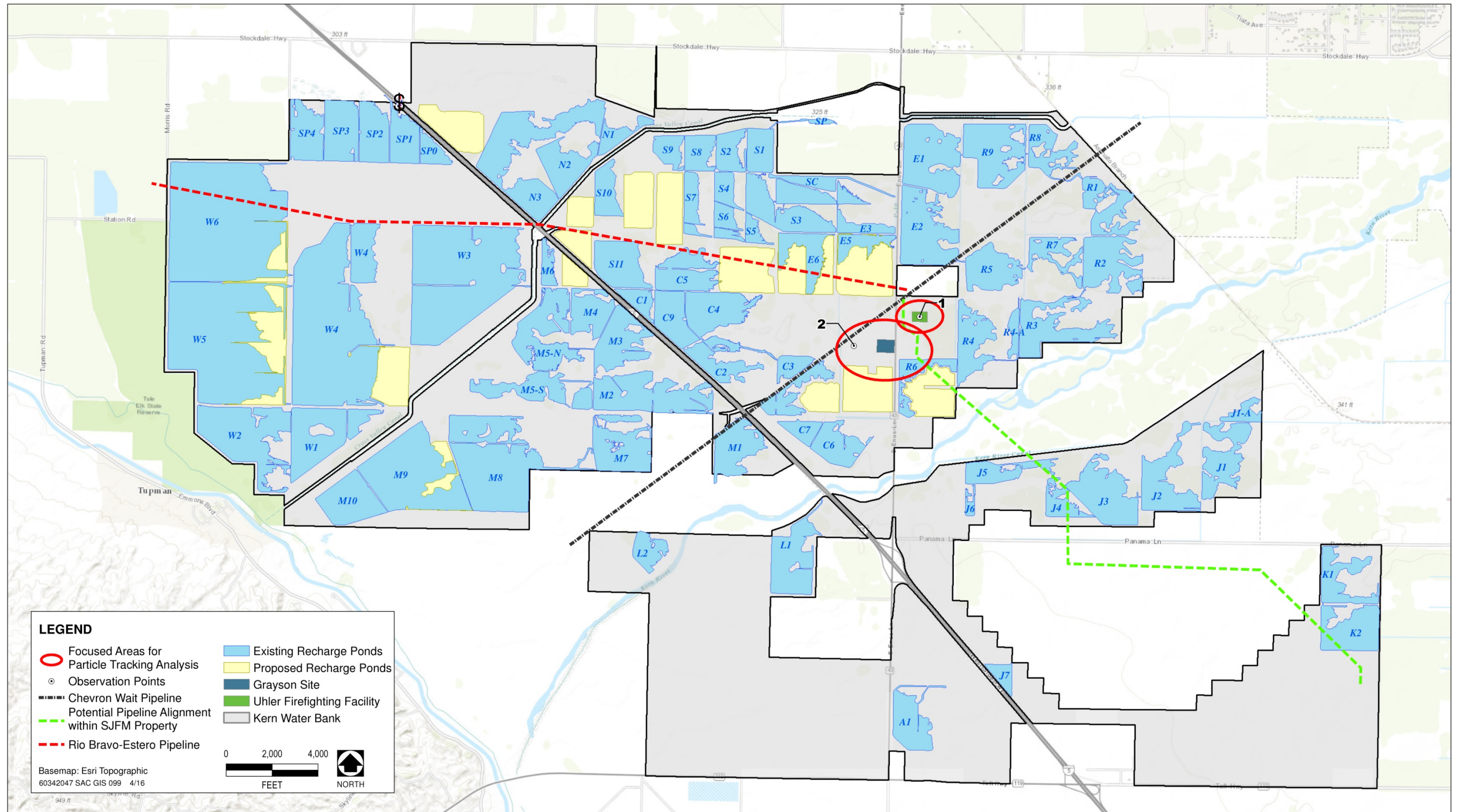
KWB along with neighboring groundwater banking recharge operations contributed to a rise in groundwater levels resulting in water potentially contacting contaminated soil between 1996 and 2014. The source of contamination was thought to have been removed in 2011.

Nearby wells were sampled for BTEX, PCE, and TCE (30S/25E-14K01, -11Q01, -13F01, -13L01 and -14J01) at various times from 2001 to 2012 with no detections except for ethyl-benzene at 1.9 µg/L in a 2002 sample from well 30S/25E-11Q01. There were no detections in subsequent 2005 and 2014 samples. Methyl tert-butyl ether (MTBE) analyses were also run in samples from -13F01, -13L01, and -14J01 and was only detected in a 2003 sample from -14J01 at 8.6 µg/L with no detections in subsequent 2006 and 2012 samples.

Particle tracking generated by the DWR KWB Model under the APO scenario shows that groundwater contaminants in the vicinity of the Uhler Fire Training Site would have remained within KWB Lands (see Appendix 7-3).

Grayson Site (Observation Point 2)

The site contains three concrete lined wastewater basins and possibly one unlined sump that were reportedly used for oil and wastewater storage. Cease and Desist and Cleanup and Abatement Orders (CAOs) were issued by the CVRWQCB regarding the disposal basins (called Ponds 1 through 4 in the CAO). This site remains in active case status with the CVRWQCB as a CAO (No. R5-2015-0730) requiring demonstration that the discharge to the ponds can comply with the applicable laws, policies, and regulations or the discharge will have to cease by December 31, 2016. Work outlined in the CAO may include a hydrogeological site characterization to assess the effects of the discharge of oil field wastes on underlying groundwater. The CAO states that if the discharger demonstrates that the wastes discharged to the ponds cannot affect the quality of the underlying groundwater, the Assistant Executive Officer may rescind by signed letter all or part of the requirements the groundwater investigation and groundwater monitoring portions of the CAO. A Work Plan for Proper Basin Closure, dated January 26, 2016, was submitted to CVRWQCB for three of the basins (noting that the fourth area was never used). The Work Plan included plans for breaking up and removal of the liner, excavation of any visual contamination, stockpiling and sampling and analysis of excavated stockpiled soil, composite sampling the floor of the impounds after excavation, and backfilling the impounds after CVRWQCB approval. The Work Plan contained no information about a hydrogeologic investigation or a groundwater monitoring and reporting program. The current status of Work Plan approval and implementation is not known.



Source: Sanberg 2015 and AECOM 2015

FIGURE 7.2-10. Location of Observation Points at Areas of Potential Contamination

TABLE 7.2-8

**SUMMARY OF HAZARDOUS MATERIAL SITES
WITH RESIDUAL SOIL OR GROUNDWATER CONTAMINATION, 1996-2014**

Site Name	Observation Points	Constituents of Potential Concern ¹	Depth to Potential Contamination
Uhler Firefighting Training Facility (Being Monitored) CVRWQCB – Removal and Remediation of Impacted Soil Complete – February 2012	1	Tetrachloroethylene (PCE), trichloroethylene (TCE), arsenic, chromium, lead, crude oil, benzene, toluene, ethylbenzene, and xylenes	Residual TPH soil contamination less than 100 mg/kg at 35 ft bgs. Samples taken in 2012 showed TPH above MCL. Shallow groundwater monitoring will continue as per RWQCB recommendations and/or when water level in the area allow.
Grayson Site – Under CVRWQCB CAO – Workplan for Basin Closure submitted January 26, 2016	2	Petroleum and oil field wastewater constituents, nitrates, and solvents	Unknown; surface discharge of oilfield wastewater into 3 concrete-lined ponds.
Notes:			
ft bgs = feet below ground surface; mg/kg = milligrams per kilogram; TPH = Total Petroleum Hydrocarbons			
1. Wastewater produced from oil fields may contain elevated concentrations of general minerals (especially total dissolved solids and chloride), metals (i.e., arsenic), trace elements (i.e., boron, strontium, thallium, lithium, etc.), petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs, i.e., benzene, toluene, ethylbenzene, and xylenes [BTEX]), and radionuclides (i.e., uranium)			

TABLE 7.2-9

**FREQUENCY OF MONTHLY OCCURRENCE OF
MODEL-GENERATED MINIMUM DEPTH TO WATER
AT OBSERVATION POINTS**

	1	2
APO WITH KWB¹		
DTW < 50 ft	58	58
DTW < 25 ft	20	22
Flooding (DTW < 0 ft)	2	2
AFO-EC WITH KWB²		
DTW < 50 ft	0	0
DTW < 25 ft	0	0
Flooding (DTW < 0 ft)	0	0
AFO-EC WITHOUT KWB²		
DTW < 50 ft	0	0
DTW < 25 ft	0	0
Flooding (DTW < 0 ft)	0	0
AFO-BC WITH KWB²		
DTW < 50 ft	20	25
DTW < 25 ft	5	6
Flooding (DTW < 0 ft)	0	0
AFO-BC WITHOUT KWB²		
DTW < 50 ft	0	0

TABLE 7.2-9

**FREQUENCY OF MONTHLY OCCURRENCE OF
MODEL-GENERATED MINIMUM DEPTH TO WATER
AT OBSERVATION POINTS**

	1	2
DTW < 25 ft	0	0
Flooding (DTW < 0 ft)	0	0

Notes:
 APO = Analysis of Past Operations, AFO-EC = Analysis of Future Operations - Existing Conditions; AFO-BC = Analysis of Future Operations - Buildout Conditions; KWB = Kern Water Bank; DTW = depth to groundwater
 1 Frequency of monthly occurrence from January 1996 to December 2014 (228 months)
 2 Frequency of monthly occurrence from January 2015 to December 2035 (252 months)
 Source: Section 7.1, Surface Water and Groundwater Hydrology

Water quality data from nearby wells did not show petroleum hydrocarbons, VOCs, or SVOCs within detection limits.

Groundwater is generally greater than 50 ft bgs; however, simulated groundwater reached flooding conditions (water levels at ground surface) for 2 months in 1996. Water levels have been consistently below 75 ft bgs since late-2011 (see Appendix 7-3, Figure 7.3-9).

The extent of soil and groundwater contamination from site activities is presently unknown. Because the site is adjacent to a KWB recharge pond (R6 on Figure 7.2-10), potential soil and groundwater contamination, if present, could have been mobilized if groundwater reached potential contamination zones. However, particle tracking generated by the DWR KWB Model for the APO scenario shows that groundwater contaminants in the vicinity of the Grayson Site, if present, would have remained within KWB Lands. KWB recovery wells capture groundwater in the vicinity of the Grayson Site, and analytical testing from the recovery wells has not shown detectable levels of petroleum compounds or chemicals associated with hazardous waste.

Conclusion

Particle tracking generated by the DWR KWB Model shows that groundwater contaminants in the vicinity of the two sites (Uhler Firefighting Facility and Grayson Site) would have remained within KWB boundaries. Particle tracking results are included in Appendix 7-3 in Figure 7.3-6 A&B (APO with and without the KWB). Particle paths (and movement of potential COCs) would be minimal and limited to about a mile from any of the two sites during past KWB operations.

As summarized in the analysis above, KWB operations under the Analysis of Past Operations (APO) scenario using the DWR KWB Model contributed to the rise in the groundwater table potentially resulting in groundwater coming in contact with contaminants between 1996 and 2014. This may have resulted in groundwater degradation at the Uhler Fire Training Facility site (soil remediation considered complete by CVRWQCB but groundwater monitoring needed to be continued) and the Grayson Site (currently under a CVRWQCB CAO) with work in progress. However, particle tracking model results indicated that any potential contaminants from these sites would have traveled about 0.25 mile with KWB recharge and recovery and about 0.5 mile without KWB recharge and recovery operations since 1996. Furthermore, water quality data available between 1996 and 2014 do not show evidence that KWB recharge and recovery operations have mobilized potential contamination in soils or the unsaturated zones associated these sites potentially degrading groundwater quality.

Therefore, the impact of KWB operations during 1996 to 2014 in relation to these sites on groundwater quality was ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Future KWB recharge and recovery operations would be similar to 1996 to 2014 activities; however, recharge and recovery operations would be increased with the addition of planned recharge ponds, recovery wells, and ancillary facilities. Impacts of KWB recharge operations on groundwater quality associated with hazardous material sites during future recharge operations during the periods of 2016–2019, 2026–2027, and 2032 (using the DWR KWB Model under Analysis of Future Operations – Existing Conditions and Buildout Conditions [AFO-EC and AFO-BC, respectively] are similar to 1995–1998, 2005–2006, and 2011 hydrologic conditions, respectively. Potential impacts were evaluated by analyzing the minimum water levels at the two observation points (see Table 7.2-9) using the DWR KWB Model. (Hydrographs presenting AFO-EC and AFO-BC water levels with and without KWB operations for each observation point are presented in Appendix 7-3, Figures 7.3-10 and 7.3-11, respectively.

Under the AFO-EC scenario, groundwater levels would rise during recharge periods; however, due to substantial lowering of the water table from the multi-year drought, groundwater levels may not recover to historic water levels. Consequently, groundwater levels could be lower than 1996-2014 conditions.

Recharge operations under the AFO-BC scenario would result in higher groundwater elevations than under the AFO-EC scenario. The AFO-BC scenario includes approximately 1,052 acres of planned recharge ponds (190 acres as part of the IRWM project and 862 acres as part of full build-out), which would result in recharge and recovery of more water.

Hazardous materials sites are subject to Kern County Environmental Health Services Division requirements and CVRWQCB requirements for the protection of water quality. The Kern County Environmental Health Services Division administers programs to ensure that hazardous materials are handled and managed in ways that are safe and protective of workers and the environment. These programs include: Hazardous Materials Business Plans, Hazardous Waste Generator / Tiered Treatment, underground and above-ground petroleum storage tanks, and the California Office of Emergency Services' Accidental Release Prevention Program. The CVRWQCB is responsible for state water quality. This includes oversight and working with potentially responsible parties for soil and groundwater cleanup.

Uhler Firefighting Training Facility (Observation Point 1)

The Uhler Firefighting Training Facility has an ongoing groundwater monitoring program under the oversight of the RWQCB which is being routinely reviewed by KWBA.

Under AFO-EC operations, an evaluation of the depth to water at observation point 1 indicates that water levels are not anticipated to rise above 50 ft bgs between 2015 and 2035 with or without KWB operations. Particle tracking analysis from the DWR KWB Model shows that contaminants, if present, would remain within KWB Lands and that groundwater particles (and movement of potential COCs) would be minimal and limited to about 0.25 mile (with KWB) and to about 0.5 mile (without KWB) from the Uhler site during future KWB operations (see Appendix 7-3 Figure 7.3-7A&B AFO-EC with and without KWB).

Under AFO-BC with KWB operations, groundwater levels are projected to be approximately 18 ft bgs for minimal periods of time. Table 7.2-9 indicates that groundwater levels under the AFO-BC would only rise above 50 feet bgs during 20 months and above 25 feet bgs during 5 months of the 252-month period (January 2015 to December 2035). Under the AFO-BC without KWB operations, groundwater was never simulated to rise above 50 feet bgs. Similar to AFO-EC, AFO-BC particle tracking analysis indicates that contaminants, if present, would remain within KWB Lands and groundwater particles (and movement of potential COCs) would be minimal and limited to about 0.25 mile (with KWB) and 0.5 mile (without KWB) from the Uhler site during future KWB operations (see Appendix 7-3 Figure 7.3-8A&B AFO-BC with and without KWB).

Grayson Site (Observation Point 2)

Under the AFO-EC with or without the KWB scenario, DWR KWB Model results for depth to water analysis at observation point 2 indicate that water levels are not anticipated to rise above 50 ft bgs (see Table 7.2-9). The presence or extent of potential soil and groundwater contamination will remain unknown until work under the existing CAO is implemented; however, groundwater contamination has not been found in water sampling from nearby wells.

Under the AFO-BC with the KWB scenario, DWR KWB Model results indicate that groundwater levels at observation point 2 is predominantly below a depth of about 50 ft bgs. However, modeled water levels are anticipated to rise above 50 feet bgs during 25 and above 25 feet bgs during 6 of 252 simulated months during the AFO-BC with KWB simulation only. The shallowest water level is simulated to be approximately 13 ft bgs. Groundwater levels are not expected to rise above 50 feet bgs for the AFO-BC without the KWB scenario.

There is an existing KWB recharge pond located adjacent to the southeast of the basins identified in the CAO, and several proposed ponds would be located approximately 1,000 feet or more from the site.

Under both the AFO-EC and AFO-BC scenarios with and without the KWB, particle tracking generated by the DWR KWB Model shows that groundwater flow in the vicinity of the Grayson Site remains within KWB Lands (see Appendix 7-3); Figures 7.3-7A&B (AFO-EC) and 7.3-8A&B (AFO-BC) show that groundwater particles (and movement of potential COCs, if present) would be minimal and limited to about 0.25 mile (with KWB) and to about 0.5 mile (without KWB) during future KWB operations.

Conclusion

As summarized above, KWB operations under AFO-EC and AFO-BC (with the KWB) conditions, would only result in groundwater levels that could rise above 50 ft and 25 ft bgs for limited periods of time with the potential to mobilize some COCs. For AFO-EC and AFO-BC without the KWB groundwater levels are not expected to rise above 50 feet bgs. Particle tracking results indicate that groundwater particles (and COCs, if present and mobilized) would remain within a mile of the two sites of concern (the Uhler Firefighting Training Facility (OP 1), and the Grayson Site (OP 2)). Both sites are under CVRWQCB oversight with remediation of impacted soil considered complete (February 2012) and groundwater monitoring continuing at the Uhler Firefighting Training Facility and work just starting to be implemented under a CAO (issued August 15, 2015) at the Grayson Site respective to soil and groundwater contamination associated with three onsite oil field production wastewater holding ponds.

Therefore, the impact of KWB operations from 2015 to 2035 in relation to the two sites on groundwater quality would be **potentially significant** until such time that the CVRWQCB indicates that groundwater under the Uhler Firefighting Training area is not impacted and that soil and/or groundwater under the Grayson Site is not impacted.

Mitigation Measures

Mitigation Measure 7.2-2 would reduce impacts of KWB activities with regard to mobilization of contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations to less than significant. KWBA is obligated to carry out the measures relating to its actions in subsections b), c) and d) below (Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, the impact of KWB activities from 2015 to 2035 with regard to exposing workers or the public to previously unidentified hazards or hazardous materials would be **less than significant, with mitigation**.

7.2-2 *KWBA will implement the following measures:*

- a) *Comply with Mitigation Measure 7.11-3.*
- b) *Hazardous waste sites would be subject to the county public health department and/or the CVRWQCB oversight with the responsible parties (see Section 7.0.4.1.7). KWBA will cooperate with the regulatory agency(s) during the process and provide pertinent groundwater elevations and water quality data the regulatory agencies may request.*
- c) *On an annual basis, KWBA shall report the status of shallow groundwater level monitoring activities and water quality analysis in areas of contamination to the Kern Fan Monitoring Committee.*
- d) *KWBA will continue to monitor and evaluate the nature and extent of any current and future contamination and remediation within KWB Lands as follows:*
 - (i) For all evaluation and monitoring activities performed by third parties on KWB Lands, KWBA shall obtain reports and sampling data as soon as they become available. Monitoring and evaluation shall continue until verification by third party documentation, regulatory correspondence, and/or laboratory analysis is obtained that indicates soil or groundwater contamination has been remedied and no longer provides a threat to groundwater quality.*
 - (ii) On an annual basis, KWBA shall report the status of contamination for each issue and provide water quality data monitoring activities, where available, to the Kern Fan Monitoring Committee. Any newly discovered contamination shall be reported to the Kern Fan Monitoring Committee immediately.*

7.2-3 **The operation of oil and gas production wells within and surrounding KWB Lands could potentially degrade the quality of KWB water supplies.**

1996 – 2014

KWB Lands are situated across four active oil and gas fields: Coles Levee, North; Strand Oil Field; Ten Section Oil Field; and Canal Oil Field. As shown in Table 7.11-2 in Section 7.11, Hazards and Hazardous Materials, there are 31 active, 11 idle, and 152 abandoned oil and gas wells on KWB.

While these oilfield wells are situated on KWB, they are not operated or associated with KWB operations or with KWBA. The wells are operated by third parties holding mineral rights or leases. KWB is located in an area of active oil and gas production and well stimulation activities although stimulation activities are not being done on wells within the KWB boundaries.

Oil and gas production and well stimulation activities are regulated by the Division of Oil, Gas & Geothermal Resources (DOGGR).(See Section 7.0.4.1.8) The DOGGR regulatory program emphasizes sound engineering practices that protect the environment, prevent pollution, and ensure

public safety. All California oil and gas wells, enhanced-recovery wells, and water-disposal wells are permitted, drilled, operated, maintained, plugged and abandoned under requirements and procedures administered by DOGGR. Other agencies like the CVRWQCB and the State and County Fire Marshal provide oversight for specific activities within their jurisdiction. The responsibilities of DOGGR are identified in CCR Title 14, division 2, Chapter 4, and include well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines.

Well stimulation activities are not known to have occurred in oilfield wells located on KWB Lands between 1996 and 2014. Two stimulation wells were identified at locations outside of KWB, near its southwest corner. Sampling of the nearest groundwater recovery wells is required as part of compliance for well stimulation activities. Central Resources, Inc. will sample existing KWB recovery well 19R-1 and West Kern Water District wells 28E-04 and 2-02 as part of the monitoring program.

Two wells are located on KWB Lands that inject oil field brines at depths ranging from 2,360 to 3,870 feet bgs. Injection wells are subject to regulation by the DOGGR Class II Underground Injection Control (UIC) program, which enforces the requirement of the federal Safe Drinking Water Act. There are no reports of leaks from these wells.

There is a single wastewater injection well not located on KWB Lands (well WD 2-31 – located in T30S/R26E – Section 31) that showed casing leakage at a depth between 812 feet to 817 feet during a pressure test in 2010. The leakage was corrected following testing in 2010. It is unknown how long the leak was present. The casing leak was located in the deeper zone of the freshwater aquifer below what is considered to be the main producing zone and screened intervals of most recovery wells. The nearest KWBA monitoring well in the deep aquifer, well 30S/26E-32N03, indicated relatively stable concentrations of TDS from 1996 through 2014. WD 2-31 has been routinely pressure tested and there is no indication of distinct changes in groundwater quality in the vicinity of the injection well; groundwater quality degradation associated with the injection well leak is considered to be less than significant. Annual mechanical integrity tests are performed to confirm that oil field brines have not contaminated overlying freshwater aquifers.

As shown in Table 7.11-3 in Section 7.11, Hazards and Hazardous Materials, several former oil wells or dry holes are located within existing recharge ponds. These wells are identified by DOGGR as plugged and abandoned. A review of available reports for wells shown on the table indicates that they were plugged and abandoned in accordance with regulated practices and in a manner that would preclude vertical movement along the well casing between the deeper oil-producing zone and the upper fresh water aquifer.

Older wells not properly plugged or abandoned by today's standards may lack plugs at the base of the freshwater aquifer or near the ground surface. Improperly plugged abandoned wells could serve as conduits for the vertical movement of oil brines or petroleum constituents or surface pollutants into the freshwater aquifer. According to DOGGR files, only one well had no abandonment record. This well is not located near KWB facilities. Sampling of monitoring and recovery wells on and around KWB Lands has not shown the presence of constituents associated with petroleum contamination.

Therefore, the impacts of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies during 1996 through 2014 were ***less than significant***.

2015 – 2035

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing IRWM program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and

associated facilities is anticipated as part of full build-out. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. Locations of additional ponds are approximate but will be consistent with the KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

Future KWB recharge and recovery operations would be similar to 1996 through 2014 activities; however, recharge and recovery operations would be increased slightly with the addition of new facilities. Third party oil and gas production, wastewater injection, and well stimulation activities within and surrounding KWB Lands are expected to continue in 2015 through 2035 in the same manner as during 1996 through 2014.

As shown in Figure 7.11-2 in Section 7.11, Hazards and Hazardous Materials, future recharge ponds are proposed in areas of plugged and abandoned oil production wells. Typical construction of oil wells includes an upper casing and cement seal from ground surface to a depth of approximately 500 feet. Groundwater level changes during recharge or recovery from KWB operations have maximum depths of approximately 250 feet. Changing water levels from KWB activities would not significantly impact active or abandoned oil wells.

Construction of recharge ponds may potentially damage the near surface portion or the top of plugged or abandoned wells and well casing failures during oil and gas production, wastewater injection, and/or well stimulation could cause a release of petroleum constituents, oil field brines, and/or well stimulation fluid into the freshwater aquifer, which may substantially degrade groundwater quality.

Therefore, the impacts of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies during 2015 to 2035 could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.2-3 would reduce impacts of KWB activities within oil and gas operational areas within KWB Lands to less than significant. KWBA is obligated to carry out the measures relating to its actions in subsections a) and b) (Section 7.0.4.3.2, 2016 KWBA Resolution) and subject to legal requirements in subsection c) (section 7.0.4.1.7) below. Therefore, the impact of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies in the future would be ***less than significant, with mitigation***.

7.2-3 *KWBA will implement the following measures:*

- a) *Prior to construction, identify all plugged and abandoned wells through agency contacts. This includes identification of abandoned wells through the DOGGR website, field verification of an abandoned well prior to construction, notifying DOGGR of intent to construct a recharge pond adjacent to or over an abandoned well.*
- b) *Modify excavation and grading activities to ensure the near surface seals and wellhead remain undamaged.*
- c) *If the top of an abandoned well or wellhead is damaged during pond construction, appropriate authorities (i.e., DOGGR, CVRWQCB, and/or Kern County Environmental Health) will be notified as to the nature and extent of the damage along with plans to repair the damage, as needed and in accordance with existing regulations.*

7.2-4 **KWB recharge and recovery operations could potentially change water quality in the underlying aquifer as a result of lateral and vertical migration of low quality water within and outside the limits of the KWB.**

During periods of recharge, groundwater levels rise and groundwater flow is outward from the KWB recharge mounds. During periods of recovery, water levels are depressed and groundwater flows inward. Recharge and recovery water level effects dissipate with distance. These effects are dynamic and variable depending on duration, volume, and location of recharge and/or recovery operations. At times, only recharge or recovery is occurring. At other times, both occur in the same year and the effects overlap each other. Groundwater levels in response to recharge and recovery can fluctuate from near land surface to depths of more than 300 feet below land surface.

Groundwater levels rose when KWB recharge operations were predominant (e.g., 1995-2000) and declined during periods when KWB groundwater recovery was dominant (e.g., 2001, 2007-2010). Near the end of the 2007-2010 recovery period, groundwater levels dropped below historical low levels in most areas. In some wells, groundwater levels decreased as much as 90 feet below the previous year's historical low level. During periods of active recharge, groundwater flow is primarily southeast to northwest beneath the northern portion and northwest to southeast beneath the southern portion of the KWB.

Water levels provide the driving force for groundwater flow and migration of dissolved constituents. When groundwater levels are high, flow direction is outward from the KWB. When water levels are low, groundwater flows radially inward toward the KWB.

Analysis Approach

Four methods were used to assess potential groundwater lateral and vertical migration of low-quality water: 1) reviewing Areas of Groundwater Quality Concern maps prepared by the KFMC and those prepared for this REIR, 2) developing and reviewing time versus concentration graphs to determine if individual dissolved constituent change over time and if they change with respect to other constituents nearby or within the same well, 3) comparing the concentration graphs with groundwater hydrographs, and 4) conducting particle tracking modeling to assess whether changes in chemical concentrations in a well correlate with past and modeled trends in surrounding wells. Each of the four methods were used to analyze lateral migration. Vertical migration was assessed by comparing time concentrations of various COCs for three identified depth zones (shallow, middle, and deep).

Areas of Groundwater Quality Concern Maps

Two sets of maps summarize water quality for KWB and surrounding areas. The first set of maps prepared by KFMC and titled, *Areas of Groundwater Quality Concern*, present data for 1995 (see Figure 7.2-3) and 1998-2009 (see Figure 7.2-4) for selected COCs: TDS, fluoride, arsenic, EDB, nitrate, uranium, and DBCP. The maps are regional in scale and extend from Highway 99 in the east to Elk Hills in the west. The second set of maps prepared for this REIR show wells sampled from 1995 through 2015 for TDS, arsenic, nitrate as NO₃, alpha, and uranium where one or more well samples exceeded the MCLs (see Figures 7.2-5 through 7.2-9). These COCs were selected based on a preliminary review of water quality data.

In the sampling program conducted by KFMC and KWBA, two types of wells are sampled: groundwater bank recovery wells and monitoring wells located across KWB and extending several miles beyond KWB Lands. Monitoring wells typically include three depth zones: shallow, middle, and deep. Water quality test results are summarized on maps for wells which exceeded the MCLs for the five COCs.

The maps described above were used to determine whether there are areas with low-quality water for one or more COCs and for which groundwater migration could impact either the recovery program or offsite areas.

Time-Concentration Graphs/Hydrographs

Individual well time/concentration graphs for TDS, arsenic, nitrate, alpha, and uranium from wells where one or more samples since 1995 were found to exceed the MCL are included at the end of Appendix 7-3. These graphs are listed in order of township, range and section; see Figures 7.2-5, 7.2-6, and 7.2-7 for TDS, arsenic, and nitrate as NO₃ respectively, and Figures 7.2-8 and 7.2-9 for alpha and uranium, respectively. Time/concentration graphs were also developed for a select set of wells located along the perimeter of KWB Lands as introduced in Appendix 7.3, Section 7.3-4. These wells are shown on Figure 7.3-1. This data set includes groupings of wells set on one time/concentration graph for:

- Arsenic - Figures 7.3-3A (Shallow Zone 0-50 µg/L); 7.3-3B (Shallow Zone 50-400 ug/L), 7.3-3C (Deep Zone 0-80 µg/L); 7.3-3B (Deep Zone 80-200 ug/L)
- NO₃ – Figures 7.3-4A (Shallow Zone), 7.3-4B (Middle Zone), and 7.3-4C (Deep Zone)
- TDS – Figure 7.3-5A (Shallow Zone), 7.3-5B (Middle Zone), and 7.3-5C (Deep Zone)

These are followed by combined alpha and uranium plots for single select wells from that data set.

Hydrographs for the wells included on Figure 7.3-1 are included on Figures 7.3-2-1 to 7.3-2-14. In addition, hydrographs from select wells used for KWB water level monitoring were generated for wells and areas within and adjacent to the KWB. These wells are identified in Appendix 7-3, Figure 7.3-12, with hydrographs shown on Figures 7.3-13 to 7.3-40.

Evaluation of Select Wells

Well cluster 30S/24E-13D is located in the western portion of KWB. Well 30S/24E-13D01 (shallow well – screen interval 150-250 ft bgs), -13D02 (middle well – screen interval 320-360 ft bgs), and -13D03 (deep – screen interval 520-650 ft bgs) – Hydrograph Figure 7.3-15 for the 13D hydrograph). These select wells had MCLS exceeded for certain COCs and show the following trends:

- In 13D01 TDS and NO₃ concentration trends generally followed one another (rising and falling together) indicating changes in water quality with a generally rising concentration trend until 2006 and then a generally decreasing trend with the exception of a rise in arsenic in a late-2012 sample. TDS values ranged from approximately 500 mg/L in late 1996, increasing to approximately 1,300 mg/L in 2006, and declining to approximately 550 mg/L in 2013. NO₃ followed a similar pattern starting at 2 mg/L in 1996, rising to 26 mg/L in 2006, and declining to approximately 8 and 17 mg/L in late 2011 and late 2012.
- In 13-D02, TDS and NO₃ concentrations followed similar trends (TDS range of 340 mg/L to a high of 800 mg/L in 2006 and 2009 with a decline to 500 mg/L in 2014; NO₃ below detection in late 1996 to a peak of 8 mg/L in 2009, with a follow-on decline).
- In 13-D03, TDS followed less pronounced changes in concentration over time. TDS ranged from a low of 360 mg/L to a high of 550 mg/L, with overall concentrations that tended to be more stable than those in the shallow and middle zones. NO₃ concentrations tended to be low (near the detection limit) and more stable than that in the shallow and middle zones.
- Arsenic (only detected in the shallow and deep zones) stayed at relatively low concentrations in both wells and did not appear to be affected by changing water levels.
- Alpha in the shallow zone well appears to follow the same concentration peak pattern as that for TDS and NO₃.
- Changing trends in concentration of TDS and nitrate suggest that water quality in the -13D cluster, in the shallow and middle zones, may be responding to a change due to mixing of recharge and recovery water.

During recharge operations, groundwater levels rise, causing a downward and laterally outward movement of groundwater. Mixing of recharge water and groundwater occurs along the interface between the two. Recovery operations result in pumping water from the deeper part of the aquifer and a further mixing of water. This mixing results in changes in concentrations of COCs over time. Mixing is variable and dependent on location of effective recharge, volume and duration of recharge, and the location, pumping rate, volume, and duration of recovery operations. Beyond natural lateral and vertical groundwater movements, both flow components would be enhanced during recharge and recovery operations, further distributing a mix of natural and recharge water across KWB Lands.

Well 30S/26E-32N01 is located in the southern portion of KWB. In Appendix 7-3, Figures 7.3-3B, 7.3-4A, and 7.3-5A show concentrations for arsenic, nitrate, and TDS, respectively, at well 30S/26E-32N01. This is also shown as a separate well in the arsenic/nitrate/TDS 30S/26E time/concentration graphs at the end of Appendix 7-3. Arsenic is shown to have two distinct peaks, one in 1998, and the other in 2005, while the TDS and nitrate time-concentration graphs show no change for those time periods. The two periods of elevated arsenic concentration do not correspond with groundwater level changes shown on the hydrographs. It can be inferred that the changes in arsenic concentration in that well are not due to lateral groundwater migration but to some other effect.

Well cluster 30S/25E-12B is located in the northern portion of KWB. Appendix 7-3 Figures 7.3-2-3 through 7.3-2-14 show the response of groundwater levels to recharge and recovery cycles. There are three identified major recharge and recovery cycles shown on the figures. Recharge cycles are identified by higher groundwater levels and recovery cycles are identified by periods of low groundwater levels. The three cycles were compared to the time-concentration graphs to assess potential correlation between changing groundwater levels and changing chemical concentrations. For well cluster 30S/25E-12B02 (shallow), 03 (middle), and 04 (deep), the hydrograph is shown in Figure 7.3-2-5 which indicates three major peaks in the water level (one in 1998, the second in late-2007 and early-2008, and the third in 2011/2012). Time/concentration graphs for this cluster are included in Appendix 7.3 Township 30S/Range 25E. these select wells had MCLs exceeded for certain COCs and show the following trends:

- For - 12B02 (shallow well), while there is a TDS peak in the 1997-1998 timeframe, there is no indication of concentration increases in 2007/2008 or in 2011/2012 although there is a slight rise in TDS starting in 2010. TDS concentrations appear to continually decline after 1997 which may be an indication that recharge and recovery operations are either diluting the existing TDS or removing TDS over time. Note that the 1997 high for TDS was 5,200 mg/L stabilizing around the MCL of 500 mg/L.
- 12B02 NO₃ concentrations slightly increased from 1997 to 2008 ranging from 20 mg/L to 32 mg/L. After 2008, there has been a steady decline dropping to approximately 10 mg/L.
- 12B02 Arsenic concentrations declined from a high of 41 ug/L in 1996 to low concentrations (with a few non-detects).
- For - 12B03 (middle zone), elevated TDS and nitrate concentrations are not seen in the prior to 1998. After that, there was a slow increase in TDS and NO₃ with a peak in the 1998/1999 period, a short decline after that, and a rise again in 2012, roughly corresponding to the 2011/2012 rise in water levels.
- For - 12B04 (deep well), no concentration trends are apparent that may be in response to increasing or decreasing water levels during recharge and recovery. Concentrations for TDS and nitrate in this well remain relatively stable with a very slow rise starting in 2005. TDS has ranged around 120 mg/L while NO₃ has ranged below 5 mg/L. Arsenic has had two peak concentration periods, of 38 ug/L in 1999 and of 39 ug/L in late 2003. Only the 1998 water level rise appears to correlate to the elevated 1998 arsenic concentration. Elevated water levels in 2007/2008 and 2011/2012 do not appear to have an effect on arsenic concentrations. Arsenic

concentrations appear to have been on a steady decline in this well since 2004 with no apparent relation to changes in groundwater levels.

Particle Tracking

Particle tracking was conducted using the DWR KWB Model to assess the potential distance a particle of groundwater may travel from the KWB boundary under various operating conditions. This could be used to assess potential COC movement beyond the boundary of KWB Lands. The scenarios evaluated were:

- APO – Analysis of past operations (1995 through 2014) with and without KWB recharge/recovery operations.
- AFO-EC – Analysis of future operations under existing conditions (2015 through 2035) with and without KWB recharge/recovery
- AFO-BC – Analysis of future operations under full project build out (2015 through 2035) with and without KWB recharge/recovery

Figure 7.2-11 shows APO results and Figures 7.2-12 and Figure 7.2-13 show AFO-EC and AFO-BC results, respectively. Figure 7.2-11 shows the migratory path of water particles from 1995 through 2014 for the APO “With KWB Operations.” An example from Figure 7.2-11 is the set of particles placed on the western property line that trace the path of groundwater from the property line outward in a northwesterly direction during periods of recharge and follow a return path to the bank during periods of recovery.

Particle tracking was used to assess whether groundwater from areas of poor quality water could migrate and affect offsite pumping wells.

The movement of water particles were simulated using the MODPATH particle tracking model and incorporating flow and velocity vectors of the DWR KWB Model. For the APO evaluation, Figure 7.2-11 illustrates migration zones (with and without KWB Operations) of water molecules located at the KWB boundary at the start of the simulation period. Each particle path starts at a box at the KWB boundary. The line extending from the box is the particle path-line with the endpoint being the farthest extent of travel noting that during the migration period particles can move outwards in response to recharge and inwards in response to recovery. The figure illustrates that without KWB operations, movement of water particles are influenced by the operations of neighboring water banks, but travel shorter distances away from KWB boundaries when compared to that with KWB operations. Figure 7.2-11 shows that water particles move in the direction of groundwater gradient with little lateral movement. For example, a particle at the northwest corner of KWB boundary would move in a northwest direction. Figure 7.2-11 shows that a water molecule at the start of the simulation period would not migrate beyond 1.5 mile of the KWB boundary.

Similar to the APO, particle tracking scenarios for the AFO-EC and AFO-BC are shown on Figures 7.2-12A&B and 7.2-13A&B. All three particle tracking simulations show similar results over each simulation period.

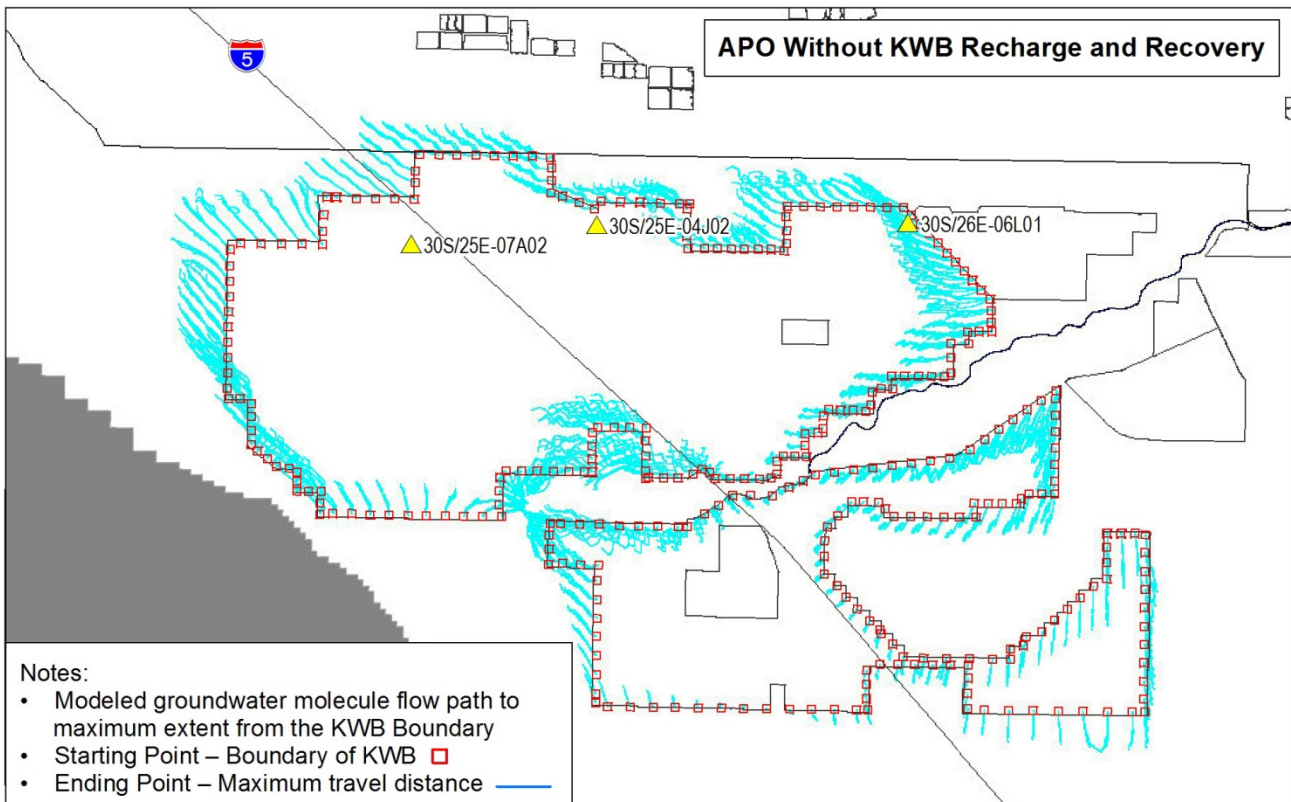
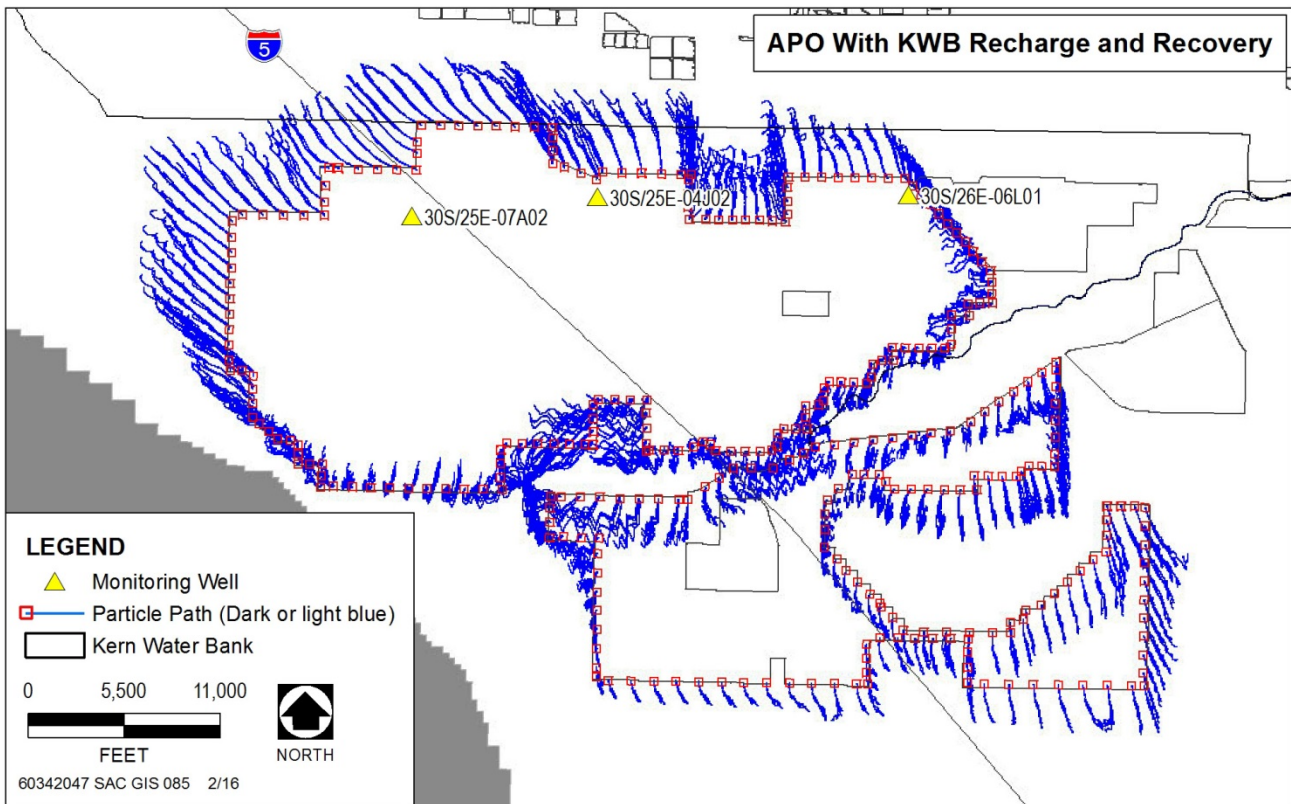


FIGURE 7.2-11. APO Particle Tracking Results with and without KWB Operations, 1995-2014

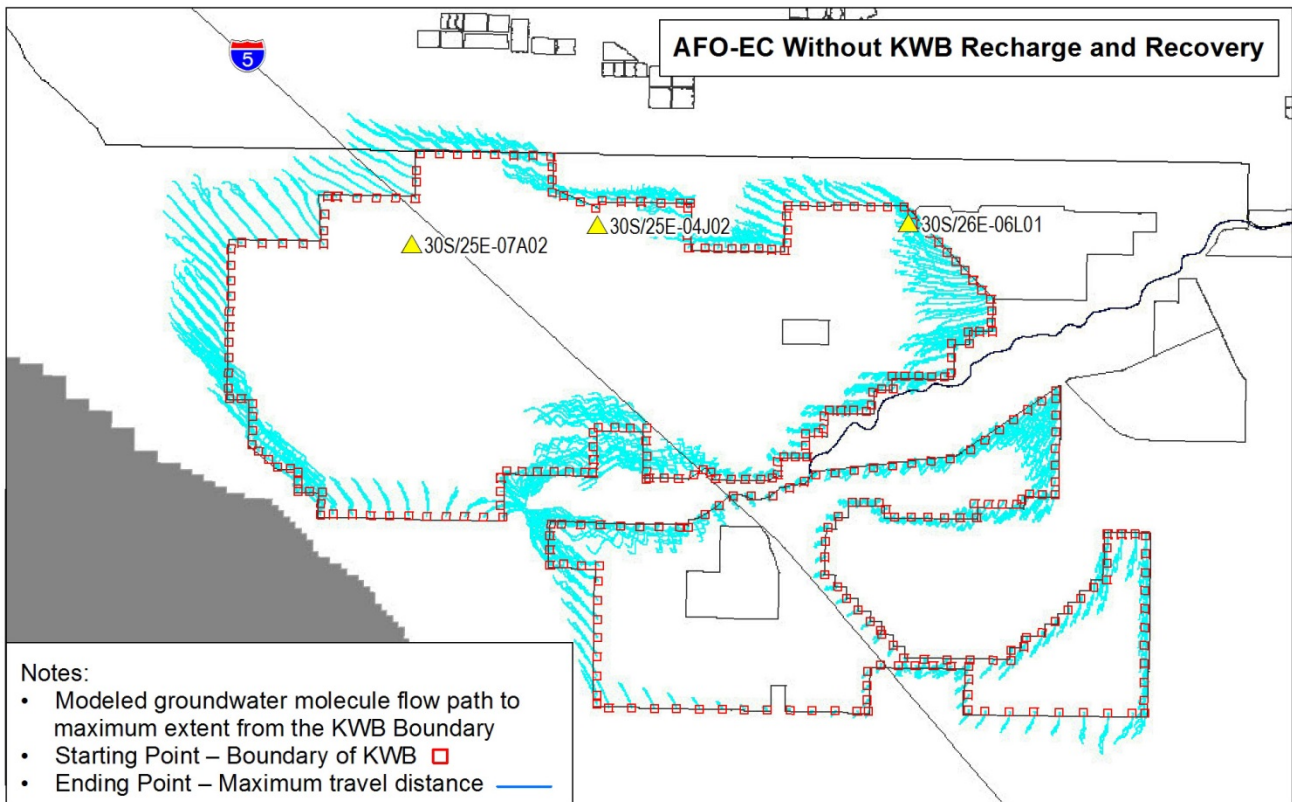
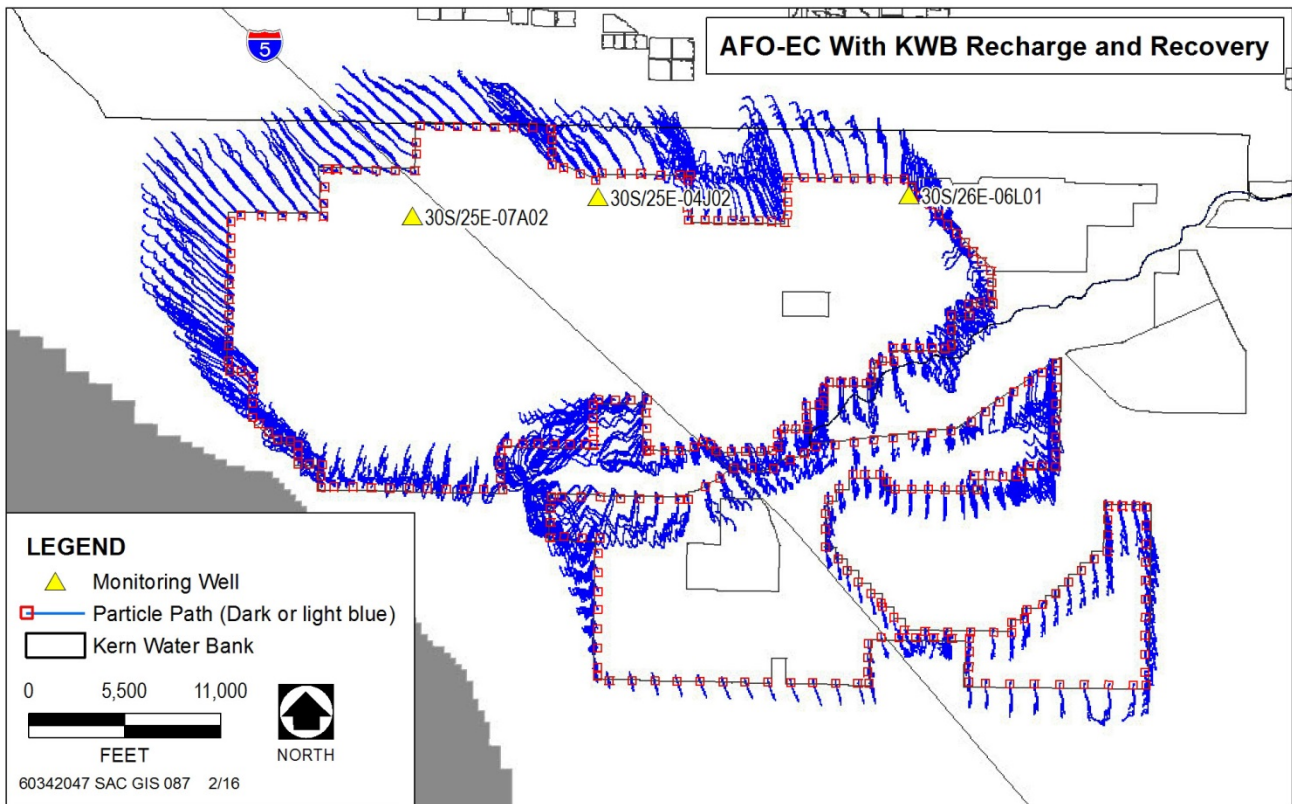


FIGURE 7.2-12. AFO-EC Particle Tracking Results with and without KWB Operations, 2015-2035

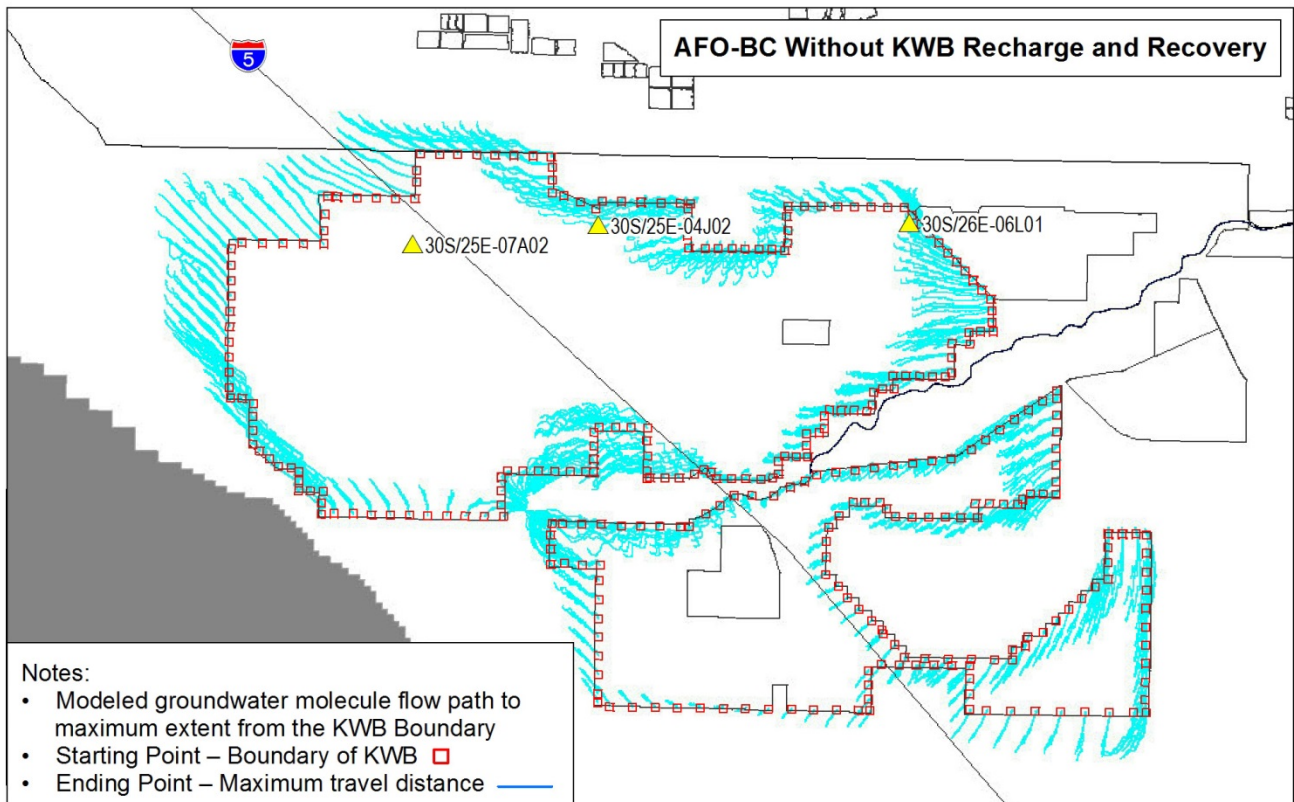
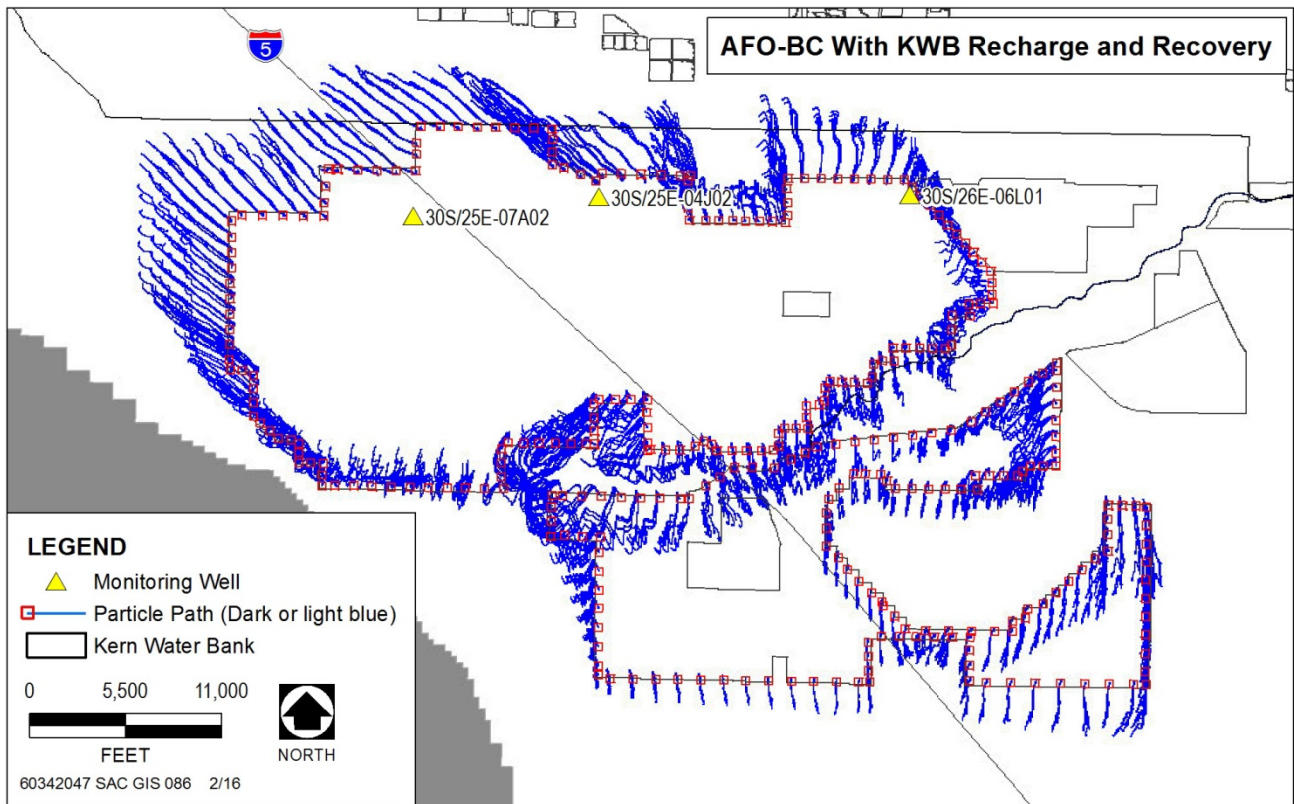


FIGURE 7.2-13. AFO-BC Particle Tracking Results with and without KWB Operations, 2015-2035

1995 – 2014Areas of Groundwater Quality Concern Maps

Figures 7.2-3 and -4 identified three COCs present on or bordering KWB Lands: TDS, uranium, and arsenic. Figures 7.2-5 through 7.2-9 show well data relative to MCLs from 1995 through 2014 for TDS, arsenic, nitrate as NO₃, alpha, and uranium, respectively. These figures show wells with one or more occurrences where a sample exceeded its MCL for selected COCs. The figures should be used in conjunction with Appendix 7-3 time/concentration graphs to determine both concentration values and trends.

Figure 7.2-5 shows that areas of elevated TDS are located on the west to southwest one third of KWB Lands extending from the Elk Hills eastward into the valley. A second area of elevated TDS is located in the northeastern portion of KWB Lands.

Figure 7.2-6 suggests that arsenic has no clearly apparent pattern other than it appears to be more widespread at and east of I-5 in the deepest parts of the aquifer system during times of recovery.

Figure 7.2-7 shows that nitrate as NO₃ was not detected above the MCL in wells within KWB Lands.

Figure 7.2-8 (alpha) and Figure 7.2-9 (uranium) suggest that alpha is distributed in a wide west-southeast to east-northeast band north of the Kern River, and uranium was not as frequently detected as alpha so the distribution is not as well-known but appears to follow the pattern of alpha.

Hydrographs and Time/Concentration Graphs

Figure 7.3-12 in Appendix 7.3 is a map showing location of wells in the KWB area that are used for Kern Fan monitoring. The hydrographs (Figures 7.3-13 to 40) from these wells show changes in water level over time and can be used in identification of water level trends. These wells were selected to give an overview of historic water level trends for use with time/concentration graphs.

Time/concentration graphs have been prepared for TDS, arsenic, nitrate, alpha, and uranium for wells where one or more samples were found to exceed a respective well MCL as shown on Figures 7.2-5 through 7.2-9. The time concentration graphs are included in Appendix 7-3. In Appendix 7-3, the time/concentration graphs are divided by township and range from T29S/R24E, T29S/R25E, T29S/R26E, T30S/R24E, T30S/R25E, and T20S/R26E. Similarly combined graphs for alpha and uranium per well follow by township and range. The five chemical constituents are part of the group identified by the KFMC as COCs. The wells were selected based on availability of data and distribution of the wells both on KWB Lands and surrounding areas. Information from the time-concentration graphs supplements that shown on the “Areas of Groundwater Concern” map (Figure 7.2-4) above.

Time-concentration graphs were used to identify trends or changes in concentration over time that could be associated with groundwater migration. A trend might be identified if all COCs show a consistent pattern; that is, water level changes over time (hydrographs) and time-concentration graphs for the same well correlate.

The area of concern for TDS identified on Figure 7.2-3 and Figure 7.2-4 extends along the west side of KWB Lands adjacent to the Elk Hills. Figure 7.2-5 shows that elevated concentrations of TDS are widespread along the west side of the basin (and the west side of KWB Lands). A second area of elevated concentrations can be seen in Figure 7.2-6 and is located in the northeastern portion of KWB Lands. With the exception of well 30S/R25E-12B, all other wells in this area had stable concentrations of TDS near the MCL.

Figure 7.2-4 has identified a large area of elevated arsenic concentrations located south of KWB Lands and encroaching onto the southern portion of KWB Lands. Figure 7.2-8 shows wells with arsenic concentrations above the MCL. It can be seen that arsenic is widely distributed across the area but has no clear pattern other than it appears to be more widespread at and east of I-5 in the deepest parts of the aquifer system during times of recovery.

Time-series concentration graphs shown in Appendix 7-3, Figures 7.3-4A, B, C, and D, present arsenic concentrations from 1995 to 2014 for the shallow and deep zones. Arsenic is widely scattered throughout the area. There are few wells where the time-concentration graph either show an upward or downward trend.

In general, arsenic fluctuations are more pronounced with more MCL exceedances in deep zone wells. In particular, arsenic was considerably above the MCL in deep zone wells 30S/25E-36R01, 30S/26E-28J03, 30S/25E-22R03, and 30S/26E-32N03. These wells are all located in areas of concern for arsenic as identified on Figure 7.2-4.

Nitrate was below the MCL on KWB Lands and surrounding areas.

Figures 7.2-3 and 7.2-4 identified a large area southeast of KWB Lands with areas where uranium concentrations and a second smaller area on the western portion of KWB Lands and surrounding areas exceeding the MCL. Figure 7.2-9 identifies wells with uranium concentrations above the MCL. Alpha is related to uranium and a map identifying wells with alpha concentrations above the MCL is presented as Figure 7.2-8. It can be seen from Figures 7.2-8 and -9 that areas of elevated uranium and alpha extend across KWB Lands to areas to the northeast and east.

Uranium is generally widespread throughout the area with a few well locations on the west side of KWB Lands showing somewhat higher levels. For the most part, there are no trends in concentration. A few well locations showed a possible uptrend but these wells are mixed in with other wells with stable concentrations.

In most cases, hydrographs in the KWB area show relatively large water level fluctuations from 1995 through 2014, while COC concentrations remained relatively stable and did not correspond with the much larger changes in water level.

Particle Tracking

At the end of the three cycles of recharge and recovery, particle tracking for the APO shows that the “With KWB Operations” groundwater on the northern part of KWB Lands flows to the north and northwest, groundwater to the south flows southerly, and groundwater on the west side of KWB Lands flows northwest. The difference in distance a particle of water would have moved for the “With KWB Operations” compared to the “Without KWB Operations” can be seen on Figure 7.2-11. In general, particles move a somewhat greater distance for the “With KWB Operations” than for “Without KWB Operations.” The additional distance ranges up to about 1,500 feet.

Conclusion

Overall water quality within the various aquifer zones in the KWB is relatively unchanging. There are a few exceptions to this described above. Localized movement of COCs is limited laterally and in a few cases exhibits vertical mixing but overall trends are stable.

Therefore, changes in groundwater quality in the underlying aquifer as a result of lateral and vertical migration of poor quality from KWB operations from 1995 through 2014 were **less than significant**.

Mitigation Measures

None required.

2015 – 2035

Particle tracking analysis was performed for both the AFO-EC and AFO-BC for the “With” and “Without” KWB operations (Figures 7.2-12 and 7.2-13). There is a similar pattern of particle movement shown by the four graphs; the biggest difference between the “With” and “Without” KWB operations is that groundwater would migrate to the north and northwest as much as 1,500 feet in the “With” operations scenario. As recharge and recovery operations continue, groundwater migrates outward during times of recharge and inward during times of recovery. This would result in a mixing of groundwater in the KWB and surrounding area. Water used for recharge in KWB is from three surface water sources: SWP water in the California Aqueduct, Friant-Kern Canal water, and Kern River water. These surface water sources are of a higher quality than the existing groundwater present in KWB.

Similar responses to KWB operations are expected in the future and overall water quality within the various aquifer zones in the KWB changes would be similar as in the past.

Consequently, changes in groundwater quality in the underlying aquifer as a result of lateral and vertical migration of poor quality from KWB operations during 2015 through 2035 would be **less than significant**.

Mitigation Measures

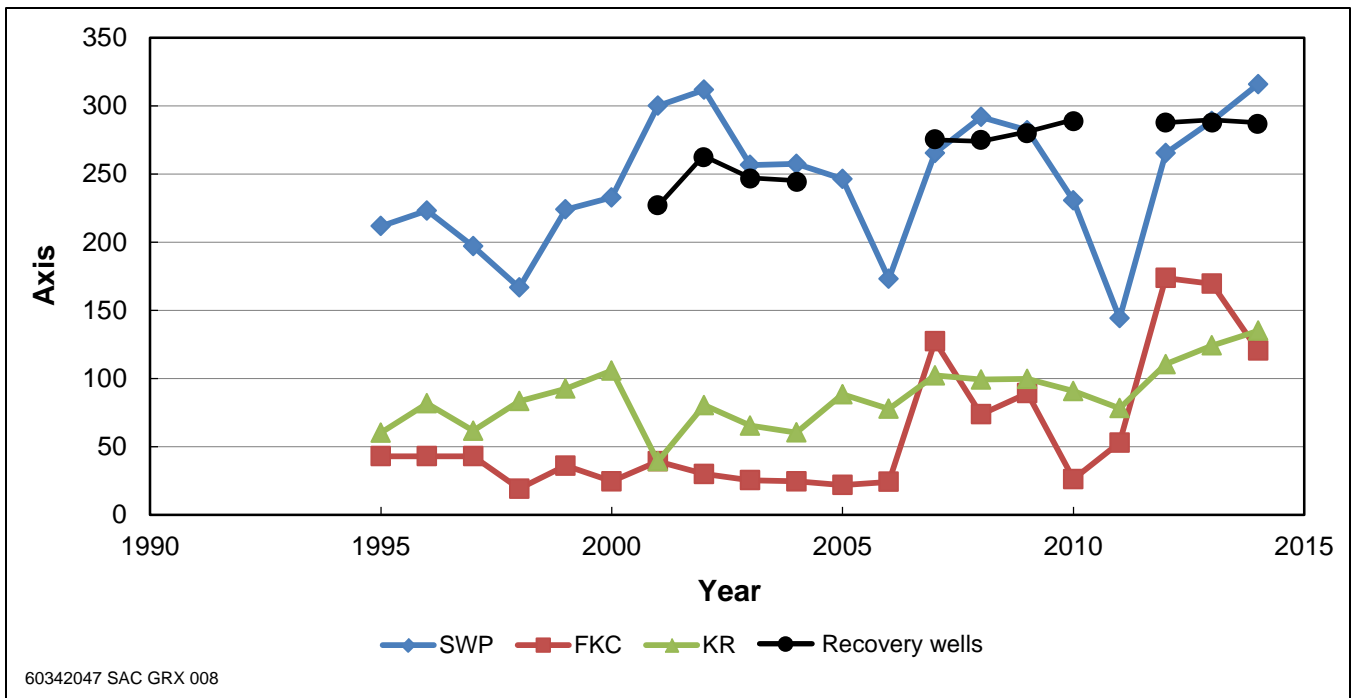
None required.

7.2-5 Kern Water Bank operations could potentially degrade water quality in the underlying aquifer as a result of an accumulation of salts during recharge activities.

1995 – 2014

TDS concentrations in imported and local water supplies used for KWB recharge operations can vary year to year and among sources. Water delivered to the KWB has TDS concentrations that vary by source (Figure 7.2-14). Concentration ranges from 144 to 314 mg/L with an average of 240 mg/L for SWP supplies; 12 to 174 mg/L with an average of 25 mg/L increasing to about 90 mg/L through 2014 for Friant-Kern Canal supplies; and 50 to 135 mg/L with an average of 80 mg/L for Kern River supplies.⁷ The variation in TDS concentrations in a given year is primarily a result of the amount of precipitation, and volumes of agricultural return flows, stormwater runoff, and municipal discharges. During recharge periods in above normal and wet water years, the average TDS concentrations tend to be lower because there is more water within the system that dilutes the effects of salt loading from various sources. Figure 7.2-14 also includes TDS values for blended groundwater recovered from the KWB. Average annual TDS concentrations range from 227 mg/L to 289 mg/L. This water is pumped into the California Aqueduct.

Table 7.2-10 summarizes TDS in KWB recharge water from 1995 to 2014. The total amount of salt in the recharge water varies annually from a low of 920 tons to a high of 114,000 tons. The variation is due to the amount of water recharged and the proportion of salts from the different water sources.



Source: AECOM 2016

Figure 7.2-14 TDS Concentrations in Recharge Water Sources and Recovery Groundwater, 1995-2014

Groundwater beneath the KWB has variable TDS concentrations with higher concentrations noted along the west and southwest portions of the bank. Therefore, TDS concentrations of water recovered depend on the location of the wells used during KWB recovery operations. Table 7.2-11 summarizes salt recovered during KWB recovery operations from 1995 to 2014.

Table 7.2-12 provides a salt balance from KWB recharge and recovery operations, and indicates that approximately 430,874 tons of salts were imported (added) with the recharge water and approximately 519,562 tons of salt were exported (removed) between 1995 and 2014. KWB recovery operations have removed 21% more salt than what was introduced during recharge operations (Table 7.2-12). Figure 7.2-15 shows the cumulative salt balance associated with KWB operations through 2014.

The 1995 KWB MOU includes water quality protection measures that assist with balancing salt concentrations within the hydrologic basin. These measures include giving recharge priority to the best quality water available; removing more salts than are recharged, at a minimum, by a percentage equal to or greater than the percentage of surface recharge losses (6%); controlling the migration of poor-quality water; and extracting poorer quality groundwater where practicable (and where blending with excellent quality water from elsewhere on KWB Lands results in the water quality objectives of downstream users being met).

Table 7.2-6 shows that California Aqueduct water upstream of the KWB (Check 21) is higher in TDS concentration than water below the KWB (Check 29). Check 29 is located downstream of KWB Canal on the California Aqueduct. The difference in upstream and downstream Aqueduct water quality is due in part to KWB operations. Water pumped into the California Aqueduct from KWB recovery and blending operations has a lower concentration of TDS than water present in the California Aqueduct, improving water quality in the California Aqueduct and to downstream users. This higher quality water is delivered both downstream in the basin and outside of the basin.

TABLE 7.2-10

**SUMMARY OF TOTAL DISSOLVED SOLIDS IN
KERN WATER BANK RECHARGE WATER SUPPLIES, 1995-2014**

Year	Gross Recharge (AF)	Net Recharge (AF)	Salt Added (tons)	Gross (mg/L)	Net (mg/L)	Net (tons/AF)
1995	222,260	208,924	28,092	93	99	0.13
1996	173,875	163,443	33,216	141	150	0.2
1997	112,262	105,526	20,582	135	144	0.2
1998	302,715	284,552	37,604	91	97	0.13
1999	36,753	34,548	9,270	186	197	0.27
2000	27,579	25,924	5,769	154	164	0.22
2001	10,030	9,428	3,817	280	298	0.4
2002	13,439	12,633	5,120	280	298	0.41
2003	40,374	37,952	17,895	326	347	0.47
2004	18,065	16,981	6,436	262	279	0.38
2005	387,557	364,304	114,436	217	231	0.31
2006	283,233	266,239	51,346	133	142	0.19
2007	16,728	15,724	7,675	338	359	0.49
2008	0	0	0	0	0	0
2009	0	0	0	0	0	0
2010	33,131	31,143	12,344	274	292	0.4
2011	476,501	447,911	76,352	118	125	0.17
2012	9,010	8,469	920	75	80	0.11
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
TOTAL	2,163,512	2,033,701	430,874	147*	156*	0.21

Notes:

AF= acre-feet; mg/L = milligrams per liter

No recharge occurred during 2008, 2009, 2013, and 2014

Net recharge volume in acre-feet is 6% less than gross recharge volume due to evaporative losses.

*The total gross and net in mg/L only represents the aggregate total not an average concentration of gross and net salt imported.

Source: Data from KCWA 2013⁴²; KWBA 2015X⁴³; KCWA 2015x1⁴⁴; KCWA 2015x2⁴⁵ compiled by AECOM in 2015

TABLE 7.2-11

**SUMMARY OF TOTAL DISSOLVED SOLIDS EXPORTED WITH
KERN WATER BANK RECOVERED WATER SUPPLIES, 1995-2014**

Year	Gross Recovery (AF) ¹	Salt Recovered (tons)	Gross Salt Exported (mg/L)	Net Salt Exported (mg/L)	Net (tons/AF)
1995	0	0	0	0	0
1996	0	0	0	0	0
1997	0	0	0	0	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	0	0	0	0	0
2001	88,695	27,403	227	170	0.31
2002	26,974	9,637	263	197	0.36
2003	45,122	15,155	247	185	0.34
2004	49,289	16,332	244	183	0.33
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	230,686	86,564	276	207	0.38

TABLE 7.2-11

**SUMMARY OF TOTAL DISSOLVED SOLIDS EXPORTED WITH
KERN WATER BANK RECOVERED WATER SUPPLIES, 1995-2014**

Year	Gross Recovery (AF) ¹	Salt Recovered (tons)	Gross Salt Exported (mg/L)	Net Salt Exported (mg/L)	Net (tons/AF)
2008	233,703	87,243	275	206	0.37
2009	162,461	62,311	282	212	0.38
2010	50,969	20,029	289	217	0.39
2011	0	0	0	0	0
2012	110,830	43,321	288	216	0.39
2013	197,171	77,270	288	216	0.39
2014	189,695	73,987	287	215	0.39
TOTAL	1,385,595	519,252	276*	207*	0.37

Notes:

AF= acre-feet; mg/L = milligrams per liter

No recovery occurred during 1995 – 2000, 2005, 2006, and 2011

Net salt exported from the hydrological basin is assumed to be 75% of salt extracted.

*The total gross and net does not represent an average from 2001 to 2014, but only the aggregate total of gross recovery and salt recovered.

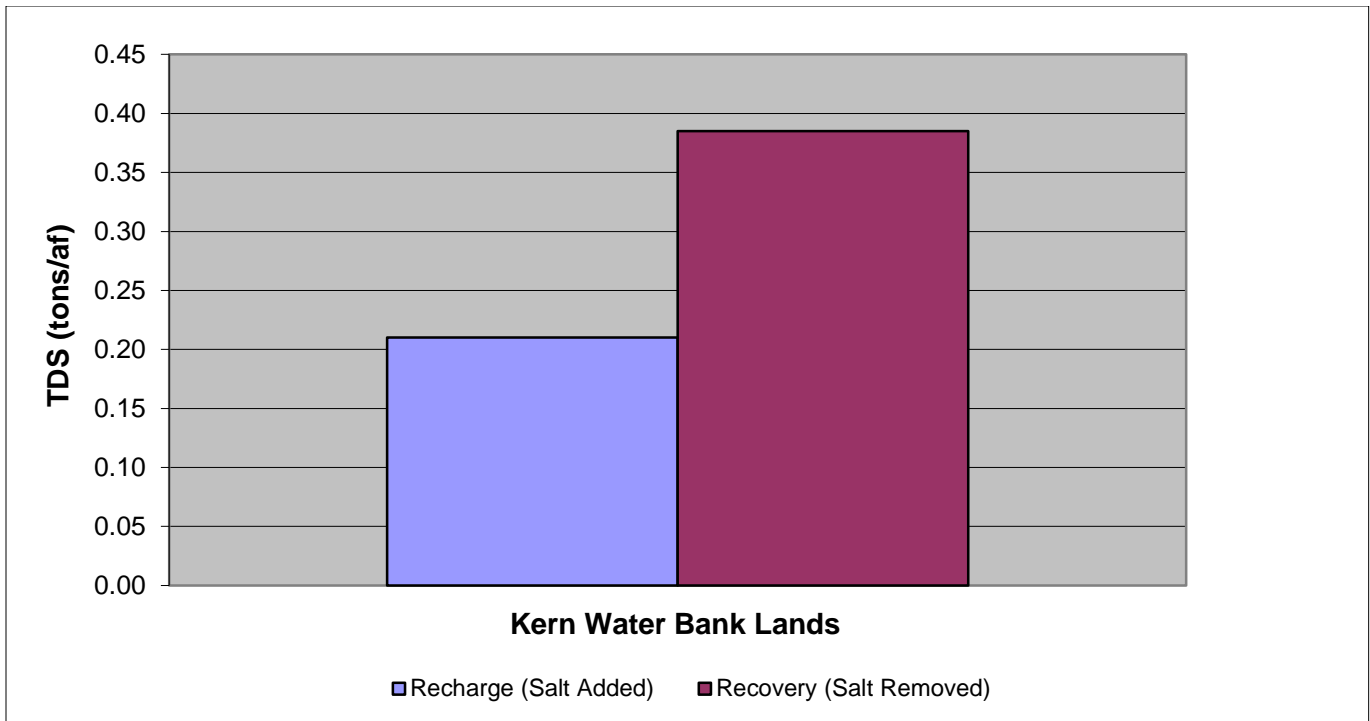
Source: Data from KCWA 2013⁴⁶; KWBA 2015X⁴⁷; KCWA 2015x1⁴⁸; KCWA 2015x2⁴⁹ compiled by AECOM in 2015

TABLE 7.2-12

ANNUAL SALT BALANCE ASSOCIATED WITH KERN WATER BANK OPERATIONS, 1995-2014

Year	Salt Added (see Table 7.2-10) (tons)	Salt Removed (see Table 7.2-11) (tons)	Net Salt Remaining (tons)
1995	28,092	0	28,092
1996	33,216	0	61,308
1997	20,582	0	81,890
1998	37,604	0	119,494
1999	9,270	0	128,764
2000	5,769	0	134,533
2001	3,817	27,403	110,947
2002	5,120	9,637	106,430
2003	17,895	15,155	109,170
2004	6,436	16,332	99,274
2005	114,436	0	213,710
2006	51,346	0	265,056
2007	7,675	86,564	186,167
2008	0	87,243	98,924
2009	0	62,311	36,612
2010	12,344	20,029	28,928
2011	76,352	0	105,280
2012	920	43,321	62,879
2013	0	77,270	-14,391
2014	0	73,987	-88,378
TOTAL	430,874	519,252	-88,378
Percentage of Net Salt Recovered during KWB Operations			21%

Source: Data from KCWA 2013⁵⁰; KWBA 2015⁵¹; KCWA 2015⁵²; KCWA 2015⁵³ compiled by AECOM in 2015



Source: AECOM 2016

FIGURE 7.2-15. Salt Balance Associated with KWB Operations, 1995-2014

Figure 7.2-15 shows that more salt is being removed from the aquifer below the KWB than is being recharged. The difference between the salt recharge and recovery volume in tons/acre foot indicate a lowering of salt content in the aquifer below KWB. This indicates that California Aqueduct water quality and groundwater quality beneath KWB have both been improved by operations of KWB with respect to TDS.

Therefore, impacts on water quality from accumulation of salts during KWB recharge activities from 1995 to 2014 were ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Similar responses to KWB operations are expected in the future and accumulation of salts during KWB recharge activities would be similar as in the past.

Therefore, impacts on water quality from accumulation of salts during KWB recharge activities from 2015 to 2035 would be ***less than significant***.

Mitigation Measures

None required.

7.2-6 KWB construction, development, and maintenance could potentially change water quality in the Kern River.

1996 – 2014

KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, a network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (>36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

Construction of these KWB facilities could have adversely affected surface water quality if spills or other pollutants were introduced into surface waters during rain events and runoff. Construction activities were conducted in compliance with regulatory requirements such as the NPDES General Construction Permit in effect at the time. Project-specific SWPPPs were developed and construction-related BMPs were implemented to minimize and avoid adverse effects from construction activities. Erosion control measures were implemented consistent with the KWB HCP/NCCP Vegetation Management Plan, which included seeding newly constructed berms and canal banks upon completion of final grade and broadcasting or straw-blowing clean straw or native grass hay over the newly seeded areas.

As discussed in Impact 7.11-1A in Section 7.11, Hazards and Hazardous Materials, construction contracts included specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels. Title 8 of the CCR also addressed the use of hazardous products in the work environment, which would apply to construction contractors. The potential for inadvertent spills of materials, which could affect nearby surface water bodies or groundwater, was managed through construction site BMPs. Construction of KWB facilities from 1996 through 2014 are not known to have caused any substantial adverse impacts on surface water quality.

Therefore, impacts to surface water quality in the Kern River from KWB activities during 1996 to 2014 were ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing IRWM program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with the KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

Construction of the ponds would require excavation, grading, and re-contouring of the soils at the recharge pond sites. During these activities, soils could become exposed to high winds or heavy precipitation causing a substantial increase in sedimentation in storm water run-off and loss of topsoil. In addition, construction activities would require the use of hazardous materials including but not limited

to petroleum products (i.e., oil, gasoline, and diesel fuels) and automotive fluids (i.e., antifreeze and hydraulic fluids). Inadvertent spills or leaks of such pollutants could affect the quality of runoff water from the construction sites. Construction activities would comply with the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit), as well as the KWB HCP/NCCP Vegetation Management Plan erosion control measures and applicable hazardous materials management laws and regulations. KWBA or its contractors would be required to prepare and submit a SWPPP that would identify pollutant sources that may affect the quality of storm water discharge and identify BMPs, such as erosion control and pollution prevention measures, to be used during construction. The project SWPPP would include BMPs to minimize the impacts of construction activities to water quality. With development of the SWPPP and implementation of BMPs, the potential for the discharge of pollutants and sediment to affect the water quality of runoff from construction sites would be minimized.

Construction activities may require discharges with a low threat to water quality or are low volume discharges with minimal pollutant concentrations. These discharges may be discharged to land under the Statewide “General Waste Discharge Requirements for Discharges to Land with Low Threat to Water Quality,” Order No. 2003 003 DWQ or discharged to surface waters under the CVRWQCB’s General Permit Order No. R5 2008 081, “Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters”.⁵⁴ These permits specify discharge duration and volume limitations, set forth effluent limitations, require compliance with water quality objectives listed in the Tulare Lake Basin Plan, and establish specific requirements for a monitoring and reporting program. In accordance with the requirements of either of these permits, KWBA would be required to implement control measures to meet water quality standards specified for discharged water, conduct the appropriate sampling to demonstrate permit compliance, and regulate flow rates to prevent erosion or downstream flooding in the receiving water.

During construction and maintenance activities spills of equipment fuel, lubrication oil, and hydraulic oil could occur. Petroleum hydrocarbon products and other construction-related materials, as well as any hazardous materials, would be stored, handled, and used, although in relatively small quantities, during construction and maintenance. The potential release of hazardous materials to the environment as a result of construction or maintenance activities could also result in the degradation of water bodies, affecting water quality. Section 7.11, Hazards and Hazardous Materials, presents an analysis of the potential release of hazardous materials during construction and maintenance.

Compliance with applicable regulatory requirements, including those of the NPDES General Construction Permit, which requires preparation of a project-specific SWPPP and implementation of BMPs, the potential for pollutants and sediment to adversely affect the water quality of adjacent water bodies, such as the Kern River would be minimized.

Therefore, impacts to surface water quality in the Kern River from KWB activities during 2015 to 2035 could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.2-6 would reduce potential impacts to surface water quality in the Kern River from KWB activities to less than significant. Therefore, the impact of KWB activities from 2015 to 2035 with regard to surface water quality in the Kern River from KWB activities would be ***less than significant, with mitigation***.

7.2-6 KWBA will implement Mitigation Measures 7.2-1, 7.2-2, 7.2-3, 7.8-1(a) and (b), and 7.11-2.

7.2-7 Continued use and operations of the KWB could potentially adversely impact water quality in surface water conveyance facilities and associated water supplies for downstream users.

1996 – 2014

Table 7-4 in Section 7.1.2 shows Kern River diversions for the 17-year period were 474,100 acre-feet (AF). Significant diversions (> 1,000 AF) occur during wet or above average years (six diversions from 1996 to 2014). Diversion of this water from the Kern River during high flows would not change the quality of water, only reduce the flow.

Water produced from KWB recovery and blending operations are subject to compliance with the Pump-in Policies for the SWP, KWB Canal, and CVC. These policies are designed to protect downstream water users. Each pump-in plan is reviewed by downstream water users and a Facilitation Committee. To determine if KWB operations comply with the Pump-in Policies, a blending model has been developed. The model is used to estimate water quality for a given set of flows and extraction wells.

In addition to the blending model, water quality monitoring is conducted by DWR and participating agencies in the California Aqueduct, canals, and recovery wells to verify conditions in the field are reasonably represented by the model and that the receiving waters are meeting applicable water quality objectives.

Recharge activities would have improved underlying groundwater quality through blending of high quality surface water. Pump-in water quality requirements ensured that water introduced into the CVC and California Aqueduct met KCWA and Department requirements.

To evaluate potential for changes in water quality in the California Aqueduct as a result of KWB operations, monitoring data collected by DWR were summarized for three locations on the Aqueduct and then compared for years representative of recharge (typical wet years 2006 and 2011) and recovery (typical dry years 2008 and 2014). Water quality at Check 25 (Check 21 may also be used if Semitropic Water Storage District is not pumping in) represents upstream conditions prior to the influence of KWB operations. Water quality at Check 29 represents conditions partially affected by pump-in of water from the KWB. Water quality at Check 29 can also represent conditions in the Aqueduct downstream of KWB Lands (see Table 7.2-6). Review of monitoring program data indicate MCLs were met in the California Aqueduct at the selected monitoring locations. To indicate if the KWB operations were increasing COCs such that they exceeded the MCLs, a comparison of upstream (Check 21) and downstream (Check 41) water quality was performed. The monitoring data for years with high recharge (2006 and 2011) and with high recovery (2008 and 2014) were analyzed separately to indicate the effects of the different operations on water quality (Table 7.2-6).

During recovery years, concentrations of some constituents increased at downstream locations compared to upstream locations. For example, average and maximum arsenic and nitrate concentrations increased at Check 41. In addition, some parameter concentrations decreased at the downstream locations (e.g., bromide, chloride, and TDS), indicating a potential benefit from KWB operations on water quality in the California Aqueduct.

Therefore, the effects of KWB operations during 1996 to 2014 on water quality in the surface water conveyance facilities and associated water supplies for downstream users were ***less than significant***.

Mitigation Measures

None required.

2015 – 2035

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing IRWM program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out.

KWBA has also applied for a water right to divert unappropriated water from the Kern River, which is the estimated maximum quantity that KWBA can physically divert and recharge at the KWB in the wettest years (KWB Conservation and Storage Project). The quantity of water available for diversion to the KWB would depend on annual and seasonal hydrologic and climatologic conditions. Appropriation of water under this application would also supplement and permit water historically diverted from the Kern River to the KWB in above-normal or wet water years.

These future projects may result in additional water diverted, recharged, and recovered at KWB, although primarily during wetter years. Water diversions from the Kern River under future operations, however, would be similar in quantity and timing as current operations, although some additional water may be available in the wettest of years, when water quality is generally improved. As discussed above for 1995-2014, future diversions from the Kern River are not anticipated to reduce water quality in the Kern River downstream from the point of diversion.

During recovery operations, groundwater would be introduced into the CVC and the California Aqueduct and would be subject to the pump-in water quality requirements by KCWA and the Department. Recovered groundwater pumped into the CVC and California Aqueduct would be monitored. It is the intent to meet Pump-in Policy water quality objectives.

KWBA, with assistance from KFMC, would continue to monitor water quality at production wells and continue blending efforts to ensure that MCLs, pump-in criteria, and SWP water quality objectives (WQOs) are not exceeded.

Potential Impacts from future operations to water quality in the Kern River, California Aqueduct, and local conveyance systems would be similar to historical activities described above for 1996-2014, given the continuation of the current pump-in policies and water quality monitoring program.

Therefore, the effects of KWB operations during 2015 to 2035 on water quality in the surface water conveyance facilities and associated water supplies for downstream users local conveyance facilities and water supplies would be **less than significant**.

Mitigation Measures

None required.

ENDNOTES

1. Kern County Water Agency. No date. *1995 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
2. Kern County Water Agency. 2005 (April). *2001 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
3. Kern County Water Agency. 2007 (October). *1996–2000 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
4. Kern County Water Agency. 2009 (September). *2002–2004 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
5. Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
6. Kern County Water Agency. 2015 (April). *Kern County Water Agency Response to Information Request for Groundwater Quality Data—Available Data from 1984 to Present Compiled by Michelle Anderson*. Bakersfield, CA.
7. State Water Resources Control Board, 2015. Water Quality Chemicals and Parameters. Available: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/EDTlibrary.shtml. Last updated July 22, 2015. Accessed November 30, 2015.
8. California Department of Water Resources. No date. Online water quality database.
9. Kern County Water Agency. 2011 (November). *Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan*. Final Update. Prepared by Kennedy/Jenks Consultants. Oxnard, CA.
10. Central Valley Regional Water Quality Control Board. 2010. *2010 Update of California's 303(d) List of Impaired Water Bodies*. Available: http://www.swrcb.ca.gov/losangeles/water_issues/programs/303d_list.shtml. Accessed June 1, 2015.
11. California Department of Water Resources. 1987 (April). *Kern River Fan Element Kern Water Bank. Preliminary Technical Report*. Sacramento, CA.
12. California Department of Water Resources. 1990 (December). *Kern Water Bank First Stage Kern Fan Element Feasibility Report*. Sacramento, CA.
13. Kern County Water Agency and California Department of Water Resources. 1994 (February). *Kern Water Bank Monitoring Report. Semiannual Water Level and Water Quality Report, Spring 1991, 1992 & 1993*.
14. California Department of Water Resources. 1987 (April). *Kern River Fan Element Kern Water Bank. Preliminary Technical Report*. Sacramento, CA.
15. California Department of Water Resources. 1990 (December). *Kern Water Bank First Stage Kern Fan Element Feasibility Report*. Sacramento, CA.

16. Kern County Water Agency and California Department of Water Resources. 1994 (February). *Kern Water Bank Monitoring Report. Semiannual Water Level and Water Quality Report, Spring 1991, 1992 & 1993.*
17. California Department of Water Resources. 1987 (April). *Kern River Fan Element Kern Water Bank. Preliminary Technical Report.* Sacramento, CA.
18. California Department of Water Resources. 1990 (December). *Kern Water Bank First Stage Kern Fan Element Feasibility Report.* Sacramento, CA.
19. Kern County Water Agency and California Department of Water Resources. 1994 (February). *Kern Water Bank Monitoring Report. Semiannual Water Level and Water Quality Report, Spring 1991, 1992 & 1993.*
20. Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
21. Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
22. Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
23. Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report.* Bakersfield, CA.
24. Kern County Water Agency and California Department of Water Resources. 1994. *Kern Water Bank Monitoring Report, Semi-annual Water Level and Water Quality Report, Spring 1991, 1992 & 1993.*
25. Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
26. Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
27. Central Valley Regional Water Quality Control Board. 2010. *2010 Update of California's 303(d) List of Impaired Water Bodies.* Available: http://www.swrcb.ca.gov/losangeles/water_issues/programs/303d_list.shtml. Accessed June 1, 2015.
28. Kern Water Bank Authority. 1997. *Sampling Plan for Groundwater Monitoring for Kern Fan Monitoring Program.*
29. Kern Water Bank Authority. 2012. *Kern Water Bank Recovery Program Water Quality Monitoring Plan.*
30. California Department of Water Resources. 2014 (December). *Water Quality Assessment of Non-Project Turn-ins to the California Aqueduct, 2013. Technical Memorandum Report.* Sacramento, CA.
31. Central Valley Regional Water Quality Control Board. 2010. *2010 Update of California's 303(d) List of Impaired Water Bodies.* Available: http://www.swrcb.ca.gov/losangeles/water_issues/programs/303d_list.shtml. Accessed June 1, 2015.

32. Central Valley Regional Water Quality Control Board. 2004 (January). *Water Quality Control Plan for the Tulare Lake Basin*. Second Edition.
33. State Water Resources Control Board. 2009 (September 2). NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, 2009 0009 DWQ (Construction General Permit).
34. State Water Resources Control Board. 2003 (April). Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (General WDRs). Water Quality Order No. 2003 0003 DWQ 30.
35. Central Valley Regional Water Quality Control Board. 2008 (June 12). General Order No. R5-2008-081, NPDES No. CAG995001. Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters.
36. California Legislation. Sustainable Groundwater Management Act, and Related Statutory Provisions from SB 1168 (Pavley), AB 1739 (Dickinson), and SB 1319 (Pavley) as Chaptered. September 29, 2014. Available: http://opr.ca.gov/docs/2014_Sustainable_Groundwater_Management_Legislation_092914.pdf. Accessed May 27, 2015.
37. Kennedy/Jenks Consultants. 2011 (November). *Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan Final Update*. Prepared for Kern County Water Agency.
38. Kern County Planning Department. 2009 (September 22). *Kern County General Plan*. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009. Available: <http://pcd.kerndsa.com/planning/planning-documents/general-plans>. Accessed May 21, 2015.
39. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Bakersfield, CA.
40. Smith, S. A. 2015. Recent Innovations in Well Rehabilitation. Available: <http://www.groundwaterscience.com/resources/tech-article-library/94-recent-innovations-in-well-rehabilitation.html>.
41. Central Valley Water Quality Control Board Correspondence regarding Soil Remediation and Site Groundwater Monitoring Plan, Former Frank Uhler Fire Training Facility, February 23, 2012. Redding, CA.
42. Kern Water Bank Authority. 2015 (December). KWBA Response to Information Request Regarding Monthly Recharge Volumes by Source.
43. Kern County Water Agency. 2015 (April). Kern County Water Agency Response to Information Request for Groundwater Quality Data—Available Data from 1984 to Present Compiled by Michelle Anderson. Bakersfield, CA.
44. Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.

45. Kern Water Bank Authority. 2015 (December). KWBA Response to Information Request Regarding Monthly Recharge Volumes by Source.
46. Kern Water Bank Authority. 2015 (December). KWBA Response to Information Request Regarding Monthly Recharge Volumes by Source.
47. Kern County Water Agency. 2015 (April). Kern County Water Agency Response to Information Request for Groundwater Quality Data—Available Data from 1984 to Present Compiled by Michelle Anderson. Bakersfield, CA.
48. Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
49. Kern Water Bank Authority. 2015 (December). KWBA Response to Information Request Regarding Monthly Recharge Volumes by Source.
50. Kern County Water Agency. 2015 (July). Kern County Water Agency Response to Information Request for Kern River and Friant Kern Canal water quality data—Available Data from 2006 to 2014. Provided by Nick Gatti. Bakersfield, CA.
51. Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
52. Kern County Water Agency. 2015 (April). Kern County Water Agency Response to Information Request for Groundwater Quality Data—Available Data from 1984 to Present Compiled by Michelle Anderson. Bakersfield, CA.
53. Kern County Water Agency. 2015 (March). Kern County Water Agency Response to Information Request for Blending Operations Data—Available Data from 2001 to Present Compiled by Michelle Anderson. Bakersfield, CA.
54. Central Valley Regional Water Quality Control Board. 2008 (June 12). General Order No. R5-2008-081, NPDES No. CAG995001. Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters.

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7.3 FISHERIES RESOURCES (NEW)

7.3 FISHERIES RESOURCES (NEW)

7.3.1 INTRODUCTION

7.3.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- Transfer of property known as the “Kern Fan Element property” in Kern County;*
- Water supply management practices; and*
- Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property; therefore, the Monterey Plus EIR fully disclosed all impacts caused by the transfer of the KFE property. Consequently, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.3 identified potential impacts to fisheries resources as a result of the transfer of the Kern Fan Element. The Monterey Plus DEIR Section 7.3 identified potential impacts to fisheries resources as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.3 that discusses KWB activities. All other text in DEIR Section 7.3 remains unchanged. Impacts on surface water hydrology and surface water quality are described in Sections 7.1, Surface Water and Groundwater Hydrology, and 7.2, Surface Water and Groundwater Quality, respectively.

Table 7.3-1A identifies the potentially affected environmental resources from impacts of KWB activities on fisheries resources.

TABLE 7.3-1A

IMPACTS OF THE KERN WATER BANK ACTIVITIES ON FISHERIES RESOURCES

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element Lands and KWB Activities	Local flows, water quality, and fish habitat on or near KWB Lands	7.3-1, 7.3-5*
<p>* Monterey Plus EIR Impact 7.3-5 considered whether implementation of the proposed project's Water Supply Management Practices, including State Water Project deliveries to the KWB, could potentially affect special-status fish species in the Sacramento-San Joaquin Delta due to Delta export changes. The decision in <i>Rosedale et al. v DWR</i> and <i>CDWA et al. v DWR</i> found the mitigation for potential impacts to resources in the Delta to be adequate. The REIR did not find any new information that would change the discussion relative to KWB activities. Therefore, no changes have been made to Impact 7.3-5.</p>		

Comments received in response to the Notice of Preparation for the Monterey Plus DEIR pertinent to fisheries resources are available in Appendix B of the Monterey Plus DEIR. No comments dealt with KWB activities.

7.3.1.2 Analytical Method

This analysis included a review of the environmental setting, impacts, and mitigation measures related to fisheries resources, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

The following additional documents were reviewed to describe the environmental setting as it existed in 1995 for the fisheries resources on KWB Lands:

- *Final Environmental Impact Report: Artificial Recharge, Storage, and Overdraft Correction Program, Kern County, California* (December 1986)¹;
- *Kern Water Bank (KWB) First Stage Kern Fan Element Draft Supplemental Environmental Impact Report* (December 1990)²;
- Biological information collected for the 1995 Draft and Final Program EIR for the Implementation of the Monterey Agreement³; and
- *Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan Implementation Agreement*, prepared by KWBA (October 1997)(KWB HCP/NCCP, Appendix 7-7a).

The following documents were reviewed to describe the environmental setting as it existed in 2014:

- A California Natural Diversity Database (CNDDB) query⁴ and U.S. Fish and Wildlife Service (USFWS) official species list⁵ for the following 7.5-minute topographic quadrangle maps: Buttonwillow, Rio Bravo, Rosedale, Oildale, Gosford, Stevens, Tupman, East Elk Hills, Taft, Milllux, and Conner.
- The KWB HCP/NCCP Annual Compliance Reports and corresponding Management Plans from 1996 through 2013.⁶

7.3.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this REIR, impacts to fisheries resources would be considered significant if KWB activities would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;
- Substantially reduce the habitat of a fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community;
- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources; or
- Substantially reduce populations of fish species having economic or social value.

The following potential impacts were removed from further analysis because KWB activities would have little to no impacts: substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; conflict with any local policies or ordinances protecting biological resources; and substantially reduce populations of fish species having economic or social value.

KWB water sources include the Kern River, and the Friant-Kern Canal and other canals. The Kern River at the KWB is dry except for flood flows, offering limited and temporary fish habitat. The Friant-Kern Canal is concrete-lined and offers no natural fish habitat. As KWB Lands consist of canals, diversions, turnouts, and recharge ponds, the occurrence of suitable habitat for fish species is extremely limited. Fish populations are limited to mostly non-native species. The recharge ponds themselves also provide only temporary habitat. Therefore, the aforementioned impact mechanisms are not discussed further because KWB activities would have less-than-significant impacts on fish populations, their habitats, and their migrations. None of the species present have more than marginal economic or social value. KWB activities also do not conflict with any local policies or ordinances protecting biological resources, and must comply with the KWB HCP/NCCP, which serves to protect habitats and species. Fish species and populations are limited in waterways on KWB Lands and in the Kern River near KWB facilities.

7.3.1.4 Life Histories of Fish Species of Concern through 2014

The following paragraphs highlight the species of concern that live in waterways that may be affected by KWB activities.

Kern Brook Lamprey (*Lampetra hubbsi*)

This species is endemic to the east side of the San Joaquin Valley and is listed as a California species of high concern.⁷ Kern brook lamprey were first collected from the Friant-Kern Canal but have since been found in the lower Merced, Kaweah, Kings, and San Joaquin Rivers.⁸ The species is not known to occur in the Kern River and would be unable to maintain a self-sustaining population or survive long-term in the Kern River in the KWB area. They occur at a mean elevation of about 500 feet, with a range of 100-1,100 feet. Ammocoetes prefer shallow pools with low-flow velocities, a mixture of sand and mud substrates, and water temperatures below 77 degrees Fahrenheit (°F). Adults prefer riffles with gravel and rubble for spawning and cover.

Kern brook lamprey ammocoetes have been detected in siphons of the Friant-Kern Canal, a source of water for the KWB. Individuals that become entrained in agricultural canals apparently do not contribute to the survival of the species. Once entrained in these sink habitats, adults are unable to spawn because of a lack of spawning habitat and thus do not contribute at the population level.

Kern River Rainbow Trout (*Oncorhynchus mykiss gilberti*)

The Kern River rainbow trout is a subspecies of golden trout and is part of the redband-rainbow trout complex found in isolated areas of California and Oregon. This species is listed as a California species of critical concern⁹ and is native to the upper Kern River basin. Historically, it was found as far downstream as Keyesville, which is more than 50 river miles upstream of the KWB. The Kern River rainbow trout was believed to have disappeared through genetic introgression with other forms of rainbow trout. Genetic studies in the 1980s suggested that the subspecies still exists in isolated areas of its native range. Populations are currently restricted to reaches of the Kern River above Lake Isabella.¹⁰

7.3.1.5 Physical Setting in 1995

Permanent fish habitat is limited to canals on KWB Lands; recharge ponds and the Kern River near KWB facilities only provide temporary habitat during recharge and high flows, respectively.

7.3.1.6 Changes in Physical Setting between 1996 and 2014

Water is delivered to the KWB through a number of water conveyance canals and the Kern River. A small portion of the Kern River flows through the southwest corner of KWB Lands in a northeast to southwest direction. Fish species that occur within these systems could conceivably be entrained in the KWB. The primary systems delivering water to the KWB area include:

- Friant-Kern Canal
- Kern River
- River Canal
- Cross Valley Canal
- KWB Canal
- Alejandro Canal
- California Aqueduct

These systems deliver water to the KWB through a system of pumps, diversions, and turnouts. The KWB can be broadly divided into two sections. The northern section is located north of the Kern River

and the southern section is located south of the river. Recharge ponds in the northern section receive water from the Cross Valley Canal and KWB Canal. Approximately 8 miles east of the eastern boundary of the KWB, the Friant-Kern Canal delivers water to the Cross Valley Canal. The Cross Valley Canal and KWB Canal are directly connected to the California Aqueduct on the western boundary of the KWB; both of these canals receive water directly from the California Aqueduct. Recharge ponds in the southern section receive water from the River Canal and Alejandro Canal. The River Canal also receives water from the Friant-Kern Canal. Kern River flows are diverted to the KWB during high-flow events and all KWB recharge ponds receive water through surface water flows. The physical characteristics of the recharge ponds and the annual water cycles within the recharge ponds are not suitable for fish occupation. Fish entrained in the recharge ponds likely would expire quickly.

7.3.1.7 Regulatory Setting in 1995

State

State of California Species of Special Concern

CDFW maintains a list of species of special concern (SSC). SSC is an administrative designation and carries no formal legal status. The intent of designating SSC is to focus attention on animals at conservation risk, stimulate research on poorly known species, and achieve conservation and recovery of these animals before they meet California Endangered Species Act criteria for listing as threatened or endangered. CEQA Guidelines Section 15380 suggests that SSC should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

7.3.1.8 Changes in Regulatory Setting between 1996 and 2014

Local

Kern Water Bank Habitat Conservation Plan/Natural Communities Conservation Plan

USFWS and CDFG approved the KWB HCP/NCCP in 1997. The federal and State HCP and NCCP programs seek to make the permit application process more efficient, while still complying with current federal, State, and county laws that protect threatened or endangered species. The goal is to conserve plant and wildlife species by preserving their natural communities. The KWB HCP/NCCP serves as an HCP pursuant to Section 10(a)(1)(B) of the 1973 federal Endangered Species Act (FESA), as well as an NCCP under the California NCCP Act of 2001. It allows the incidental “take” of selected species in areas outside of preserve boundaries, while guaranteeing that natural communities capable of sustaining the covered species’ population needs are preserved in perpetuity.

The KWB HCP/NCCP planning area comprises the entire approximately 19,900-acre KWB Lands. The KWB HCP/NCCP allows for the incidental take of up to 161 rare, threatened, or endangered species with documented occurrences or potential habitat on KWB Lands that may be affected by KWB activities, or species that do not currently occur and for which habitat does not currently exist on KWB Lands, but for which habitat may be created in the future.

Under the HCP, KWBA has authorization to incidentally take (including harm or harass) 161 covered species that are listed or may be listed in the future under FESA. Fish species covered under the HCP incidental take permit include Kern brook lamprey and Kern River rainbow trout. Both species are currently listed as species of special concern under the California Endangered Species Act and are listed as Group 2 species under the HCP incidental take permit. Neither species has ever been detected in, adjacent to, or within 50 miles of KWB Lands. CDFW designates certain vertebrate

species as species of special concern because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as species of special concern is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability. Group 2 species are defined by the incidental take permit as those that do not currently occur and for which habitat does not currently exist in the project area, and are unlikely to be affected by the action during the life of the permit but for which potential habitat may be created. Since the development of the KWB, special-status fish species have not been detected on KWB Lands.

7.3.2 IMPACTS AND MITIGATION MEASURES

7.3-1 KWB operations could potentially entrain or harm fish species of special concern.

1996 – 2014

Since 1996, KWBA has been responsible for managing KWB Lands in accordance with an KWB HCP/NCCP approved by USFWS and CDFG in 1997 (see Appendix 7-7a). The KWB HCP/NCCP documents a plan to accomplish water conservation and environmental objectives, mitigating KWB-specific impacts to less than significant at a regional level. The primary water conservation objective is to store water in aquifers during times of surplus for later recovery during times of shortage. The primary environmental objective is to set aside large areas of KWB Lands for endangered, threatened, and other sensitive species and to implement a program to protect and enhance the habitat. Under the HCP incidental take permit, KWBA has authorization to incidentally take (including harm or harass) 161 covered species, two of which are fish species: Kern brook lamprey and Kern River rainbow trout (Appendix 7-7e, CDFG Take Authorization). Neither of these species were detected on or adjacent to the KWB area before or during 1996-2014. The KWB HCP/NCCP states that impacts from the KWB would be “negligible” and that the KWB activities would not remove or provide suitable habitat for these species.

KWB water sources include the Kern River and the Friant-Kern Canal. Kern brook lamprey have been detected in the Friant-Kern Canal and it is possible, although highly unlikely, for individuals of the species to be present in the canals directly delivering water to the KWB. However, the canals are considered sink habitat for the species. Breeding habitat does not exist in the canals; any entrained lampreys would not spawn and would die. Canal populations of lampreys are not viable contributors to the population as a whole or to the conservation of the species. The only known Kern River rainbow trout population and suitable habitat occurs far to the east at a much higher elevation than the KWB. The likelihood of this species being transported down the Kern River during flood flows down the Kern River and being entrained into the KWB was extremely poor. Trout would not have been able to survive in the Kern River or in water bodies on the KWB because of high summer water temperatures and lack of water.

For these reasons, it is unlikely that there were any impacts on Kern brook lamprey and Kern River rainbow trout from KWB activities.

Therefore, the impact of KWB activities from 1996 to 2014 on Kern brook lamprey and Kern River rainbow trout was ***less than significant***.

Mitigation Measures

None required.

2015 – 2030

KWB sources of water from the Friant-Kern Canal and Kern River would generally be similar to 1996-2014. Potential impacts would be similar to those described above for 1996-2014. KWB activities would continue to have the rare potential to cause entrainment of Kern brook lamprey and Kern River rainbow trout that reach the KWB by highly unlikely events, and they are covered by the HCP incidental take permit.

For these reasons, it is highly unlikely that there would be any impacts on Kern brook lamprey and Kern River rainbow trout from KWB activities.

Therefore, the impact of KWB activities from 2015 to 2030 on Kern brook lamprey and Kern River rainbow trout would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. California Department of Water Resources. 1986 (December). *Final Environmental Impact Report: Artificial Recharge, Storage, and Overdraft Correction Program, Kern County, California*. Sacramento, CA.
2. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element Draft Supplemental Environmental Impact Report*. Sacramento, CA.
3. Central Coast Water Authority. 1995 (May). *Draft Program Environmental Impact Report for the Implementation of the Monterey Agreement*. Prepared by Science Applications International Corporation, Santa Barbara, CA.
4. California Department of Fish and Wildlife. 2015. Results of electronic database search and GIS data for sensitive species occurrences for California in polygon format. Version 5. Biogeographic Data Branch. Available: <https://map.dfg.ca.gov/rarefind/view/RareFind.aspx>. Accessed May 13, 2015.
5. U.S. Fish and Wildlife Service. 2015 (May 13). *List of Threatened and Endangered Species that May Occur in Your Proposed Project Location, and/or May Be Affected by Your Proposed Project: Kern Water Bank*. Sacramento, CA.
6. Kern Water Bank Authority. 1996. *Kern County Water Agency-Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA.

Kern Water Bank Authority. 1998 (January 1). *Kern Water Bank Authority 1997 Annual Compliance Report*. Bakersfield, CA.

Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1998 Annual Compliance Report*. Bakersfield, CA.

Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2001 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2000 Annual Compliance Report and 2001–2002 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Compliance Report and 2003–2004 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Compliance Report and 2004–2005 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Compliance Report and 2004–2006 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Compliance Report and 2006–2007 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Compliance Report and Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA.

7. California Department of Fish and Wildlife. 2015. California Fish Species of Special Concern, 3rd Edition, *Kern Brook Lamprey*. Available: <https://www.wildlife.ca.gov/Conservation/Fishes/Special-Concern>.
8. Moyle, P. B. 2002. *Inland Fishes of California*. University of California Press, Berkeley, CA.
9. California Department of Fish and Wildlife. 2015. California Fish Species of Special Concern, 3rd Edition, *Kern River Rainbow Trout*. Available: <https://www.wildlife.ca.gov/Conservation/Fishes/Special-Concern>.
10. Moyle, P. B. 2002. *Inland Fishes of California*. University of California Press, Berkeley, CA.

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7.4 TERRESTRIAL BIOLOGICAL RESOURCES (REVISED)

7.4 TERRESTRIAL BIOLOGICAL RESOURCES (REVISED)

7.4.1 INTRODUCTION

7.4.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the "Kern Fan Element property" in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property; therefore, the Monterey Plus EIR fully disclosed all impacts caused by the transfer of the KFE property. Consequently, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.4 identified potential impacts to terrestrial biological resources as a result of the transfer of the Kern Fan Element. Text from DEIR Section 7.4 that discusses KWB activities is copied below and shows revisions to this section. All other text in DEIR Section 7.4 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.4-1A identifies the potentially affected environmental resources from impacts of KWB activities on terrestrial biological resources.

<p style="text-align: center;">TABLE 7.4-1A</p> <p style="text-align: center;">IMPACTS OF KWB ACTIVITIES PROPOSED PROJECT ELEMENTS ON TERRESTRIAL BIOLOGICAL RESOURCES</p>		
Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Terrestrial biological resources with changes in land use and management of Kern Fan Element Lands and construction of recharge ponds on KWB Lands the Kern Fan Element property	7.4-1, 7.4-3

One comment on the Monterey Plus DEIR NOP, in a letter from the Department of Food and Agriculture by Steve Shaffer (Director of the Office of Agricultural and Environmental Stewardship), recommended that the cumulative loss of agricultural land as a result of the Monterey Amendment and the Settlement Agreement be analyzed for the potential impacts to wildlife. Migratory birds and some special-status species have adapted to using agricultural land (due to the loss of natural habitat), and if such land is taken out of production, it may no longer be suitable for use.

There are no designated critical habitat areas or local ordinances protecting terrestrial biological resources that will be affected by KWB activities; ~~the proposed project~~; therefore, these issues will not be addressed in this section.

7.4.1.2 Analytical Method

The following documents were reviewed to describe the environmental setting as it existed in 1995:

- Final EIR for the Artificial Recharge, Storage and Overdraft Correction Program, Kern County, California (Kern Water Bank) (December 1986);¹
- Kern Water Bank (KWB) First Stage Kern Fan Element Draft Supplemental EIR (December 1990);²
- Biological information collected for the 1995 Draft and Final Program EIR for the Implementation of the Monterey Agreement;^{3,4}
- Initial Study and Addendum to Monterey Agreement EIR of the Kern Water Bank Authority Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (June 1997) (1997 Monterey IS and Addendum, see Appendix 7-6a); and
- Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP), prepared by KWBA (October 1997) (see Appendix 7-7a).

The following documents were reviewed to describe the environmental setting as it existed in 2014~~03~~:

- A California Natural Diversity Database (CNDDDB) query and U.S. Fish and Wildlife Service (USFWS) official species lists for the following 7.5-minute topographic quadrangle maps, including the Department facility and surrounding quads in an approximately 10-mile radius:
 - For the Kern Fan Element – Lokern, Buttonwillow, Rio Bravo, Rosedale, Stevens, Tupman, East Elk Hills, West Elk Hills, Fellows, Taft, Mouth of Kern, and Millux quads.
- The KWB HCP/NCCP, prepared by the Kern Water Bank Authority (KWBA) (October, 1997) (see Appendix 7-7a); and
- The KWBA HCP/NCCP ~~2004 Annual Compliance Reports~~ and ~~2005-2006 corresponding Management Plans 1996 through 2013~~.⁵ (May 2005).

For the purposes of this report, special-status terrestrial biological resources are defined as those species listed as either threatened or endangered under either the California or Federal ESAs, species identified by either the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game [CDFG]) or the USFWS as “species of concern” and plant species identified by CDFW in its California Rare Plant Ranks (CRPR) or the California Native Plant Society (CNPS) in their Lists 1A, 1B, or 2 (prior to 2010). Further explanation of these categories is included under the Regulatory Setting Section. In addition, ~~habitats~~ natural communities considered to be rare by ~~CDFW~~ are also considered special-status.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to terrestrial biological resources, to the extent they apply, presented in the 1997 Monterey IS and Addendum (see Appendix 7-6a).

7.4.1.3 Standards of Significance

For the purpose of this REIR, impacts to terrestrial biological resources are considered significant if the KWB activities proposed project would:

- Have a substantial adverse effect, either directly or through habitat modification, on any species identified as endangered, rare, or threatened, as listed in Title 14 of the California Code of Regulations (Section 670.2 or 670.5) or Title 50 of the Code of Federal Regulations (Sections 17.11 or 17.12);
- Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the USFWS or ~~California Department of Fish and Game (CDFWG)~~;
- Reduce the number or restrict the range of an endangered, rare, or threatened species;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural communities identified in local or regional plans, policies, regulations, or by USFWS or ~~CDFWG~~;
- Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act (including marshes or vernal pools) through direct removal, filling, hydrological interruption, or other direct means;
- Interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- Conflict with the provisions of an adopted HCP, Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.

7.4.2 ENVIRONMENTAL SETTING

7.4.2.1 Physical Setting in 1995

The approximately 19,900 acre Kern Fan Element property is located in Kern County, about 20 miles west of Bakersfield and 10 miles south of Buttonwillow. Interstate 5 and the Kern River both bisect the area. The Kern Fan Element property had historically been subject to periodic flooding from the Kern River, and is able to absorb water at an extremely high rate, retaining it in underground aquifers. The land was used for cattle grazing in the 1880s, and then crop production in the 1930s. It was also explored for gas and oil resulting in numerous wells and pipelines. The Department purchased the land in 1988 with the intention of creating a groundwater bank. In 1995, four special-status plants and eleven special-status animals were known to occur on the Kern Fan Element property (see Table 7.4-2A).

TABLE 7.4-2A

SPECIAL-STATUS SPECIES WITH KNOWN OCCURRENCES AND THE POTENTIAL TO BE IMPACTED BY THE PROPOSED PROJECT ON KERN FAN ELEMENT PROPERTY IN 1995

Species Name	Status ¹ Federal/State/CNPS		Habitat
	1995	201403	
Plants			
Hoover's woolly-star (eriastrum) <i>Eriastrum hooveri</i>	T/-/4	D/-/4	Alkali sinks, washes. Usually on silty to sandy soils.
Recurved larkspur <i>Delphinium recurvatum</i>	C2/-/1B	SC /-/1B	On alkaline soils
San Joaquin woollythreads <i>Monolopia (Lembertia) congdonii</i>	E/-/1B	E/-/1B	Alkaline or loamy plains, sandy soils
Slough thistle <i>Cirsium crassicaule</i>	C2/-/1B	SC /-/1B	Sloughs, riverbanks, and marshy areas
Reptiles			
Blunt-nosed leopard lizard ² <i>Gambelia sila</i>	E/E, FP	E/E, FP	Sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief
Birds			
Burrowing owl <i>Athene cunicularia</i>	C2/CSC	SC ,BCC/CS C	Subterranean nester, <u>dependant</u> upon burrowing mammals, Burrow sites typically in open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.
Cooper's hawk <i>Accipiter cooperii</i>	-/CSC	-/ CSC	Nests in riparian growths of deciduous trees, as in canyon bottoms of river floodplains, within open, interrupted or marginal woodland.
Loggerhead Shrike <i>Lanius ludovicianus</i>	C2/CSC	SC ,BCC/CS C	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. Typically nests in broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and wash.
Northern Harrier <i>Circus cyaneus</i>	-/CSC	-/CSC	Breeds in shrubby vegetation within marshes, or grasslands.
Swainson's hawk <i>Buteo swainsoni</i>	-/T	SC ,BCC/T	Breeds in stands with few trees in Juniper-sage flats, riparian areas and oak savannahs. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.
White-tailed (black shouldered) kite <i>Elanus leucurus</i>	-/*	SC ,MNBMG -/FP	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. General nesting habitat is rolling foothill/valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.
American badger <i>Taxidea taxus</i>	-/CSC	-/ SA-CSC (CSC in 2006)	Need friable soils and open, uncultivated ground in drier open stages of most shrub, forest, and herbaceous habitats.
San Joaquin (Nelson's) antelope squirrel <i>Ammospermophilus nelsoni</i>	C2/T	SC -/T	Western San Joaquin Valley on dry, sparsely vegetated loam soils. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	E/T	E/T	Needs loose-textured sandy soils for burrowing, and suitable prey base, in annual grasslands or grassy open stages with scattered shrubby vegetation.
Tipton kangaroo rat	E/E	E/E	Needs soft friable soils which escape seasonal flooding

TABLE 7.4-2A

SPECIAL-STATUS SPECIES WITH KNOWN OCCURRENCES AND THE POTENTIAL TO BE IMPACTED BY THE PROPOSED PROJECT ON KERN FAN ELEMENT PROPERTY IN 1995

Species Name	Status ¹ Federal/State/CNPS		Habitat
	1995	201403	
<i>Dipodomys nitratoides nitratoides</i>			within saltbrush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley

Notes:

¹Status explanation

Federal

E Listed as endangered under the Federal Endangered Species Act.

T Listed as threatened under the Federal Endangered Species Act.

C2 Category 2 Candidate for which information now in the possession of the USFWS indicated that proposing to list and endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules.

SC Federal Species of Concern. The USFWS decided to no longer maintain C2 and C3 lists, and species formerly categorized as such were informally termed "Species of Concern." The Sacramento Fish & Wildlife Office maintains a list of *Species of Concern*. These species receive no legal protection and the use of the term does not mean that they will eventually be proposed for listing. In 2006, the USFWS stopped maintaining a Federal Species of Concern list.

D Delisted – Delisted species are monitored for five years after being delisted.

BCC US Fish and Wildlife Service, Bird of Conservation Concern

MNBMC US Fish and Wildlife Service, Migratory Nongame Bird of Management Concern-

State

E Listed as endangered under the California Endangered Species Act.

T Listed as threatened under the California Endangered Species Act.

CSC California Special Concern Species – categorized as such because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

FP Fully Protected – Fully protected species may not be taken or possessed without a permit from the Fish and Game Commission.

* Taxa listed with an asterisk (*) fall into one or more of the following categories – (1) Taxa that are biologically rare, very restricted in distribution, or declining throughout their range; (2) population(s) in California that are peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California; and (3) taxa closely associated with a habitat that is declining in California (e.g. wetlands, riparian, old growth forest).

SA Taxa found on the July 2003 Special Animals List, which have no legal or protection status.-No listing.

Other – California Native Plant Society

1B Rare, threatened or endangered in California and elsewhere

4 Plants of limited distribution.

²Relocated population with no known present occurrence.

Sources:

USFWS List of Candidate Fauna from California and Nevada as of 31 August 1994 (59 FR 58982).

Endangered and Threatened Wildlife and Plants 50 CFR 17.11 and 17.12, August 20, 1994.

State and Federal Endangered Animals for California and Listing Dates, Department of Fish and Game, Revised January 1994.

California Department of Fish and Game Natural Diversity Data Base Special Animals, December 1992 (The 1994 version could not be located).

California Department of Fish and Game Natural Diversity Data Base, May, 2003.

Prior to the Department's purchase of the Kern Fan Element property, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities (valley saltbush scrub, Great Valley mesquite scrub and valley sacaton grassland) and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. No wetland habitat was present in the project area, except for the canals used to convey agricultural water.

A Memorandum of Understanding was signed between the Department and KCWA on March 25, 1987, that provided for the phase out of all agricultural production on the KFE property by the end of 1993. In

fact, one of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter the agricultural lands were fallowed and introduced annual grasses and forbs colonized the KFE property. After the Department acquired the property, it continued to be farmed by tenants for several years. The Department gradually took the Kern Fan Element lands out of production and by 1995, approximately 16,000 acres of the Kern Fan Element consisted of fallow farmland that had been previously irrigated; 288 acres of actively irrigated farmland; and approximately 2,690 acres of native and disturbed vegetation, including open areas, and land maintained under dry farming for weed management. The remaining 490 acres consisted of roads, canals, and oil and gas facilities.⁶

7.4.2.2 Changes in Physical Setting between 1996 and 2014⁰³

~~Changes in the physical setting are described below.~~

The Kern Fan Element property was transferred to the Kern County Water Agency and then to the KWBA in 1995. The KWB activities are discussed in more detail in the impact analysis below. The USFWS and CDFG approved ~~an~~the KWB HCP/NCCP for the KWB Lands in October 1997 (Appendix 7-7a). ~~The~~s KWB HCP/NCCP is discussed in more detail in 7.4.2.3, Changes in Regulatory Setting between 1996 and 2014.

Under the KWB HCP/NCCP, KWBA has authorization to incidentally take (including harm or harass) 161 covered species that are listed or may be listed in the future under the federal Endangered Species Act (FESA)(Appendix 7-7e). These include the species that were known to occur on the site in 1995, which are listed in Table 7.4-2A below. Since the development of the KWB, which began in 1996, an additional 16 special-status plants and animals have recorded occurrences on ~~the~~ KWB Lands (Table 7.4-3A). Numerous other species, particularly waterfowl, have been documented on ~~the~~ KWB Lands. All but six of these species (Horn's milk-vetch, brown pelican, tundra swan, Lawrence's goldfinch, California thrasher, and yellow-headed blackbird) are covered under the KWB HCP/NCCP.

7.4.2.3 7.4.2.4 Regulatory Setting in 1995

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) prohibits "take" of federally-listed threatened or endangered wildlife species, without either a Section 7 or 10 permit. "Take" as defined, includes actions that involve harming, pursuing, possessing, or harassing individuals of a protected species, as well as "such acts as may include significant habitat modification or degradation" (50 CFR §17.3). For listed plants, the FESA does not strictly prohibit take but does require compliance with state and local regulations. Species identified as candidates for listing in either Category 1 or 2⁷ do not have the full protection of the FESA; however, USFWS advises project applicants that a Category 1 or 2 species could be elevated to listed status at any time.

Under the FESA, the Secretary of the Interior and the Secretary of Commerce, jointly have the authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether the project would have a potentially significant impact on any federally-listed threatened or endangered species, on any species proposed to be listed under FESA, or would result in the destruction or adverse modification of critical habitat (16 USC 1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation.

TABLE 7.4-3A

**ADDITIONAL SPECIAL-STATUS PLANTS AND ANIMALS RECORDED ON
KERN WATER BANK LANDS SINCE 1995**

Species	Status ¹
Plants	
Horn's milk-vetch <i>Astragalus hornii</i> var. <i>hornii</i>	-/-1B
Amphibians	
Western spadefoot <i>Scaphiopus hammondii</i>	-/CSC
Reptiles	
Western pond turtle <i>Emys marmorata</i>	-/CSC
California horned lizard <i>Phrynosoma coronatum frontale</i>	-/CSC
Birds	
Brown pelican <i>Pelecanus occidentalis</i>	D/FP
Lawrence's goldfinch <i>Carduelis lawrencei</i>	BCC/-
Black tern <i>Chlidonias niger</i>	-/CSC
Tricolored blackbird <i>Agelaius tricolor</i>	BCC/C
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	-/CSC
Mammals	
Buena Vista Lake shrew <i>Sorex ornatus relictus</i>	E/CSC
Tulare grasshopper mouse <i>Onychomys torridus tularensis</i>	-/CSC
Note: 1. Federal Status/State Status/California Native Plant Society Designation Federal: E = Listed as endangered under the Federal Endangered Species Act (FESA); T = Listed as threatened under the FESA; D = Delisted; BCC = Bird of Conservation Concern; - = No listing State: E = Listed as endangered under the California Endangered Species Act (CESA); T = Listed as threatened under CESA); C = Candidate for listing under CESA; CSC = California Special Concern Species; FP = Fully protected species may not be taken or possessed without a permit from the Fish and Game Commission; - = No listing. California Native Plant Society Rare Plant Rank: 1B = Rare, threatened or endangered in California and elsewhere Source: Compiled by AECOM 2015. Based on KWB HCP/NCCP annual reports.	

Projects that would result in “take” of any federally-listed threatened or endangered species are required to obtain authorization from the USFWS through either Section 7 (interagency consultation) or Section 10(a) (incidental take permit) of FESA, depending on whether the federal government is involved in permitting or funding the project. The Section 7 authorization process is used to determine if a project with a federal nexus would jeopardize the continued existence of a listed species and what mitigation measures would be required to avoid jeopardizing the species. The Section 10(a) process allows take of endangered species or their habitat in non-federal activities.

Federal Regulation of Activities in Wetlands

The regulations and policies of various federal agencies (e.g., the United States Army Corps of Engineers [Corps], United States Environmental Protection Agency [EPA], USFWS, and the National Marine Fisheries Service [NMFS]) mandate that the filling or excavating of wetlands be avoided unless

it can be demonstrated that no practicable alternatives exist. The Corps has primary federal responsibility for administering permits to fill jurisdictional waters of the U.S. under the Rivers and Harbors Act (Sections 9 and 10), Section 404 of the Clean Water Act and a Memorandum of Understanding with the EPA. Most waters of the U.S. are defined by list (e.g., lakes, ponds, rivers) but also include navigable waterways, their tributaries (including intermittent streams), and wetlands. The EPA, USFWS, NMFS, and several other agencies provide comment on Corps permit applications. The EPA has provided the primary criteria for evaluating the biological impacts of Corps permit actions in wetlands.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

State

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFWG has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code 2050 *et seq.*). Listed wildlife species may not be “taken” without adequate mitigation and compensation. Under 1995 conditions, “take” meant to hunt, pursue, catch, capture, or kill or attempt to do so; it did not prohibit indirect harm by way of habitat modification. Listed plants could not be taken unless advance notice and request to salvage were given to CDFWG. Typically, CDFWG implemented endangered species protection by entering into management agreements (Section 2081 management agreements) with project proponents.

CDFWG also maintains a list of “species of special concern”, which are species that the CDFWG has considered to be indicators of regional habitat changes, or are considered to be potential future protected species. Species of special concern do not have any special legal status, but CDFWG affords these species special consideration when evaluating proposed projects.

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA section 15380 provides that a species not listed on the federal or state lists of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. Guidelines issued by the Director of CDFWG state that CNPS List 1B plants fulfill these criteria and therefore should be included in environmental impact reports and mitigation. CDFWG guidelines do not carry the obligations of law or regulation, but CDFWG views this policy as a means to avoid project delays in addressing species issues of which the applicant was not formerly notified. Thus, CEQA provides an agency with the ability to protect a species from a project’s potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

Fish and Game Code - Sections 3503, 3503.5, 3513

Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as

designated in the Migratory Bird Treaty Act. These regulations could require that elements of KWB activities ~~the proposed Project~~ (particularly vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFWG and/or USFWS.

CDFWG Streambed Alteration Agreement

Sections 1600-1607 of the California Fish and Game Code prohibit alterations of any streams, including intermittent and seasonal channels and many artificial channels without a permit from CDFWG. The limit of CDFWG jurisdiction is (subject to the judgment the Department), up to the 100-year flood level.

California Native Plant Society (CNPS)

Vascular plants listed as rare or endangered by the CNPS (Skinner and Pavlik, 1995),⁸ but which have no designated status or protection under federal or state-endangered species legislation, are defined as follows:

- List 1A Plants Believed Extinct.
- List 1B Plants Rare, Threatened, or Endangered in California and elsewhere.
- List 2 Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere.
- List 3 Plants About Which More Information is Needed – A Review List.
- List 4 Plants of Limited Distribution – A Watch List.

In general, plants appearing on CNPS List 1 are considered to meet CEQA section 15380 criteria.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) requires that each of the state's nine regional water quality control boards (RWQCBs) prepare and periodically update basin plans for water quality control. Each basin plan sets forth water quality standards for surface water and groundwater and actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to protect wetlands through the establishment of water quality objectives. The jurisdiction of RWQCBs includes federally protected waters as well as areas that meet the definition of "waters of the state." "Waters of the state" is defined as any surface water or groundwater, including saline waters, within the state's boundaries. RWQCBs have the discretion to take jurisdiction over areas not federally regulated under Section 401, provided they meet the definition of waters of the state. Typically, RWQCBs require mitigation requiring no net loss of wetlands functions and values of waters of the state. If KWB Lands support aquatic features that that do not qualify for federal regulation under Section 401 of the CWA, such features may be subject to protection as waters of the state under the Porter-Cologne Water Quality Control Act.

7.4.2.4 Changes in Regulatory Setting between 1996 and 201403

Federal

Federal Endangered Species Act

No change to the FESA occurred between 19965 and 201403, though the definition of "take" has been further refined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt

to engage in such conduct”, where “harm” includes significant habitat modification or degradation that actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR 17.3). Project-related impacts to listed threatened or endangered species, species proposed for listing or their habitats are still considered significant and would require mitigation. The USFWS no longer tracks candidate species, though in 2003, these remained on the CDFWG Special Animals list as “federal species of concern” and are considered rare under CEQA section 15380. As of May 2006, the USFWS no longer maintains the “federal species of concern” lists although many of these species remain on the CDFWG Special Animals list. Table 7.4-53 lists each species whose status has changed since 1995 and explains the change. Information on species known to occur in the region, but not impacted by KWB activities~~the proposed project~~, can be found in DEIR Appendix J (Document B, Volume II). Known occurrences of special-status species and plants for KWB Lands are listed in Table 7.4-2A and Table 7.4-3B.

Federal Regulation of Activities in Wetlands

No changes to regulation of activities in wetlands have occurred between 1996~~5~~ and 2003-2014 in a way which would change the regulatory requirements of the ~~proposed project~~ KWB activities. However, in 2008, the Corps and EPA issued regulations governing compensatory mitigation for activities authorized by permits issued by the Corps (33 CFR 332). The regulations establish a preference for using mitigation banks. Mitigation banks provide established wetland habitats that have already met success criteria, thereby reducing some risks and uncertainties of compensatory mitigation involving creation of new wetlands that cannot yet demonstrate functionality at project implementation. The regulations also establish a preference for providing compensatory mitigation within the affected watershed. Ideally, compensatory mitigation would take place at a mitigation bank in the same watershed as the waters to be replaced. If mitigation banks are not available in the affected watershed, then compensatory mitigation involving creation or restoration in the affected watershed may be preferable to using a mitigation bank outside the affected watershed.

Migratory Bird Treaty Act

No changes to the Migratory Bird Treaty Act have occurred between 1996~~5~~ and 2003-2014 in a way that would change the regulatory requirements of the ~~proposed project~~ KWB activities.

State

California Endangered Species Act (CESA)

No change to the CESA has occurred between 1996~~5~~ and 2003-2014 in a way that would change the regulatory requirements of the ~~proposed project~~ KWB activities. CDFWG continues to maintain a list of candidate, threatened and endangered species, as well as species of concern. Table 7.4-3B lists each species whose status has changed since 1995 and identifies the change. Project-related impacts on state endangered or threatened species and species of concern are considered significant under CEQA Guidelines Section 15380, and would require mitigation.

Changes to the state Fish and Game code occurred that limited the duration of the consultation process required under Sections 2090-2096. Regardless of this change, CDFWG still consults with applicants whose projects could impact state-listed species.

TABLE 7.4-3B
SPECIAL-STATUS UPDATES FOR PLANT AND WILDLIFE SPECIES
KNOWN TO OCCUR ON KWB LANDS

Common Name	Scientific Name	1994 Status (Federal/State/CNPS) ¹	2014 Status (Federal/State/CRPR) ¹
Hoover's woolly-star (eriastrum)	<i>Eriastrum hooveri</i>	T/--/CNPS 4	D/--/CNPS 4
Recurved larkspur	<i>Delphinium recurvatum</i>	C2/--/CNPS 1B	/--/CNPS 1B
San Joaquin woollythreads	<i>Monolopia (Lembertia) congdonii</i>	E/--/CNPS 1B	E/--/CNPS 1B
Slough thistle	<i>Cirsium crassicaule</i>	C2/--/CNPS 1B	/--/CNPS 1B
Western spadefoot	<i>Scaphiopus hammondi</i>	C2/CSC	SC/CSC
Blunt-nosed leopard lizard ²	<i>Gambelia sila</i>	E/E, FP	E/E, FP
Western pond turtle	<i>Clemmys marmorata</i>	C2/CSC	SC/CSC
Burrowing owl	<i>Athene cunicularia</i>	C2/CSC	BCC/CSC
California thrasher	<i>Toxostoma redivivum</i>	-/-	-/-
Cooper's hawk	<i>Accipiter cooperii</i>	-/CSC	-/-
Lawrence's goldfinch	<i>Carduelis lawrencei</i>	-/-	SC, BCC/-
Loggerhead shrike	<i>Lanius ludovicianus</i>	C2/CSC	BCC/CSC
Northern Harrier	<i>Circus cyaneus</i>	-/CSC	-/CSC
Swainson's hawk	<i>Buteo swainsoni</i>	-/T	BCC/T
White-tailed (black-shouldered) kite	<i>Elanus leucurus</i>	-/*	-/FP
American badger	<i>Taxidea taxus</i>	-/CSC	-/CSC
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	C1/CSC	E/CSC
San Joaquin (Nelson's) antelope squirrel	<i>Ammospermophilus nelsoni</i>	C2/T	-/T
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E/T	E/T
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	E/E	E/E

Notes:

1. Federal Status/State Status/California Native Plant Society Designation as described below

Federal:

- E Listed as endangered under the Federal Endangered Species Act.
T Listed as threatened under the Federal Endangered Species Act.
C2 Category 2 Candidate for which information now in the possession of the USFWS indicated that proposing to list and endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules.
SC Federal Species of Concern. The USFWS decided to no longer maintain C2 and C3 lists, and species formerly categorized as such were informally termed "Species of Concern." The Sacramento Fish & Wildlife Office maintains a list of *Species of Concern*. These species receive no legal protection and the use of the term does not mean that they will eventually be proposed for listing.
D Delisted – Delisted species are monitored for five years after being delisted.
BCC US Fish and Wildlife Service, Bird of Conservation Concern.
MNBMC US Fish and Wildlife Service, Migratory Nongame Bird of Management Concern.
- No listing.

State:

- E Listed as endangered under the California Endangered Species Act.
T Listed as threatened under the California Endangered Species Act.
CSC California Special Concern Species – categorized as such because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
* Taxa listed with an asterisk (*) fall into one or more of the following categories – (1) Taxa that are biologically rare, very restricted in distribution, or declining throughout their range; (2) population(s) in California that are peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California; and (3) taxa closely associated with a habitat that is declining in California (e.g. wetlands, riparian, old growth forest).
SA Taxa found on the July 2003 Special Animals List, which have no legal or protection status.
- No listing.

Other:

- CNPS/CRPR 1B – Plants that are rare, threatened or endangered in the state of California.
CNPS/CRPR 4 – Plants of Limited Distribution – A Watch List.

2. Relocated population with no known present occurrence.

Sources:

USFWS List of Candidate Fauna from California and Nevada as of 31 August 1994 (59 FR 58982).

TABLE 7.4-3B

**SPECIAL-STATUS UPDATES FOR PLANT AND WILDLIFE SPECIES
KNOWN TO OCCUR ON KWB LANDS**

Common Name	Scientific Name	1994 Status (Federal/State/CNPS) ¹	2014 Status (Federal/State/CRPR) ¹
<p>Endangered and Threatened Wildlife and Plants 50 CFR 17.11 and 17.12, August 20, 1994. State and Federal Endangered Animals for California and Listing Dates, Department of Fish and Game, Revised January 1994. California Department of Fish and Game Natural Diversity Data Base Special Animals, December 1992 (The 1994 version could not be located). California Department of Fish and Game Natural Diversity Data Base, May, 2003.</p>			

CEQA Guidelines Section 15380

~~No change to CEQA Guidelines Section 15380, subsection (d) was amended in 2005, has occurred between 1995 and 2003.~~

CDFW Lake or Streambed Alteration Agreement

Since 1995, the California Fish and Game Code that addresses the CDFW Lake or Streambed Alteration Agreements has been changed to include modifications to lakes. As a result of a 1999 Mendocino County court ruling, CDFW is required to meet CEQA requirements prior to issuing a lake or streambed alteration agreement. In addition, the Code was replaced in January 2004 with the new Sections 1600-1616, which lays out the timelines differently, extends the duration of agreements to five years with an option for longer terms, and raises the maximum fee that can be collected from \$2,400 to \$5,000.

Fish and Game Code – Sections 3503, 3503.5, 3513

~~No change to Fish and Game Code Sections 3503, 3503.5, 3513 has occurred between 1996 and 2003.~~

Fish and Game Code—Sections 3511, 4700, 5050, and 5515

Four sections of the California Fish and Game Code—Sections 3511, 4700, 5050, and 5515—list 37 fully protected species. These statutes prohibit take or any possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. An exception is provided where, at the time of plan approval, CDFW may authorize by permit the taking of any covered species, including species designated as fully protected species pursuant to Sections 3511, 4700, 5050, or 5515, whose conservation and management is provided for in a NCCP approved by CDFW pursuant to Section 2835. CDFW has informed nonfederal agencies and private parties that they must avoid take of any fully protected species in carrying out projects. Activities associated with a project that could result in impacts on fully protected species that are not covered by a permit authorized pursuant to Section 2835 would be subject to the California Fish and Game Code take prohibition.

California Native Plant Society (CNPS)

No change to the CNPS has occurred between 1996 and 2014 in a way that would change the regulatory requirements for species known to occur on KWB Lands. However, in 2010, CDFW changed the name of the CNPS List to the California Rare Plant Rank (CRPR) in an effort to clarify that these plant rank assignments are made collaboratively in a process managed jointly by CDFW and CNPS and are not solely the work of CNPS. Together, CNPS and CDFW with a group of over 300 botanical

experts from government, academia, non-governmental organizations, and the private sector assign plants to the CRPR system in an effort to categorize degrees of concern. The more recent online inventory was released in December 2010.

Vascular plants listed as rare or endangered, but which have no designated status or protection under federal or state-endangered species legislation, are defined as follows:

- List 1A Plants Presumed Extirpated in California and either Rare or Extinct Elsewhere
- List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
- List 2A Plants Presumed Extirpated in California but Common Elsewhere
- List 2B Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere
- List 3 Plants About Which More Information is Needed—A Review List
- List 4 Plants of Limited Distribution—A Watch List

California Native Plant Protection Act

The California Fish and Game Commission can designate plants as rare or endangered. As under federal law, listed plants have considerably less protection than fish and wildlife under state law. The California Native Plant Protection Act (California Fish and Game Code Section 19000 et seq.) allows landowners to take listed plant species from, among other places, a canal, lateral ditch, building site, or road, or other right-of-way, provided that the owner first notifies CDFW and gives the agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed.

Other Statutes, Codes, and Policies Affording Limited Species Protection

~~The sixth edition of CNPS's Inventory of Rare and Endangered Plants of California was published in August 2001. This edition included non-vascular plants (including mosses and liverworts) and more than 300 newly-described plants. While a plant's status may have changed between 1995 and 2003 due to new information, CNPS List 1 or 2 are now considered to meet CEQA section 15380 criteria and effects on these species are considered significant in this EIR. Table 7.4-3 lists each species whose status has changed since 1995 and explains the change. Information on species known to occur in the region, but not impacted by the proposed project can be found in Appendix J.~~

Kern Water Bank (KWB) Habitat Conservation Plan/Natural Communities Conservation Plan (KWB HCP/NCCP)

The USFWS and CDFG approved the KWB HCP/NCCP in October 1997 (Appendix 7-7a). The federal and state HCP and NCCP programs seek to make the permit application process more efficient, while still complying with current federal, state and county laws that protect threatened or endangered species. The goal is to conserve plant and wildlife species by preserving their natural communities. The KWB HCP/NCCP serves as an HCP pursuant to Section 10(a)(1)(B) of the 1973 FESA, as well as a Natural Communities Conservation Plan (NCCP) under the California NCCP Act of 2001. It allows the incidental "take" of selected species in areas outside of preserve boundaries, while guaranteeing that natural communities

The KWB HCP/NCCP documents a plan to accomplish both water conservation and environmental objectives by:

1. Allowing the development of water recharge and recovery facilities;
2. Preserving compatible upland habitat and other sensitive areas of natural habitat and rare plants;
3. Conserving species listed as threatened or endangered, pursuant to federal and state environmental laws (listed species as well as other sensitive species);
4. Re-creating intermittent wetland¹/rangeland habitat;
5. Providing a conservation bank for third parties; and
6. Permitting farming.

The KWB HCP/NCCP planning area comprises the entire approximately 19,900-acre KWB Lands Kern Fan Element property. A breakdown of permitted land uses is shown in Table 7.4-4. The KWB HCP/NCCP (Appendix 7-7a and 7-7e) allows for the incidental take of up to 161 rare, threatened or endangered species with documented occurrences or potential habitat in the project area that may be affected by KWB activities ~~the proposed project~~, or species that do not currently occur and for which habitat does not currently exist in the project area, but for which habitat may be created in the future.

Land Uses on the Kern Water Bank Lands	Area in Acres ¹
Recharge Ponds	5,900 ²
Other Banking Facilities	481
Compatible Habitat	5,592 ²
Sensitive Habitat	960
Department Mitigation Land	530
Farming	3,170
Conservation Bank ³	3,267
Total	19,900

Notes:

1. Administrative modification will allow for a shift of up to 559 acres of Compatible Habitat and 95 acres of Sensitive Habitat acres to Recharge Ponds or Other Water Banking Facilities as described in Section V.D. of the habitat conservation plan.
2. Kern Water Bank Authority Mitigation Land—146 acres of Recharge Ponds and 489 acres of Compatible Habitat totaling 635 acres will be covered by a conservation easement.
3. Included potential commercial development zone of up to 490 acres, which was ~~precluded~~ ~~rescinded~~ by the Settlement Agreement. ~~Monterey Agreement.~~

Source: Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, 1997 (see Appendix 7-7a).

7.4.3 IMPACTS AND MITIGATION MEASURES

7.4-3 Implementation of the KWB activities ~~proposed project~~ could potentially affect special-status terrestrial biological resources on the ~~Kern Fan Element property~~ KWB Lands due to changes in land use and management.

¹ Periodic recharge operations result in the intermittent wetting and drying of recharge ponds. This mimics the cyclic pattern of intermittent wetlands that dominated this area prior to agricultural development. References to “intermittent wetlands” throughout this section refer to this kind of activity.

1996 — 2003~~14~~

The Monterey Amendment called for ownership of the Kern Fan Element property to be transferred from the Department to the KCWA, which occurred in 1995~~6~~. In 1995, the KCWA received interim permits/authorizations from the USFWS and CDFG to initiate water banking to take advantage of a high availability of water due to a heavy snow pack in the Sierras. As a condition of the interim permit, KCWA was required to set aside permanent habitat mitigation land, which had moderate habitat value, or natural vegetation, until the long term HCP could be implemented on KWB Lands in the Kern Fan Element.⁹ The interim project was carried out in two stages. The first stage resulted in the rehabilitation of disused canals and inundation of approximately 1,500 acres of former agricultural land. Pre-construction surveys were conducted, and revealed poor habitat values throughout the Stage 1 area, and no suitable habitat for listed species.

The second stage resulted in the inundation of approximately 1,400 acres of grassland and fallow agricultural land, which had the potential to support listed species. Biological surveys were conducted in all areas proposed for disturbance by either construction or flooding and 58 potential San Joaquin kit fox dens were found to be unoccupied and destroyed, and the animals did not return prior to construction.¹⁰ Approximately 300 potential Tipton kangaroo rat burrows were located during surveys, but were not monitored for the presence of Tipton kangaroo rat. If any of these burrows were inhabited, then a take may have occurred if the animals were unable to escape.¹¹ Approximately one-quarter to one-third of a known population of San Joaquin woolly threads were inadvertently covered with excavated soils during project construction.¹² The location of this plant was not identified prior to construction, but upon discovering the damage, the area was flagged and avoided. Construction of the recharge basins resulted in the loss of potential San Joaquin kit fox and Tipton kangaroo rat habitat, the potential take of Tipton kangaroo rat, and the destruction of a portion of the San Joaquin woolly thread population. This was not fully mitigated for prior to project construction, but has been mitigated for through post-construction participation in the KWB HCP/NCCP.

Therefore, Stage 2 project activities would have resulted in significant impacts on special-status species, but these potential impacts were reduced to less-than-significant levels by implementing the KWB HCP/NCCP.

Since 1996, the KWBA has been responsible for land management of KWB Lands the Kern Fan Element property. The KWB Lands have been managed in accordance with a KWB HCP/NCCP approved by USFWS and CDFG in 1997 (see Appendix 7-7a). The KWB HCP/NCCP documents a plan to accomplish both water conservation and environmental objectives, mitigating project-specific impacts to less than significant at a regional level. The primary water conservation objective is the storage of water in aquifers during times of surplus for later recovery during times of shortage. The primary environmental objective is to set aside large areas of the Kern Fan Element property for endangered, threatened, and other sensitive species and to implement a program to protect and enhance the habitat. The KWB (a) has provided substantial and important benefits for 10 endangered and threatened species and other species of concern in the southern San Joaquin Valley, (b) is an important component of the strategy adopted by the USFWS to protect and recover endangered and threatened species in the southern San Joaquin Valley, and (c) is providing important wintering habitat for migratory birds by reestablishing intermittent wetland habitat on the alluvial fan of the Kern River lost as a result of regulation of Kern River flood flows.¹³

Under The KWB HCP/NCCP resulted in, the approximately 19,900-acre KWB Lands Kern Fan Element property was being divided up for different land uses (see Table 7.4-34), described as follows.

- Recharge Basins and Other Banking Facilities – Permanent operation of the banking facilities included the flooding of basins, constructing facilities for recovery of the water from underground aquifers and maintenance of all project facilities.

- KWBA Mitigation Parcel – a 635-acre conservation easement has been established for the KWBA. This easement will be managed by KWBA in accordance with the management plan established for the area.
- Compatible Habitat – This habitat is largely fallowed agricultural land that has become established as non-native annual grassland that has been preserved and managed around the banking facilities. It will provide upland habitat for San Joaquin kit foxes and other upland species.
- Sensitive Habitat – Three areas of sensitive habitat containing remnant native saltbush and valley sink scrub habitat have been identified. They are comprised of historic upland habitat and non-farmed locations on KWB Lands ~~the Kern Fan Element property~~ and will benefit native upland species. These areas will be protected throughout the life of the permit.
- Department Mitigation Land – A 530-acre conservation easement has been established on KWB Lands ~~the Kern Fan Element property~~ to mitigate other projects carried out by the Department prior to the transfer of this land to the KCWA. This easement will be managed by KWBA in accordance with the management plan established for the area.
- Farming – 3,170 acres of the project site may be farmed in a manner appropriate to soil conditions found on site. The land may also be used for water recharge and recovery purposes, including recharge basins, leveesberms, and related uses.
- Conservation Bank – 3,267 acres of potential and occupied habitat has been designated for a conservation bank. Under the KWB HCP/NCCP, KWBA may use, or sell up to 490 acres of this habitat for commercial development. Much of this land was pre-approved mitigation land by CDFG and is adjacent to other land preserved in the area. KWBA can use or sell up to 3,267 conservation credits to landowners, developers and others for mitigation for projects within the Master Permit Credit Area.

Between 1998 and 2003, the KWBA built an additional 4,080 acres of shallow recharge basins on KWB Lands ~~the Kern Fan Element property~~. Some of the acres were located within an area designated for farming.¹⁴ Of the original 3,267 acres of available conservation credits, 1,289,744 acres of conservation credits have been sold as of December 31, 201405.

Several measures were implemented in accordance with the KWB HCP/NCCP, to reduce impacts on native or migratory wildlife using ~~the Kern Fan Element property~~ KWB Lands, including:

- Maintaining water levels constant, to the extent possible to prevent impacts on birds nesting in the recharge basins;
- Slowly refilling basins and canals that have been idle for more than two years, so that any covered animals will be able to escape before drowning;
- Constructing shallow canal side slopes to allow animals to escape from the interior and extending internal access roads across new canals, which would provide access for animals to cross the canal when wet;
- Surveying unused canals that will be used in the near future, prior to the burrowing owl nesting season. Any burrows found will be collapsed, in consultation with the Resource Agencies, to prevent nesting in those locations;
- Vegetation removal from roadways, turnouts, interbasin structures, road crossings and control structures will be accomplished by burning, motor grading (used minimally), mowing, herbicide or hand. Vegetation removed from canals and basins will be accomplished by hand control, lightweight equipment (weed-eaters), grazing, mowing and burning; and

- Complying with the “Interim Measures for Use of Rodenticides in Kern County,” in order to prevent damage to facilities from rodents and to prevent the poisoning of listed species.

A Vegetation Management Plan as part of the KWB HCP/NCCP (Appendix 7-7c) was created to describe cost effective vegetation management and restoration practices for the long-term adaptive management and enhancement of the Kern Water Bank. Protection of existing and newly established sensitive habitats, vegetation management of compatible habitat using effective, low-cost adaptive methods and exotic pest plant control are primary goals under this management plan.

Periodic recharge operations result in the intermittent wetting and drying of recharge ponds. This mimics the cyclic pattern of intermittent wetlands that dominated this area prior to agricultural development. About 17,000 of the approximately 19,900 acres that compose the KWB Lands were farmed intensively before 1991. Now, the water conservation activities of the KWB are re-creating habitat along the recharge ponds, where marsh-like environments are established during recharge periods and create ideal habitat for waterfowl, shorebirds, raptors, and other native and migrating birds. Willows, cottonwoods, sedges, and other wetland vegetation have emerged along the edges of the recharge basins and earthen berms. As of 2014, more than 66 species of waterfowl have been sighted on KWB Lands, including Caspian tern, white-faced ibis, double-crested cormorant, Barrow’s goldeneye, purple martin, tricolored blackbird, and American white pelican.¹⁵ Many of these species have reproduced successfully on KWB Lands.¹⁶ By expanding available habitat for numerous species, recharge operations have result in nearly doubling the number of special-status species that have been documented to occur on KWB Lands (see Tables 7.4-2A and 7.4-4). The KWB HCP/NCCP and its Operations Manual, Vegetation Management Plan, and Waterbird Management Plan (see Appendices 7-7a, 7-7b, 7-7c, and 7-7d, respectively) provide ongoing management direction for KWB Lands.

Further, KWB activities expanded and protected riparian and other sensitive habitats, such as native saltbush and valley sink scrub habitat, on KWB Lands. KWB development also resulted in the conversion of intensively farmed lands to annual grassland habitat that supports numerous plant and wildlife species.

Vegetation management in upland areas is focusing on regenerating native grasses and plants that help to promote the threatened and endangered species associated with this area. This upland habitat is supporting large populations of raptors, kangaroo rats, rabbits, badgers, bobcats, and coyotes. Of particular importance are the populations of Tipton kangaroo rats, burrowing owls, and tricolored blackbirds. On occasion, San Joaquin kit fox has been observed on the property. Studies have suggested that the abundance of coyotes, a predator of the kit fox, may be suppressing kit fox populations.¹⁷

Under the KWB HCP/NCCP, the KWBA has authorization to incidentally take (including harm or harass) 161 covered species that are listed, or may be listed in the future under FESA (Appendix 7-7e). Of these species, ~~fourteen~~ 25 special-status plants and animals have recorded occurrences on ~~KWB Lands~~ the Kern Fan Element property. Since the approval of the KWB HCP/NCCP, one incident of take of three individual animals has been reported or is known to have occurred on the KFE property; in 1999, during the construction of the KWB Canal, three Tipton kangaroo rats were captured and temporarily relocated to avoid harming them.¹⁸ After construction was complete, they were reintroduced into the area they had originally inhabited. ~~no take has been reported or is known to have occurred in the Kern Fan Element property.~~¹⁹

In addition to the KWB HCP/NCCP, ~~the 1997 Montereyan IS~~ Initial Study and Addendum ~~were~~ prepared for the ~~KWBern Water Bank~~, which included mitigation measures to reduce impacts on terrestrial biological resources (see Appendix 7-6a).

Therefore, the impact of KWB activities from 1996 to 2014 with regard to terrestrial biological resources was **less than significant**.

In addition, KWB activities, through implementation of the KWB HCP/NCCP, resulted in a benefit to terrestrial biological resources.

Mitigation Measures

None required.

Future Impacts 2015 – 2030

~~As noted under above, the KWBA manages KWB Lands ~~land within the Kern Fan Element property~~ in accordance with a KWB HCP/NCCP, approved by the USFWS and CDFG in 1997. Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed. ~~As of December 31, 2004, 4,699 acres of recharge basins²⁰ have been constructed with an additional 1,201 acres to be developed. In addition, the KWBA constructed 2,415 acres of recharge basins on lands designated for farming, and constructed 258 acres of other banking facilities, with approximately 289 more acres that could be developed.~~~~

~~Because KWB Lands ~~are the Kern Fan Element property~~ is under a HCP/NCCP, the KWBA is required to follow specific guidelines to prevent take of special-status species and to enhance and preserve the natural habitat currently present. Under the conditions of the KWB HCP/NCCP, the KWBA is required to prepare annual reports summarizing activities within KWB Lands ~~the Kern Fan Element property~~ including updates on the water supply management and related activities; any amendments to the HCP/NCCP; a summary of any take occurrences; land and habitat management and mitigation measures; monitoring programs and studies; mitigation measures and cooperation with wildlife agencies; and the status of conservation credits. An independent study regarding the impacts related to the transfer, development, and operation of the KWB in light of the Kern Environmental Permits, documented that the KWB is operating as intended and within the confines of the KWB HCP/NCCP. The KWB HCP/NCCP requires that KWB activities continue to follow the KWB HCP/NCCP requirements for 75 years from 1997.~~

~~Under the Settlement Agreement, additional restrictions have been placed on allowable uses of KWB Lands ~~the Kern Fan Element property~~. The KWBA will retain title to KWB Lands ~~the Kern Fan Element property~~. The KWBA shall continue to use the property for operation of a water bank and other uses authorized by the KWB HCP/NCCP, so long as such use remains legally and economically feasible. If KWBA determines use of the property as a water bank becomes legally or economically infeasible, and the property cannot feasibly be used for SWP purposes provided in California Water Code §12930 et seq. or if DWR and KWBA are unable to agree on terms and conditions for such SWP use, then the KWBA may transfer or develop the property for another purpose provided that no unmitigable adverse environmental impacts result from the new use. Any net proceeds of land transfer or development will be used by the KWBA for water management purposes. Furthermore the 490 acres, designated as a "Commercial Development Zone" in the KWB HCP/NCCP, may not be developed and are now included~~

in the conservation bank land use component. Provided that there is enough development within the Master Permit Credit Area, KWB activities ~~the proposed project~~ would insure the complete build out of the conservation bank, thus protecting a total of 3,267 acres of potential or occupied habitat.

Periodic recharge operations result in the intermittent wetting and drying of recharge ponds. This mimics the cyclic pattern of intermittent wetlands that dominated this area prior to agricultural development.

It is expected that the implementation of the mitigation measures and the KWB HCP/NCCP, in particular, will continue to result in a beneficial impact on terrestrial biological resources from KWB activities. While ~~no~~ minimal incidental take has occurred since the creation of the Kern Water Bank (with exception of San Joaquin woolly threads), it is possible that KWB activities ~~proposed project~~ could result in take during construction, operation, and maintenance, through collapsed burrows, road kills, crushing ~~ing~~ by grading equipment, harassment, habitat loss, drowning, etc. Special-status plants could also be adversely affected during future KWB construction of new facilities and continued operation and maintenance. This would result in a potentially significant impact on special-status terrestrial wildlife.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to terrestrial biological resources could be **potentially significant**.

Mitigation Measures

The ~~proposed project~~ would result in impacts to terrestrial biological resources on the Kern Fan Element property that would be reduced to **less than significant** through the following mitigation measures currently implemented by the KWBA. These measures were outlined in the Initial Study and Addendum to Monterey Amendment EIR of the KWBA, Kern Water Bank HCP/NCCP. Mitigation Measure 7.4-3 would reduce potentially significant impacts of KWB activities to terrestrial biological resources to less than significant. The use of a biological monitor, and special construction activities and on-going practices, will result in a heightened awareness and education regarding sensitive biological resources, which will reduce the potential for impacts on special-status species. In addition, the use of a project representative as a liaison between the KWBA and the resource agencies will expedite notification regarding any take of a listed animal.

Mitigation Measure 7.4-3 has terms largely excerpted directly from the KWB HCP/NCCP and the 1997 Monterey IS and Addendum, which KWBA is obligated to implement (See Section 7.0.4.2.1, KWB HCP/NCCP Permits; Section 7.0.4.3.1, 1997 Monterey Initial Study and Addendum; and Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, future KWB activities from 2015 to 2030 with regard to terrestrial biological resources would be **less than significant, with mitigation**.

In addition, KWB activities, through implementation of the KWB HCP/NCCP, are likely to result in a benefit to terrestrial biological resources.

7.4-3 *KWBA will implement the following terms required of KWBA as specified in the 1997 Monterey IS and Addendum (Appendix 7-6a), 2016 KWBA Resolution, and KWB HCP/NCCP, including Appendix A (Kern Water Bank Operations Manual), Appendix C (Kern Water Bank Vegetation Management Plan, and Appendix D (Kern Water Bank Waterbird Management Plan) (see Appendices 7-7a, 7-7b, 7-7c, and 7-7d, respectively):*

a) *Biological Monitor*

A qualified biologist shall monitor all ground disturbing activities during construction in the Sensitive Habitat Sector and will oversee measures undertaken to reduce the take of listed species.

b) *Construction Practices*

- i. *Delineation of Disturbance Areas – During construction, KWBA shall clearly delineate disturbance area boundaries by stakes, flagging, or by reference to terrain features, as provided in the KWB HCP/NCCP directed by CDFG and USFWS to minimize degradation or loss of adjacent wildlife habitats during operation.*
- ii. *Signage – During construction, KWBA shall post signs and/or place fencing around construction sites to restrict access of vehicles and equipment unrelated to site operations.*
- iii. *Resource Agency Notification – At least 20 working days prior to initiating ground disturbance for project facilities in designated salvage/relocation areas, KWBA shall notify the Fresno Field Office of CDFG and the Sacramento Field Office of USFWS of its intention to begin construction activities at a specific location and on a specific date. The agencies will have ten working days to notify the KWBA of their intention to salvage or relocate listed species in the construction area. If KWBA is notified, it shall wait an additional five days to allow the salvage/relocation to take place.*
- iv. *Salvage and Relocation – KWBA shall allow time and access to USFWS and/or CDFG, or their designees, to relocated listed species, at the Resource Agencies' expense, from construction areas prior to disturbance of areas that have been identified by the Resource Agencies as having known populations of the listed species they wish to salvage or relocate.*
- v. *Construction Site Review – All construction pipes, culverts, or similar structures with a diameter of three inches or greater that are stored at a construction site on the Kern Water Bank for one or more overnight periods shall be thoroughly inspected for trapped kit foxes and other animals before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a kit fox or other animal is discovered inside a pipe, that section of pipe shall not be moved or, if necessary, shall be moved only once to remove it from the path of construction activity until the animal has escaped.*
- vi. *Employee Orientation – An employee orientation program for construction crews, and others who will work on-site during construction, shall be conducted and shall consist of a brief consultation in which persons knowledgeable in endangered species biology and legislative protection explain endangered species concerns. The education program shall include a discussion of the biology of the listed species, the habitat needs of these species, their status under FESA and CESA, and measures being taken for the protection of these species and their habitats as a part of the project. The orientation program shall be conducted on an as needed basis prior to any new employees commencing work on the Kern Water Bank. Every two years or at the beginning of construction for the Supply/Recovery canal, a refresher course will be conducted for employees previously trained. A fact sheet conveying this information shall also be prepared for distribution to all employees. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection*

measures. These forms shall be filed at KWBA's office and shall be accessible by CDWFG and USFWS.

- vii. *Standards for Construction of Canals – Concrete-lined canals will have a side slope of 1.5 to 1 or less and the sides will have a concrete finish which will assist in the escape of animals. If canals are determined by CDWFG or USFWS to be substantial impediments to kit fox movement, plank or pipe crossings will be provided across concrete canals in areas identified as having high kit fox activity.*

c) *On-Going Practices*

- i. *Equipment Storage - All equipment storage and parking during site development and operation shall be confined to the construction site or to previously disturbed off site areas that are not habitat for listed species.*
- ii. *Traffic Control - KWBA's project representative shall establish and issue traffic restraints and signs to minimize temporary disturbances. All construction related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas. Project related vehicles shall observe a 25 MPH speed limit in all project areas except on county roads and state and federal highways.*
- iii. *Food Control - All food-related trash items such as wrappers, cans, bottles, and food scraps generated both during construction and during subsequent facility operation shall be disposed of in closed containers and shall be regularly removed from the site. Food items may attract kit foxes onto a project site, consequently exposing such animals to increased risk of injury or mortality.*
- iv. *Dog Control - To prevent harassment or mortality of kit foxes or destruction of kit fox dens or predation on this species; no domestic dogs or cats, other than hunting dogs, shall be permitted on-site.*
- v. *Pesticide Use - Use of rodenticides and herbicides on the site shall be permitted in accordance with the Vegetation Management Plan, which incorporates by reference the Interim Measures for Use of Rodenticides in Kern County, and which will incorporate by reference any other applicable laws, rules, and regulations regarding the use of pesticides as they take effect.*

d) *Project Representatives*

KWBA shall designate a specific individual as a contact representative between KWBA, USFWS, and CDWFG to oversee compliance with protection measures-detailed herein. KWBA shall provide written notification of the contact representative to CDWFG and USFWS within 30 days of issuance of the Permits and the Management Authorizations. Written notification shall also be provided by KWBA to CDWFG and USFWS in the event that the designee is changed.

e) *Notification Regarding Dead, Injured or Entrapped Listed Animals*

Any employee or agent of KWBA who kills or injures a San Joaquin kit fox, blunt nosed leopard lizard, Tipton kangaroo rat, San Joaquin antelope squirrel, or other listed species listed as a threatened or endangered animal under FESA or CESA, or who finds any such animal either dead, injured, or entrapped on the Kern Water Bank shall report the incident immediately to KWBA's representative who shall, in turn, report the incident or finding to

USFWS and CDFWG. In the event that such observations are of entrapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape unimpeded. In the event that such observations are of injured or dead animals, KWBA shall immediately notify USFWS and CDFWG by telephone or other expedient means. KWBA shall then provide formal notification to USFWS and CDFWG, in writing, within three working days of the finding of any such animal(s). Written notification shall include the date, time, location, and circumstances of the incident.

The USFWS contact for this information shall be the Assistant Field Supervisor for Endangered Species, Sacramento Field Office. The CDFWG contact shall be the Environmental Services Supervisor at the San Joaquin Valley-Southern Sierra Region Headquarters.

USFWS or CDFWG will be notified if any other animal, which is otherwise a listed species, is found dead or injured.

f) Construction of Supply/Recovery Canal

Within 60 days prior to the construction of the supply/recovery canal within the zone marked within the Map of the Kern Water Bank, KWBA shall conduct a limited survey within the area of the Kern Water Bank, which will be affected by that construction, with the sole goal of identifying potential San Joaquin kit fox dens. KWBA shall contact USFWS and CDFWG pursuant to the salvage procedures set forth above if any kit fox dens are found.

g) Take Avoidance Protocol for Fully Protected Species

Although a population of blunt nosed leopard lizards was relocated to the Kern Water Bank, there is no known present occurrence of them. Existing data on the blunt nosed leopard lizard at the Kern Water Bank indicates that populations, if they exist, occur within habitat set asides (either sensitive, compatible, or conservation bank habitat), thus the likelihood of take from project construction, operation, and maintenance is negligible. However, in the future adaptive management measures may expand to areas of suitable habitat.

Three other species, which may be found on the Kern Water Bank, are also state designated fully protected species: American peregrine falcon, Greater sandhill crane, and White-tailed kite. The likelihood of the take of any of these species from project construction, operation, and maintenance is negligible due to their mobility and preferred habitats. ~~However, to avoid any take of these species, the same take avoidance protocol as set out for the blunt nosed leopard lizard shall apply to each of these three species.~~

KWBA will comply with the terms of the NCCP Approval and Take Authorization as it relates to~~Until such time that the KWBA obtains appropriate authorization for take of the state-designated fully protected species (Appendix 7-e)~~blunt-nosed leopard lizard by the Fish and Game Commission,~~t~~ The following take avoidance protocol shall apply in any areas that contain suitable habitat for fully protected species not covered by authorization for take of state-designated fully protected species identified in this subsection (g) of the blunt-nosed leopard lizard:

- i. A qualified biologist shall survey any areas proposed for project related disturbance that contain suitable habitat for fully protected species ~~the blunt-nosed leopard lizard~~ to determine the likelihood of presence. ~~Suitable habitat consists of valley and foothill grasslands, saltbush scrubland, iodine bush grassland, and alkali flats.~~

- ii. ~~If these fully protected species blunt nosed leopard lizards are found to occur in areas proposed for project facilities construction or maintenance, consideration of avoidance should take place. first. If avoidance is not practicable, then the blunt nosed leopard lizard will be trapped and relocated prior to disturbance at KWBA's expense in accordance with the applicable annual management plan. This work must be done by or under the direction of USFWS staff by persons with appropriate experience and with their own take for scientific purposes permits. This procedure will avoid any violation of state law.~~

The use of a biological monitor, and special construction activities and on- going practices will result in a heightened awareness and education regarding sensitive biological resources, which will reduce the potential for impacts on special-status species. In addition, the use of a project representative as a liaison between the KWBA and the resource agencies will expedite notification regarding any take of a listed animal. While take of a fully protected species is not anticipated, this mitigation outlines avoidance protocol to further reduce the likelihood of said take. Together these mitigation measures and the beneficial net increase of habitat for special- status species through implementation of the HCP/NCCP will reduce any potential impact to a less-than-significant level.

ENDNOTES

1. California Department of Water Resources. 1986 (December). *Final Environmental Impact Report: Artificial Recharge, Storage, and Overdraft Correction Program, Kern County, California*. Sacramento, CA. Pages 35–63.

2. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element Draft Supplemental Environmental Impact Report*. Sacramento, CA. Pages 25–55.

3. Central Coast Water Authority. 1995 (May). *Draft Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA. Pages 4-38 through 4-65.

4. Central Coast Water Authority. 1995 (October). *Final Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA.

5. Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA.

- Kern Water Bank Authority. 1998 (January 1). *Kern Water Bank Authority 1997 Annual Compliance Report*. Bakersfield, CA.

- Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan Annual Compliance Report—January 1, 1998 through December 31, 1998*. Bakersfield, CA.

- Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.

- Kern Water Bank Authority. 2001 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2000 Annual Compliance Report and 2001–2002 Management Plan*. Bakersfield, CA.

- Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA.

- Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Compliance Report and 2003–2004 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Compliance Report and 2004–2005 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Compliance Report and 2005–2006 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Compliance Report and 2006–2007 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Compliance Report and Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA.

Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA.

6. Central Coast Water Authority. 1995 (May). *Draft Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA. Pages 4-38 through 4-65. *Central Coast Water Authority, Draft Program Environmental Impact Report for the Implementation of the Monterey Agreement – Statement of Principles by the*

~~*State Water Contractors and the State of California Department of Water Resources for Potential Amendments to the State Water Supply Contracts, May 1995.*~~

7. Category 1 candidate species are taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. Category 2 candidate species are those for which information now in the possession of the USFWS indicates that proposing to list as endangered or threatened is possibly appropriate, but for which persuasive data on biological vulnerability and threat are not currently available to support proposed rules.
8. California Native Plant Society. 2001. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (sixth edition)*, Sacramento, CA.
9. Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA.
10. ~~Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA. Pages 3–4 and 6.~~
11. ~~Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA. Pages 3–4 and 6.~~
12. ~~Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA. Page 6.~~
13. White, Wayne. Testimony: Declaration of Wayne White, August 28, 2012.
14. ~~Parker, Jonathan, Kern Water Bank Authority, personal communication with John Davis, EIP team, October 2003.~~
15. Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/ Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA. Page 1.
16. ~~Kern Water Bank Authority. 2015. Sensitive Wildlife Species. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/376>. Accessed: December 1 May 15, 2015.~~
17. ~~Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/ Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA. Page 21.~~
18. ~~Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA. Page 3.~~
19. ~~Harding, Cheryl, Administrator, Kern Water Bank Authority, email communication with Emily Keller, EIP team, December 18, 2003.~~

20. ~~Kern Water Bank Authority, *Habitat Conservation Plan/Natural Community Conservation Plan*, 2004 Annual Compliance Report and 2005-2006 Management Plan, May 2005.~~

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7.5 VISUAL RESOURCES (NEW)

7.5 VISUAL RESOURCES (NEW)

7.5.1 INTRODUCTION

7.5.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.5 identified potential impacts to visual resources as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.5 that discusses KWB activities. All other text in DEIR Section 7.5 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.5-1A identifies the potentially affected environmental resources from impacts of KWB activities on visual resources.

TABLE 7.5-1A**IMPACTS OF KWB ACTIVITIES ON VISUAL RESOURCES**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Changes in visual character associated with construction and operation of groundwater storage facilities	7.5-3

During public review of the Notice of Preparation for the Monterey Plus EIR, interested parties submitted no comments on visual resources.

7.5.1.2 Analytical Method

Qualitative assessment of impacts on visual resources was conducted in accordance with standard professional practices for documents prepared in compliance with the California Environmental Quality Act (CEQA) documents. Factors considered in the analysis included:

- the nature and magnitude of changes in visual character;
- the number and importance of vantage points from which changes would be viewed;
- the number of viewers who would be affected; and
- likely reactions to changes in visual character.

Substantial changes are defined as changes beyond those normally observed because of historical variation of fluctuation, changes that are disproportionate to any previously experienced, or irreversible changes that would negatively affect an average person's impression of an area. Site visits to the facilities were used to record the visual character of the facilities.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to visual resources, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.5.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For the purposes of this REIR, impacts to visual resources would be considered significant if KWB activities would:

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources including but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway corridor;
- substantially degrade the visual character of any area; or
- create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

KWB activities would not create a new source of substantial light or glare which would adversely affect day or nighttime views. Development projects are distant from KWB Lands and would not overlap visually with KWB activities. KWB activities would also not contribute to skyglow and KWB lands are mostly open lands with limited lighting at a few facilities. Therefore light, glare, or skyglow are not discussed further.

7.5.2 ENVIRONMENTAL SETTING

7.5.2.1 Physical Setting in 1995

Prior to the California Department of Water Resources' (Department's) purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities (valley saltbush scrub, Great Valley Mesquite scrub, and valley sacaton grassland) and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities.

The KFE property included a number of agricultural wells and conveyance facilities that had been constructed primarily to deliver irrigation water for the agricultural activity occurring then and historically on the property. A Memorandum of Understanding was signed between the Department and KCWA on March 25, 1987, that provided for the phase-out of all agricultural production in the KFE by the end of 1993. In fact, one of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE property.

Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services Inc., had a residence with an equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property (see Revised Appendix E). The property acreage lies on both sides of the Kern River but does not include the river itself, or the lands within the river levees. The terrain is flat with no more than a few feet of topographical relief. In 1995, there were no major structures on the KFE property except for Interstate 5 (I-5), the Cross Valley Canal, and some abandoned tanks and other oil field equipment, and about 3,000 acres of recharge ponds.

7.5.2.2 Changes in Physical Setting between 1996 and 2014⁰³

The KWB facilities include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; Kern Water Bank Authority (KWBA) operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (> 36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct.

Most of the changes in visual resources on KWB Lands between 1996 and 2014 are attributable to the construction and operation of recharge ponds and the KWB Canal and are described above. Conservation Bank Areas have also been established pursuant to the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP). KWBA manages KWB Lands in

accordance with KWB HCP/NCCP, which allows developed uses on about 4,000 of KWB Lands (see Appendix 7-7a). Developed uses included farming, permanent facilities for the KWB, and commerce. Approximately 490 acres of land adjacent to Interstate 5 (I-5) is designated for possible commercial use. Between 1995 and 2014, no development occurred on the 490-acre parcel. After 2003, the development of this parcel was prohibited by the Settlement Agreement.

7.5.2.3 Regulatory Setting in 1995

The regulatory setting covering KWB Lands pertinent to visual resources consists of several provisions of the Kern County General Plan and Metropolitan Bakersfield General Plan that do not affect the analysis of visual impacts on KWB Lands.

7.5.2.4 Changes in Regulatory Setting between 1996 and 2014⁰³

Kern County General Plan

There have been no substantial changes in the regulatory framework since 1996 that would affect the analysis of visual resources impacts, except for the adoption in 2004 of the Scenic Route Corridors (Section 2.3.9) in the Kern County General Plan. Highways in Kern County that provide access to existing and potential groundwater bank areas are not officially designated as scenic routes by Caltrans or in the County General Plan.

Metropolitan Bakersfield General Plan

The *Metropolitan Bakersfield General Plan*, adopted in 2002, did not include any substantial changes that would affect the analysis of visual resources on KWB Lands.

7.5.3 IMPACTS AND MITIGATION MEASURES

7.5-3 Implementation of KWB activities could potentially affect visual resources.

1996 — 2014

In 1995, under the Kern County Water Agency (KCWA) flood emergency program and prior to the formation of the KWBA, KCWA and the other future participants of the KWBA constructed approximately 3,034 acres of recharge ponds. From 1998 through 2002, KWBA constructed an additional 4,290 acres of recharge ponds, some of which overlapped earlier constructed ponds, for a total net pond area of 7,114 acres. An additional 70 acres of ponds were constructed in 2009 for a total pond area of 7,184 acres. KWBA subsequently constructed the KWB Canal and several wells and pump stations. The KWB Canal has a uniform cross-section and is confined between earthen berms. It is a prominent feature in the landscape but is visually consistent with other waterways in the area including the Cross Valley Canal and the California Aqueduct.

Although these land use changes have altered the appearance of KWB Lands, they did not alter the overall visual character of the area or cause any substantial visual resource impacts. The visual changes are primarily seen by travelers on I-5, and the changes are consistent with other water facility features common in the area.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to alteration of visual resources was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. The IRWM program ponds have been sited. The locations of additional ponds are approximate but consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Developed uses included permanent KWB facilities, farming, and commerce. Approximately 490 acres of land adjacent to Interstate 5 (I-5) is designated for possible commercial use. Between 1995 and 2014, no development occurred on the 490-acre parcel. Since 2003, the Settlement Agreement prohibits development of this parcel.

As a consequence of KWB activities, approximately 1,052 acres of additional lands would be converted to recharge ponds on KWB Lands. Although these changes would alter the appearance of KWB Lands, the alteration in appearance would be minimally visible and consistent with other water facility and visual features common in the area.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to alteration in visual resources would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

None.

7.6 AGRICULTURAL RESOURCES (NEW)

7.6 AGRICULTURAL RESOURCES (NEW)

7.6.1 INTRODUCTION

7.6.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.6 identified potential impacts to agricultural resources as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.6 that discusses KWB activities. All other text in DEIR Section 7.6 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.6-1 identifies the potentially affected environmental resources from impacts of KWB activities on agricultural resources.

TABLE 7.6-1

IMPACTS OF KWB ACTIVITIES ON AGRICULTURAL RESOURCES

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Monterey Amendment		
Transfer of Kern Fan lands, and KWB activities	Acreages of irrigated farmland	7.6-1

During public review of the Notice of Preparation (NOP) for the Monterey Plus EIR, the State Department of Food and Agriculture commented on the NOP and noted that the proposed project has the potential for significant positive impacts on agricultural water users but at the same time could have long-term adverse impacts on agriculture from water transfers away from agricultural to urban users. Specific issues raised include permanent loss of agricultural production capacity associated with project growth-inducing impacts and cumulative loss of agricultural production and resources. As stated above, indirect impacts as a result of population growth from KWB activities are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

This section describes Kern County's agricultural land uses; identifies the acreages of agricultural land in Kern County, including Important Farmland and Grazing Land; evaluates any conversion of agricultural lands to nonagricultural lands; conversion of any Prime, Unique, or Important Farmland; and addresses changes in local and regional cropping patterns. This section also determines the significance and quality of agricultural land within the KWB Lands. Additional information on land uses on and adjacent to KWB Lands is provided in Section 7.10, Land Use and Planning.

7.6.1.2 Analytical Method

Evaluation of the potential impacts of the KWB activities on agriculture and forestry resources was based primarily on field and aerial photographic review, the KWB HCP/NCCP annual compliance and management reports, the 1995 and 2014 Kern County Agricultural Commissioner crop reports, and the *Kern County General Plan*. In addition, a focused air quality analysis in 2015 provided data related to the KWB participants' service area, which identified agricultural acreage served with KWB water by KWBA participants: Dudley Ridge Water District in Kings County; and Semitropic Water Storage District, Westside Mutual Water Company, and Wheeler Ridge-Maricopa Water Storage District collectively located in Kern County.¹

The Important Farmland Map for Kern County, produced by the California Department of Conservation (DOC) Division of Land Resource Protection, was used to evaluate the agricultural significance of the lands within and in the vicinity of the KWB. Geographic information system data were used to determine the potential acreage of designated farmland affected by KWB activities. Appendix G of the CEQA Guidelines focuses agricultural analysis on conversion of agricultural land, including Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, to nonagricultural uses.

7.6.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For purposes of this REIR, impacts on agricultural resources would be considered significant if the KWB activities would:

- Result in a permanent conversion of a substantial acreage of Prime, Unique, or Statewide Important Farmland;

- Result in a substantial inconsistency with objectives of local, regional and state plans, including zoning for agricultural use or Williamson Act Contracts;
- Result in a substantial conflict with existing zoning for, or cause rezoning of, forestland (as defined in PRC Section 12220(g)), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));
- Result in a substantial loss of forestland or conversion of forestland to nonforest use; or
- Involve other changes in the existing environment that, because of their location or nature, could result in a permanent conversion of a substantial acreage of Farmland to nonagricultural use or conversion of forest land to nonforest use.

The following topics are not discussed further in this REIR because no or minimal impact would occur with regard to these potential impacts:

- KWB facilities, including recharge ponds, the KWB Canal, recovery wells, berms, and conveyance pipelines, have been constructed within the existing KWB Lands. Construction of future KWB facilities would occur within KWB Lands. None of the KWB Lands is held under a Williamson Act contract. Therefore, KWB activities would not conflict with an existing Williamson Act contract or result in the cancellation of a Williamson Act contract.
- KWB Lands are zoned by Kern County as A (Exclusive Agriculture). The purpose of the A zoning district is to designate areas suitable for agricultural uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to nonagricultural uses. Uses in the A zoning district are limited primarily to agricultural uses and other activities compatible with agricultural uses. KWB facilities were developed in areas designated by the DOC as Grazing Land, Urban and Built-Up Land, and Other Land. Construction, use, and maintenance of groundwater recharge facilities, such as the KWB Canal, recharge ponds, recovery wells, pumps, berms, and conveyance pipelines, are permitted uses within the A zoning district. Therefore, KWB activities would not result in conflicts with existing zoning for agricultural use. See Section 7.10, Land Use Planning, for more discussion on zoning compatibility.
- KWB Lands are not zoned as forestland, timberland, or a Timberland Production Zone. Thus, KWB activities would not conflict with existing zoning for, or cause rezoning of, forestry resources; or result in the loss of forestland or conversion of forestland to nonforest use.

Section 12220(g) of the California Public Resources Code (PRC) defines forestland as land that can support 10 percent native tree cover and woodland vegetation of any species (including hardwoods) under natural conditions, and that allows for management of one or more forest resources (timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation) and other public benefits. The KWB Lands do not contain forestland as defined by PRC Section 12220(g). For these reasons, KWB activities would not result in the loss of forestland or conversion of forestland to nonforest uses.

7.6.2 ENVIRONMENTAL SETTING

7.6.2.1 Physical Setting in 1995

In 1995, Kern County included approximately 1,309 square miles (837,800 acres) of harvested agricultural land. According to the Kern County Agricultural Commissioner, the total gross valuation for all agricultural commodities produced in Kern County in 1995 was approximately \$1.9 billion. Grapes had the highest crop value (\$416 million); cotton, including processing cotton seed, was the number

two commodity (\$293 million); followed by citrus (\$230 million); almonds (\$168 million); and milk (\$101 million).²

In 1995, most agricultural acreage in Kern County was used to grow field crops (409,005 acres), with cotton comprising over two-thirds of this acreage (309,850 acres). Fruit crops had the second highest acreage (92,809 acres), followed by nut crops (90,323 acres) (Table 7.6-2).

Crop Type	Acres
Nuts ¹	90,323
Citrus ²	40,082
Fruit ³	92,809
Seed ⁴	2,333
Field ⁵	527,559
Vegetable ⁶	84,677
Total	837,783

Notes:

1. Nut crops consist of almonds, pistachios, and walnuts.
2. Citrus crops consist of grapefruit, oranges, lemons, and tangerines.
3. Fruit crops include apples, apricots, avocados, blueberries, cherries, grapes, raspberries, nectarines, olives, peaches, persimmons, plums, strawberries, and tomatoes.
4. Seed crops include cotton seed; alfalfa and wheat seed; and vegetable seed, including cabbage, carrots, lettuce, onion, and potatoes.
5. Field crops include barely, beans, corn, cotton, hay, safflower, sugarcane, and wheat.
6. Vegetable crops include cantaloupe, carrots, corn, lettuce, peppers, onions, potatoes, and watermelons.

Sources: Kern County 1995³, 2014⁴

Kern Water Bank Participants' Service Area Agricultural Land Uses

Similar to the countywide acreage shown in Table 7.6-2, most active agricultural acreage in the KWB participants' service area⁵ was used to grow field crops (98,961 acres), with cotton comprising over two-thirds of this total (68,975 acres). Fruit crops had the second highest acreage (92,809 acres), followed by nut crops (90,323 acres) (Table 7.6-3).

Kern County Farmland Conversion

The DOC Important Farmland classifications—Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance—recognize the land's suitability for agricultural production by considering physical and chemical characteristics of the soil, such as soil temperature range, depth of the groundwater table, flooding potential, rock fragment content, and rooting depth. The classifications also consider location, growing season, and moisture available to sustain high-yield crops.

DOC estimated that Kern County had approximately 1,603,794 acres of agricultural land in 1996, of which approximately 708,739 acres were identified as Important Farmland and 895,055 acres were identified as Grazing Land.⁶ Table 7.6-4 summarizes the DOC farmland conversion data and identifies the 1994 and 1996 acreages of agricultural land in Kern County. Only 49 percent of Kern County was surveyed in 1994 and 1996 because United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) soil surveys that identified soil quality for agricultural uses were not available for the remainder of the county.⁷ Therefore, the amount of agricultural land conversion is likely greater than shown in Table 7.6-4.

TABLE 7.6-3

AGRICULTURAL ACREAGE IN KERN WATER BANK PARTICIPANTS' SERVICE AREA*, 1995

Crop Type	Acres
Nuts ¹	34,867
Citrus ²	7,321
Fruit ³	15,631
Field ⁴	98,961
Vegetable ⁵	15,717
Total	172,497

Notes:

* The Kern Water Bank participants' service area consists of lands served with KWB water: Dudley Ridge Water District in Kings County, and Semitropic Water Storage District, Westside Mutual Water Company, and Wheeler Ridge-Maricopa Water Storage District collectively in Kern County.

1. Nut crops consist of almonds and pistachios.
2. Citrus crops consist of grapefruit, oranges, lemons, and tangerines.
3. Fruit crops include apples, apricots, grapes, and tomatoes.
4. Field crops include alfalfa, beans, corn, cotton, and safflower.
5. Vegetable crops include asparagus, broccoli, cabbage, carrots, garlic, lettuce, melons, and onions.

Sources: Insight Environmental Consultants 2015⁸; data compiled by AECOM 2016.

TABLE 7.6-4

SUMMARY OF AGRICULTURAL LAND CONVERSION IN KERN COUNTY, 1994–1996¹

Important Farmland Category	Acres		Net Change (1994–1996)	
	1994	1996	Acres	Percent
Prime Farmland	550,461	539,556	-10,905	-2.0
Farmland of Statewide Importance	119,029	113,493	-5,536	-4.9
Unique Farmland	56,603	55,690	-913	-1.7
Farmland of Local Importance ²	–	–	–	–
Important Farmland Subtotal	726,093	708,739	-17,354	-2.4
Grazing Land	877,218	895,055	17,837	2.0
Agricultural Land Total	1,603,311	1,603,794	483	0.03

Notes:

1. Only 49 percent of Kern County was surveyed in 1994 and 1996 because United States Department of Agriculture, Natural Resources Conservation Service soil surveys that identified soil quality for agricultural uses were not available for the remainder of the county. The amount of agricultural land conversion is likely greater than shown in the table.
2. The Kern County Board of Supervisors determined that no Farmland of Local Importance would be designated in Kern County.

Source: DOC 1998⁹

Overall, the total acreage of Important Farmland decreased by approximately 2.4 percent between 1994 and 1996, and the total acreage of Grazing Land increased by 2.0 percent over the 2-year period. In total, the acreage of agricultural land increased by approximately 0.03 percent between 1994 and 1996 (Table 7.6-4). The majority of losses in acreage of irrigated Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, or Unique Farmland) were caused by reclassification of Important Farmland categories to Grazing Land resulting from following of KWB Lands.¹⁰

Existing Agricultural Uses

Prior to the Department's purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. Most of the land was used for agriculture, and irrigation water was provided by surface water deliveries by the former James-Pioneer Improvement District of North Kern Water District and by groundwater pumping. A memorandum of understanding signed between the Department and KCWA on March 25, 1987, provided for the phase-out of all agricultural production on the KFE property by the end of 1993. One of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE Property.

7.6.2.2 Changes in Physical Setting between 1996 and 2014

Kern County

Kern County is the third largest producer of agricultural products in California and produces more than 120 different crops, including more than 20 types of fruit and nuts; more than 50 types of vegetables; more than 20 types of field crops; and lumber, nursery stock, livestock, poultry, dairy, and apiary products. Kern County includes approximately 1,370 square miles (approximately 877,151 acres) of harvested agricultural land.

According to the Kern County Agricultural Commissioner's most recent report, the total gross valuation for all agricultural commodities produced in Kern County in 2014 was approximately \$7.6 billion. Grapes had the highest crop value (\$1.7 billion), almonds were the number two commodity (\$1.5 billion), followed by milk (\$915 million), citrus (\$892 million), and cattle (\$428 million).¹¹ This cropping pattern is similar to 1995 conditions where grapes, almonds, and milk accounted for the highest crop values.

Although there was a relatively small increase in agricultural acreage in Kern County (approximately 1.2 percent) between 1996 and 2014, the cropping patterns within the county changed substantially. As shown on Table 7.6-5, the acreage of nut crops increased by approximately 206 percent and almonds accounted for more than 65 percent of the total nut crops. Specifically, almond production increased by approximately 610 percent between 1996 and 2014 within Kern County alone.¹² Other counties, including Fresno, Kern, Madera, and Stanislaus, experienced a similar shift to orchard crops.¹³ The acreages of annual seed, field, and vegetable crops all decreased between 1996 and 2014 within Kern County.

Kern Water Bank Participants' Service Area Agricultural Land Use

Similarly, most active agricultural acreage in the KWB participants' service area¹⁴ shows a relatively small increase in agricultural acreage (approximately 3.7 percent) between 1995 and 2015, but the cropping patterns changed substantially. As shown on Table 7.6-6, the acreage of nut crops increased by approximately 189 percent and almonds accounted for more than 60 percent of the total nut crops. The acreages of annual seed, field, and vegetable crops all decreased between 1995 and 2015.

TABLE 7.6-5**AGRICULTURAL ACREAGE IN KERN COUNTY, 1996–2014**

Crop Type	Acres		Net Change (1996–2014)	
	1996	2014	Acres	Percent
Nuts ¹	98,756	302,694	203,938	206.5
Citrus ²	41,745	64,234	22,489	53.8
Fruit ³	93,111	143,380	50,269	53.9
Seed ⁴	2,257	1,550	-707	-45.6
Field ⁵	538,648	298,843	-239,805	-80.2
Vegetable ⁶	92,486	66,450	-26,036	-39.2
Total	867,003	877,151	10,148	1.2

Notes:

1. Nut crops consist of almonds, pistachios, and walnuts.
2. Citrus crops consist of grapefruit, oranges, lemons, and tangerines.
3. Fruit crops include apples, apricots, avocados, blueberries, cherries, grapes, raspberries, nectarines, olives, peaches, persimmons, plums, strawberries, and tomatoes.
4. Seed crops include cotton seed; alfalfa and wheat seed; and vegetable seed, including cabbage, carrots, lettuce, onion, and potatoes.
5. Field crops include of barely, beans, corn, hay, safflower, sugarcane, and wheat.
6. Vegetable crops include cantaloupe, carrots, corn, lettuce, peppers, onions, potatoes, and watermelons.

Sources: Kern County 1996¹⁵, 2014¹⁶**TABLE 7.6-6****AGRICULTURAL ACREAGE AND ACREAGE CHANGES IN KERN WATER BANK PARTICIPANTS' SERVICE AREA*, 1995–2015**

Crop Type	Acres		Net Change (1995–2015)	
	1995	2015	Acres	Percent
Nuts ¹	34,867	100,767	65,900	189.0
Citrus ²	7,321	24,763	17,442	238.2
Fruit ³	15,631	37,727	22,096	141.4
Field ⁴	98,961	11,070	-87,891	-88.8
Vegetable ⁵	15,717	4,500	-11,217	-71.4
Total	172,497	178,827	6,330	3.7

Notes:

* The Kern Water Bank participants' service area consists of lands served with KWB water: Dudley Ridge Water District in Kings County, and Semitropic Water Storage District, Westside Mutual Water Company, and Wheeler Ridge-Maricopa Water Storage District in Kern and Kings Counties.

1. Nut crops consist of almonds and pistachios.
2. Citrus crops consist of grapefruit, oranges, lemons, and tangerines.
3. Fruit crops include apples, apricots, grapes, bush berries, and tomatoes.
4. Field crops include alfalfa, beans, corn, cotton, and safflower.
5. Vegetable crops include asparagus, broccoli, cabbage, carrots, garlic, lettuce, melons, peppers, and onions.

Sources: Insight Environmental Consultants 2015¹⁷; data compiled by AECOM 2016.

As indicated by statewide data, there was also a material increase in orchard crops in areas of the KWB participants' service area that do not have access to KWB water..

Kern County Farmland Conversion

DOC estimated that Kern County had approximately 2,743,937 acres of agricultural land in 2012 (the most recent DOC farmland conversion data), of which approximately 900,332 acres were identified as Important Farmland and 1,843,605 acres were identified as Grazing Land.¹⁸

The USDA-NRCS soil surveys for all of Kern County were completed in 2004 and provide the most accurate baseline to assess conversion (using partial Kern County data prior to 2004 would exaggerate and misrepresent conversion acreages when compared to future years with 100% coverage of Kern County). Table 7.6-7 summarizes the DOC farmland conversion data, identifies the 2004 and 2012 acreages of agricultural land in Kern County, and shows the net change in acreage over the 8-year period.^{19,20} Overall, the total acreage of Important Farmland decreased by approximately 7.4 percent between 2004 and 2012, and the total acreage of Grazing Land increased by 2.9 percent over the 8-year period. In total, the acreage of agricultural land decreased by approximately 0.5 percent between 2004 and 2012 (Table 7.6-7).

Important Farmland Category	Acres		Net Change (2004–2012)	
	2004	2012	Acres	Percent
Prime Farmland	643,128	597,771	-45,357	-7.6
Farmland of Statewide Importance	214,705	212,867	-1,838	-0.9
Unique Farmland	109,318	89,694	-19,624	-21.9
Farmland of Local Importance ¹	–	–	–	–
Important Farmland Subtotal	967,151	900,332	-66,819	-7.4
Grazing Land	1,791,467	1,843,605	52,138	2.9
Agricultural Land Total	2,758,618	2,743,937	-14,681	-0.5

Note:
 1. The Kern County Board of Supervisors determined that no Farmland of Local Importance would be designated in Kern County.
 Sources: DOC 2006,²¹ 2012²²

DOC's 2012 Field Report for Kern County, which is the most recent DOC field report, identifies the factors contributing to changes in agricultural land uses during the DOC 2010–2012 farmland conversion update cycle. According to the 2012 Field Report, irrigated Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, or Unique Farmland) was converted to Urban and Built-Up Land from urban development in and adjacent to the city of Bakersfield and in the city of Shafter. Conversion of Important Farmland to Grazing Land occurred from irrigated land being converted to dryland production and confined livestock uses. Conversion of Important Farmland to Other Land resulted from delineation of low-density housing, farmsteads, and commercial uses. Other conversions of Important Farmland to Grazing Land and Other Land were a result of leaving formerly irrigated land idle for three or more update cycles.²³

Existing Agricultural Use on KWB Lands

The KWB HCP/NCCP permits certain uses for KWB Lands and designate general areas (referred to as "sectors") and acreages for those uses. The western portion of KWB Lands was designated by the KWB HCP/NCCP as the Farming Sector. This sector consists of 3,170 acres and was identified as an area where future farming of crops, such as grapes and cotton, could occur. With the exception of 45 acres

that was farmed intermittently prior to 2005 for the CDFG annual Heritage Game Bird hunt, no farming has occurred in the Farming Sector. Instead, this acreage, some of which has been used for recharge ponds, has developed into exceptional upland and wetland habitat.

Portions of KWB Lands that do not support KWBA facilities remain fallow. In 1996, KWBA implemented a sheep and cattle grazing program. The primary goal of the grazing program is to minimize tumbleweeds and manage excessive growth. As of 2014, only cattle are being grazed on KWB Lands.

Figure 7.6-1 shows the designated farmland on KWB Lands and in surrounding areas based on the most recent Kern County Important Farmland Map, published by DOC's Division of Land Resource Protection. Approximately 38 acres of the KWB Lands are designated as Prime Farmland, 13 acres are designated as Farmland of Statewide Importance, 15,390 acres are designated as Grazing Land, 11 acres are designated as Urban and Built-Up Land, and 5,035 acres are designated as Other Land. Non-KWB parcels north of Stockdale Highway, south of Taft Highway and Panama Lane, and east of Morris Road are designated as Important Farmland and these areas consist of active agricultural land uses.

7.6.2.3 Regulatory Setting between 1996 and 2014

Federal

No federal plans, policies, regulations, or laws related to agriculture and forestry resources apply to the KWB activities.

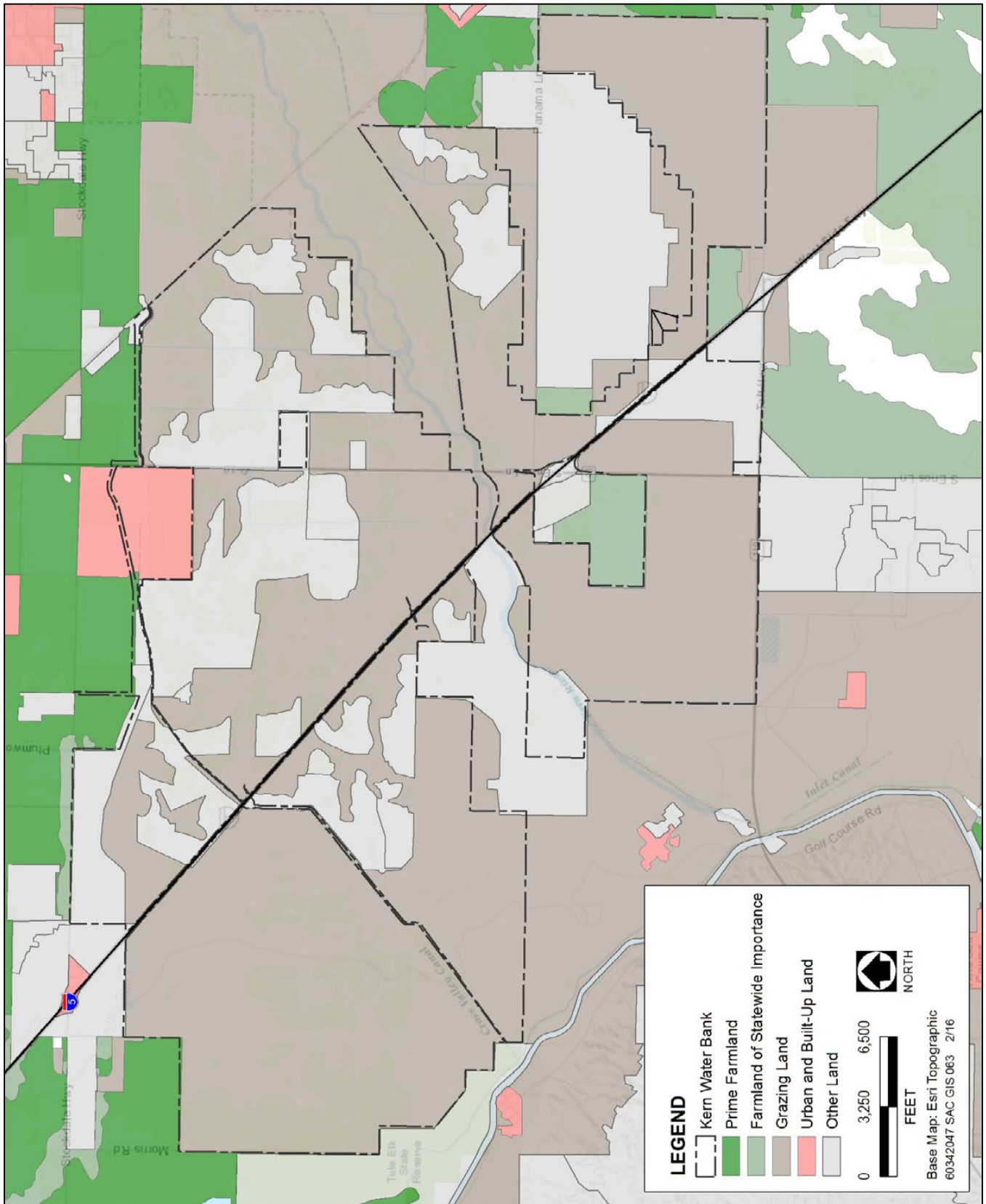
State

California Important Farmland Inventory System and Farmland Mitigation and Monitoring Program

The FMMP was established by the State of California in 1982 to continue the Important Farmland mapping efforts begun in 1975 by the United States Soil Conservation Service (now called the NRCS, under USDA). The intent of the United States Soil Conservation Service was to produce agricultural resource maps, based on soil quality and land use across the nation. DOC sponsors the FMMP and also is responsible for establishing agricultural easements, in accordance with PRC Sections 10250–10255.

The DOC FMMP maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. The following list provides a comprehensive description of all the categories mapped by DOC:²⁴

- **Prime Farmland**—Land that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.
- **Farmland of Statewide Importance**—Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture.
- **Unique Farmland**—Land of lesser quality soils used for the production of the state's leading agricultural cash crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California.
- **Farmland of Local Importance**—Land that is of importance to the local agricultural economy, as defined by each county's local advisory committee and adopted by its board of supervisors.
- **Grazing Land**—Land with existing vegetation that is suitable for grazing.
- **Urban and Built-Up Lands**—Land that is used for residential, industrial, commercial, institutional, and public utility structures and for other developed purposes.



Sources: DOC FMMP 2010

FIGURE 7.6-1. Important Farmland

- **Land Committed to Nonagricultural Use**—Land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands.
- **Other Lands**—Land that does not meet the criteria of any of the previously described categories and generally includes low-density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined-animal agriculture facilities, strip mines, borrow pits, and vacant and nonagricultural land surrounded on all sides by urban development.

State

California Important Farmland Inventory System and Farmland Mitigation and Monitoring Program

The FMMP was established by the State of California in 1982 to continue the Important Farmland mapping efforts begun in 1975 by the United States Soil Conservation Service (now called the NRCS, under USDA). The intent of the United States Soil Conservation Service was to produce agricultural resource maps, based on soil quality and land use across the nation. DOC sponsors the FMMP and also is responsible for establishing agricultural easements, in accordance with PRC Sections 10250–10255.

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- **Prime Farmland**—Land that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.
- **Farmland of Statewide Importance**—Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture.
- **Unique Farmland**—Land of lesser quality soils used for the production of the state’s leading agricultural cash crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California.
- **Farmland of Local Importance**—Land that is of importance to the local agricultural economy, as defined by each county’s local advisory committee and adopted by its board of supervisors.
- **Grazing Land**—Land with existing vegetation that is suitable for grazing.
- **Urban and Built-Up Lands**—Land that is used for residential, industrial, commercial, institutional, and public utility structures and for other developed purposes.
- **Land Committed to Nonagricultural Use**—Land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands.
- **Other Lands**—Land that does not meet the criteria of any of the previously described categories and generally includes low-density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined-animal agriculture facilities, strip mines, borrow pits, and vacant and nonagricultural land surrounded on all sides by urban development.

Important Farmland is classified by DOC as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are located adjacent to the KWB Lands.

Under CEQA, the designations for Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are defined as “agricultural land” or “farmland” (PRC Sections 21060.1 and 21095, and CEQA Guidelines Appendix G).

Regional and Local

Kern County General Plan

The *Kern County General Plan* states that agriculture is vital to the future of Kern County and sets the goals of protecting important agricultural lands for future use and preventing the conversion of prime agricultural lands to other uses (e.g., industrial or residential).²⁶

The following goal and policies related to agriculture and forestry resources from the Land Use, Conservation, and Open Space Element of the *Kern County General Plan* would be applicable to KWB activities.

Goal 5. Conserve prime agriculture lands from premature conversion.

- **Policy 7.** Areas designated for agricultural use, which include Class I and II and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential, commercial, and industrial subdivision and development activities.
- **Policy 10.** To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:
 - (a) Promote groundwater recharge activities in various zone districts;
 - (d) Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater and desalination.
- **Policy 12.** Areas identified by the Natural Resource Conservation Service (formerly Soil Conservation Service) as having high range-site value should be conserved for Extensive Agriculture uses or as Resource Reserve, if located within a County water district.

7.6.3 IMPACTS AND MITIGATION MEASURES

7.6-1 KWB activities could potentially convert agricultural uses, including Important Farmland, to nonagricultural uses or potentially convert irrigated farmland to orchards, which could cause other indirect effects.

1996 – 2014

Crops within Kern County generally occur on soils meeting the definition of Important Farmland. As shown in Table 7.6-7, the total acreage of Important Farmland decreased by approximately 7.4 percent between 2004 and 2012 in Kern County. According to the DOC’s Field Report, the majority of irrigated Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, or Unique Farmland) was converted to Urban and Built-Up Land from urban development in and adjacent to the city of Bakersfield and in the city of Shafter and conversion of Important Farmland to Other Land resulting from delineation of low-density housing, farmsteads, and commercial uses. Other conversions of Important Farmland to Grazing Land and Other Land were a result of leaving formerly irrigated land idle for three or more update cycles. As discussed above, as of 1995, no agricultural activities were carried out on KWB Lands.

KWB-recovered water is typically used locally by KWB participants. Four of the six KWB participants are agricultural districts/entities, while two are municipal and industrial (M&I) districts. See Section IV of Appendix E (Revised) for an accounting of KWB water. KWB participants did not construct new water conveyance facilities specifically or partially to convey KWB-recovered water; KWB participants already had facilities in place to convey and use recovered water. Most of the recovered water is used by KWB participants for agricultural purposes, except for a relatively small amount of water that goes to urban water contractors in the participants' service area (see Chapter 8, Growth-Inducing Impacts). Overall, KWB provides recovered water for agricultural uses at times when less water would be available without the KWB. Consequently, the KWB has helped maintain agricultural lands in agricultural production. No known conversion of agricultural land uses, including Important Farmland to nonagricultural uses, occurred.

As shown in Table 7.6-5, there was a relatively small increase in agricultural acreage in Kern County (approximately 1.2 percent) between 1996 and 2014, but the cropping patterns within the county changed substantially. The acreage of nut crops increased by approximately 206 percent and almonds accounted for more than 65 percent of the total nut crops in 2014. Combined acreages of seed crops, field crops, and vegetable crops all decreased during the same time period.

KWB activities increased water supply reliability, which has potentially resulted in changes from irrigated crops or annual field crops on land that could be fallowed in dry/critically dry years to permanent crops like orchards and vines that require a dedicated water supply. As evidenced by the KWB participants' service area analysis, changes in farming practices in the KWB participants' service area are consistent with the county-wide trend discussed above (Table 7.6-6) and with a state-wide trend even in areas that do not depend upon water banks for water storage.

KWB activities did not convert agricultural uses to nonagricultural uses on KWB Lands as agriculture ceased prior to the property transfer. Overall, KWB activities did not result in significant changes in the physical environment that could directly result in the conversion of agricultural land, including Important Farmland, to nonagricultural uses.

Therefore the impact of KWB activities between 1996 and 2014 on conversion of agricultural lands, including Important Farmland, to nonagricultural uses was ***less than significant***.

In addition, KWB recovered water would provide water supplies that resulted in a benefit by helping to maintain agricultural lands in agricultural production.

Mitigation Measures

None required.

2015 – 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program. Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. All planned KWB activities on KWB Lands are consistent with permitted uses of agricultural land.

KWB activities would increase the recharge capability of the KWB and the amount of water that could be provided during recovery. No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants already have facilities in place to convey and exchange recovered water. Conveyance of KWB-recovered water used beyond KWB

Lands is not anticipated to result in the conversion of agricultural land, including Important Farmland, to nonagricultural uses.

Like any groundwater bank, the KWB increases the reliability of water supplies to its participants. KWB participants use the recovered water primarily for agricultural uses. Based on the historical trend of converting irrigated crops with annual crops in Kern County and the KWB participant's service area, it is possible that KWB activities could result in additional land being converted to permanent crops. The trend of replacing irrigated annual crops with permanent crops is expected to continue in the future with or without the KWB.

KWB activities would not convert agricultural uses to nonagricultural uses on KWB Lands. Overall, KWB activities would not result in significant changes in the physical environment that could directly result in the conversion of agricultural land, including Important Farmland, to nonagricultural uses.

Therefore, the impact of KWB activities between 2015 and 2030 on conversion of agricultural lands, including Important Farmland, to nonagricultural uses would be ***less than significant***.

In addition, KWB recovered water would provide water supplies that is likely to result in a benefit by helping to maintain agricultural lands in agricultural production.

Mitigation Measures

None required.

ENDNOTES

1. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
2. Kern County Department of Agriculture. 1995. *Kern County Crop Report—1995*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
3. Kern County Department of Agriculture and Measurement Standards. 1995. *Kern County Crop Report—1995*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
4. Kern County Department of Agriculture and Measurement Standards. 2014. *2014 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
5. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
6. California Department of Conservation. 1998 (June). *Farmland Conversion Report, 1994 to 1996*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
7. California Department of Conservation. 1998 (June). *Farmland Conversion Report, 1994 to 1996*. Available online at <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
8. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
9. California Department of Conservation. 1998 (June). *Farmland Conversion Report, 1994 to 1996*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
10. California Department of Conservation. 1998 (June). *Farmland Conversion Report, 1994 to 1996*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
11. Kern County Department of Agriculture and Measurement Standards. 2014. *2014 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
12. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
13. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
14. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA. For the purpose of this analysis, the KWB service area consists of lands served with KWB water: Dudley Ridge Water District in Kings County, and Semitropic Water Storage District, Westside Mutual Water

Company, and Wheeler Ridge–Maricopa Water Storage District in Kern and Kings Counties. Because Improvement District No. 4 and Tejon-Castac Water District store water in the KWB exclusively or predominantly for nonagricultural purposes, they were not considered in this analysis.

15. Kern County Department of Agriculture and Measurement Standards. 1996. *1996 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
16. Kern County Department of Agriculture and Measurement Standards. 2014. *2014 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
17. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
18. California Department of Conservation. 2012. *Kern County Farmland 2010–2012 Conversion Report*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
19. California Department of Conservation. 2008. *California Farmland Conversion Report, 2004–2006 Conversion*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
20. California Department of Conservation. 2012. *Kern County Farmland 2010–2012 Conversion, 2004 to 2006*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
21. California Department of Conservation. 2006. *Kern County Farmland 2004–2006 Conversion Report*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
22. California Department of Conservation. 2008. *California Farmland Conversion Report, 2004 to 2006*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
23. California Department of Conservation. 2012. *2012 Kern County Field*. Farmland Mapping and Monitoring Program Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
24. California Department of Conservation. 2014 (April). *California Farmland Conversion Report 2008–2010*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
25. California Department of Conservation. 2014 (April). *California Farmland Conversion Report 2008–2010*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
26. Kern County Planning Department. 2009 (September 22). *Kern County General Plan, Land Use, Open Space, and Conservation Element*. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009.

7.7 AIR QUALITY (NEW)

7.7 AIR QUALITY (NEW)

7.7.1 INTRODUCTION

7.7.1.1 Contnet

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.7 identified potential impacts to air quality as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section that replaces text from DEIR Section 7.7 that discusses KWB activities. All other text in DEIR Section 7.7 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.7-1A identifies the potentially affected environmental resources from impacts of KWB activities on air quality.

TABLE 7.7-1A

IMPACTS OF KWB ACTIVITIES ON AIR QUALITY

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Air emissions with construction and operation of percolation ponds and other KWB facilities, and transfer of KWB Lands	7.7-1; 7.7-2; 7.7-3; 7.7-4; 7.7-5

No comment letters related to air quality were received in response to the Notice of Preparation for the Monterey Plus DEIR circulated for the proposed project.

7.7.1.2 Analytical Method

Air quality impacts related to criteria air pollutant emissions and toxic air contaminants were evaluated qualitatively and quantitatively. Factors considered in the analysis included KWB operations and maintenance from 1996 to 2014 and ongoing future activities (2015–2030). Construction emissions associated with planned KWB infrastructure were also evaluated as part of the analysis.

For construction and typical maintenance activities that would include on-road vehicles and off-road heavy-duty construction equipment, the San Joaquin Valley Air Pollution Control District (SJVAPCD)—approved model, CalEEMod Version 2013.2.2, was used to quantify air quality emissions.¹ When possible, the most current California Air Resources Board (CARB) on-road emission inventory model, EMFAC2014, was used to quantify on-road emissions. Kern Water Bank Authority (KWBA) provided historical and current information regarding KWB operations and maintenance and projected construction activities for future infrastructure.

The annual emissions associated with historical operations and maintenance and proposed construction were compared to SJVAPCD thresholds of significance to determine the significance of impacts related to increased emissions. All emissions associated with construction and operations and maintenance (O&M) activities are associated with SJVAPCD's jurisdiction. It is possible that some construction workers or KWBA employees could come from different jurisdictions; however, for the purpose of this analysis, all emissions were conservatively assumed to occur in the SJVAPCD.

7.7.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For purposes of this REIR, impacts on air quality would be considered significant if KWB activities would:

- Substantially conflict with or obstruct implementation of applicable air quality plans;
- violate any air quality standards or contribute substantially to an existing or projected air quality violation;
- cause cumulatively considerable net increases of any criteria pollutant for which an affected region is in non-attainment under applicable federal or state ambient air quality standards;
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

As stated in Appendix G, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. Based on SJVAPCD's *Guide for Assessing*

and *Mitigating Air Quality Impacts*,² implementation of KWB activities would result in a significant air quality impact if any of the following scenarios would occur:

Criteria Air Pollutants or Precursors

- Short-term construction-related emissions of reactive organic gases (ROG) or nitrogen oxides (NO_x) would exceed 10 tons per year (tpy).
- Short-term construction-related emissions of respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM₁₀) or fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less (PM_{2.5}) would exceed 15 tpy, or SJVAPCD-required control measures in compliance with Regulation VIII, “Fugitive Dust Prohibition”; or other applicable SJVAPCD-recommended mitigation measures were not incorporated into the proposed construction plans.
- Long-term operational emissions of ROG or NO_x would exceed 10 tpy.
- Long-term operational emissions of PM₁₀ or PM_{2.5} would exceed 15 tpy.
- Long-term operational (local) emissions would violate any air quality standard or contribute substantially to an existing or projected air quality violation, or would expose sensitive receptors to substantial pollutant concentrations. Such a violation would occur if carbon monoxide (CO) emissions would exceed the 20 parts per million (ppm) (1-hour) or 9 ppm (8-hour) standard.

Toxic Air Contaminants

- Construction or operational emissions would expose sensitive receptors to toxic air contaminant (TAC) emissions that would exceed a 10 in a million excess cancer risk or a hazard index of 1 for non-cancer risk at the maximally exposed individual.

7.7.2 ENVIRONMENTAL SETTING

7.7.2.1 Physical Setting in 1995

Kern County is located in the San Joaquin Valley Air Basin (SJVAB), bordered on the east by the Sierra Nevada, on the west by the Coast Ranges, and to the south by the Tehachapi Mountains. Airflow in the SJVAB is influenced by marine air that entered through the Carquinez Straits where the Sacramento-San Joaquin Delta empties into the San Francisco Bay. The region’s topographic features restrict air movement through and out of the basin.³ As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Frequent transport of pollutants into the SJVAB from upwind sources also contributes to poor air quality.

Wind speed and direction play an important role in dispersion and transport of air pollutants. During summer, winds usually originate from the north end of the San Joaquin Valley and flow in a south-southeasterly direction through the valley, through the Tehachapi Pass, and into the neighboring Southeast Desert Air Basin. During winter, winds occasionally originate from the south end of the valley and flow in a north-northwesterly direction. Also, during winter, the valley experiences light, variable winds, less than 10 miles per hour (mph). Low wind speeds, combined with low inversion layers in winter, create a climate conducive to high concentrations of certain air pollutants.⁴

The SJVAB has an inland Mediterranean climate that is characterized by warm, dry summers and cool winters. Summer high temperatures often exceed 100 degrees Fahrenheit (°F), averaging from the low 90s in the northern part of the valley to the high 90s in the south. The daily summer temperature variation can be as high as 30 degrees °F. Winters are for the most part mild and humid. Average high

temperatures during winter are in the 50s, while average daily low temperatures are about 45 degrees °F.⁵

The vertical dispersion of air pollutants in the valley is limited by the presence of persistent temperature inversions. Air temperatures usually decrease with an increase in altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Air above and below an inversion does not mix because of differences in air density thereby restricting air pollutant dispersal.⁶

This air basin is in non-attainment of federal and state standards for both PM₁₀ and ozone. The SJVAB also has areas where TACs are problematic. In 1995, the SJVAB was designated by the U.S. Environmental Protection Agency (EPA) as being in “serious” non-attainment for the federal one-hour ozone standard. No other federal ozone standard was in place at the time. This led to the preparation of the 1994 Ozone Attainment Plan, which was prepared by the local air agency and was adopted in 1994. The SJVAB was also in “serious” non-attainment of the federal PM₁₀ standard and developed a plan to bring the basin into attainment of the standard.

In 1995, the State as a whole experienced health impacts from TACs, mostly from diesel particulate matter. At that time, Kern County had several areas where the estimated inhalation cancer risk was greater than 250 per million people.

7.7.2.2 Changes in Physical Setting between 1996 and 2014

By 2003, the air basin’s attainment status had been changed to “severe” nonattainment for the federal ozone standard. The SJVAPCD was also readying to petition the EPA to reclassify the Basin to “extreme” for one-hour ozone standard to allow the Basin more time to attain the standard. The Basin remained a “serious” non-attainment area for the federal PM₁₀ standard. The Basin also remained a non-attainment area for State ozone and PM₁₀ standards. The SJVAPCD thresholds of significance in 2003 were 10 tons/year of ROG, 10 tons/year NO_x, and an excess cancer risk of 10 in one million from TACs. Risk from diesel particulate matter in the Basin had improved since 1995, but areas still existed where TAC risk was high. The current attainment status of the project region with respect to national and state standards is described below.

The SJVAPCD maintains a network of air quality monitoring stations located throughout the San Joaquin Valley. The monitoring stations record concentrations of various pollutants including: ozone; carbon monoxide; nitrogen dioxide (NO₂); sulfur dioxide (SO₂); PM₁₀; PM_{2.5}; lead (Pb); and sulfates (SO₄). Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. The station closest to and most representative of air quality conditions at the KWB Lands is in Shafter (ozone only). This monitoring site is approximately 10 miles northeast of KWB Lands. The nearest monitoring stations for PM₁₀ and PM_{2.5} are located in Bakersfield, approximately 15 miles east of KWB Lands. As PM is a localized pollutant, data from the highly urbanized Bakersfield station would not be representative of concentrations in the rural KWB area, but it provides current ambient air quality concentrations near KWB Lands. Table 7.7-2 presents the most recent three-year summary of air pollutant (concentration) data collected at the nearest monitoring stations. As shown in Table 7.7-2, these measured air pollutant concentrations are compared with state and national ambient air quality standards.

TABLE 7.7-2

AIR QUALITY DATA SUMMARY FOR BAKERSFIELD AND SHAFTER, 2010-2012

Pollutant	2011	2012	2013
Ozone –Shafter			
Highest 1 Hour Average (ppm) ^b	0.097	0.103	0.112
Days over State Standard (0.09 ppm) ^a	1	5	1
Highest 8 Hour Average (ppm) ^b	0.087	0.090	0.097
Days over National Standard (0.075 ppm) ^a	18	30	6
Days over State Standard (0.07 ppm) ^a	43	64	21
Particulate Matter (PM₁₀) –Bakersfield			
Highest 24 Hour Average – State/National (µg/m ³) ^{a, c}	154.0/97.4	125.8/99.6	116.9/120.7
Days (Measured) over National Standard (150µg/m ³) ^{a, c}	0	0	0
Days (Measured) over State Standard (50 µg/m ³) ^{a, c}	113	55	16
State Annual Average (State Standard 20 µg/m ³) ^{a, c}	44.2	41.4	*
Particulate Matter (PM_{2.5}) –Bakersfield			
Highest 24 Hour Average (µg/m ³) ^b – National Measurement	80.3	86.5	117.7
Days (Measured) over National Standard (35 µg/m ³) ^{a, c}	30	22	44
State Annual Average (12 µg/m ³) ^b	18.1	17.9	*
Notes:			
a Generally, state standards and national standards are not to be exceeded more than once per year.			
b ppm = parts per million; µg/m ³ = micrograms per cubic meter.			
c PM ₁₀ and PM _{2.5} are not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.			
* Insufficient data available to determine value; NA = Not Available.			
Values in Bold exceed the respective air quality standard.			
Source: California Air Resources Board, 2015.			

KWB Participants' Service Area

KWB activities may result in an indirect air quality impact as a result of providing more reliable water supply for KWB participants. A focused air quality analysis was prepared in 2015 to assess air quality impacts due to on-farm agricultural activities of the KWB participants' service area between 1995 and 2015.⁷ The analysis is based on emissions calculations methodologies and guidelines established or provided by the SJVAPCD and CARB. These methodologies provide crop-specific uncontrolled PM₁₀ emission factors on a per-acre basis. Table 7.7-3 presents the change in fugitive dust emissions from land preparation and harvesting and combustion emissions from diesel-fueled mobile equipment between 1995 and 2015.

As shown in Table 7.7-3, emissions of ROG, NO_x, CO, SO_x, PM₁₀, and PM_{2.5} decreased within the KWB participant's service area from 1995 to 2015. Fugitive PM₁₀ and PM_{2.5} emissions decreased due to land preparation and harvesting emissions decreased due to control measures required by SJVAPCD.⁸ Overall, the Focused Air Quality Analysis determined that ROG, NO_x, PM₁₀, and PM_{2.5} emissions associated with KWB-supplied agricultural activities would decrease by approximately 41%, 46%, 8%, and 12%, respectively, from 1995 to 2015.⁹ The ROG and NO_x reductions are a result of turnover in equipment fleets, introduction of new equipment, and increasingly stringent emissions standards. Emissions reductions for PM₁₀ and PM_{2.5} are a result of both changes in agricultural equipment mentioned above and SJVAPCD Rule 4550 (Conservation Management Practices), which limits fugitive dust emissions from agricultural operations. Exhaust-related PM₁₀ and PM_{2.5} emissions, which are primarily diesel particulate matter (diesel PM), decreased by approximately 34% from 1995 to 2015. The increase in harvest-related PM₁₀ emissions is primarily driven by the change from cotton to

almonds. Almond crops generate significantly more fugitive dust than cotton during harvesting activities than during land preparation.⁹ These indirect impacts of KWB activities are discussed in the Air Quality section of Section 10.1.5, Cumulative Impacts.

1995 (tons)						
Emission Sources	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Agricultural Land Preparation	--	--	--	--	541.8	120.3
Agricultural Harvest Operations	--	--	--	--	529.2	117.5
Agricultural Equipment	186.9	1,235.3	559.7	0.7	70.7	65.1
Total Emissions	186.9	1,235.3	559.7	0.7	1,141.7	302.9
2015						
Emission Sources	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Agricultural Land Preparation	--	--	--	--	173.7	38.6
Agricultural Harvest Operations	--	--	--	--	834.9	185.3
Agricultural Equipment	109.4	65.1	396.4	0.1	46.4	42.7
Total Emissions	109.4	665.1	396.4	0.1	1,055.0	266.6
Notes: CO = carbon monoxide; NO _x = nitrogen oxides; PM ₁₀ = respirable particulate matter with an aerodynamic resistance diameter less than 10 micrometers; PM _{2.5} = fine particulate matter with an aerodynamic resistance diameter less than 2.5 micrometers; ROG = reactive organic gases; SO _x = sulfur oxides.						
Source: Insight Environmental Consultants. 2015 (October).						

7.7.2.3 Regulatory Setting in 1995

Regulations related to air quality relevant to KWB activities are relatively unchanged between 1995 and the 1996 through 2014 period and are discussed below.

7.7.2.4 Changes in Regulatory Setting between 1996 – 2014

Federal

EPA is the federal agency responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives.

As part of its enforcement responsibilities, EPA requires each state with non-attainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs. With respect to the National Ambient Air Quality Standards, the air basin is designated as nonattainment for ozone and PM_{2.5}, and attainment or unclassified for the remaining pollutants (i.e., NO₂, PM₁₀, CO, SO₂, and lead).

State

CARB, a part of the California Environmental Protection Agency (Cal EPA), is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, CARB conducts research, sets State ambient air quality standards, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products, and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. The CARB also has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts. With respect to the California Ambient Air Quality Standards, the air basin is currently designated as nonattainment for ozone, PM₁₀, and PM_{2.5}, and attainment or unclassified for the remaining pollutants (i.e., NO₂, CO, SO₂, and lead). California also includes ambient air quality standards for sulfates, hydrogen sulfide, visibility reducing particles, and vinyl chloride, all for which the project area is also designated as attainment or unclassified.

Regional

Air Quality Districts

Numerous local agencies throughout California have jurisdiction over local air quality control. The agencies' boundaries normally follow political boundaries. These local agencies, called "air quality management districts" or "air pollution control districts," are responsible for permitting many sources of air emissions and developing rules to regulate activities and operations that contribute to the degradation of air quality. Because they are regularly commenting agencies or responsible agencies, many districts also have produced guidance to help project applicants comply with CEQA. These guidance documents normally contain thresholds of significance for criteria pollutants. Thresholds of significance can vary significantly between agencies, but most thresholds are correlated to an air district's attainment plans for the criteria pollutants. Projects that have the potential to generate criteria pollutants in excess of local thresholds are considered significant.

San Joaquin Valley Air Pollution Control District

The western portion of Kern County (including the KWB Lands), which is in the SJVAB, is regulated by the SJVAPCD. The SJVAPCD sets thresholds of significance for emissions from construction and operational activities for projects. For construction activities, the SJVAPCD specifies that thresholds would not normally be exceeded as long as a project is complying with specific PM₁₀ control measures (SJVAPCD Regulation VIII). In 2015, SJVAPCD updated the *Guide for Assessing and Mitigating Air Quality Impacts* (2015 GAMAQI) with thresholds of significance for construction and operational emissions occurring within its jurisdiction. For construction-related emissions, SJVAPCD also established thresholds of significance for PM₁₀ and PM_{2.5} emissions, for which the region is nonattainment with respect to the California ambient air quality standards. For operational activities, the SJVAPCD specifies a threshold of 10 tpy of ROG, 10 tpy of NO_x, 15 tpy of PM₁₀, 15 tpy of PM_{2.5}, and a cancer risk from TACs of greater than 10 in one million. This analysis uses these thresholds from the 2015 GAMAQI to evaluate the KWB's construction and operational emissions.

The SJVAPCD also regulates burn permits and rules for open agricultural burning (Rule 4103)¹⁰ and prescribed burning and hazard reduction burning (Rule 4106).¹¹ The SJVAPCD does not set the burn season, but only provides permitting. KWB Lands are located within Cal Fire Local Responsibility Area (LRA)(see Section 7.0.4.1.3).¹² The Kern County Fire Department is the LRA and sets the burn season (see Section 7.0.4.1.4).

Eastern Kern Air Pollution Control District

Air quality in the eastern portion of Kern County is regulated by the Eastern Kern Air Pollution Control District (EKAPCD). Similar to SJVAPCD, the EKAPCD seeks to improve air quality conditions in the Kern County portion of the MDAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. In 1999, the EKAPCD updated their previously adopted Guidelines for Implementation of California Environmental Quality Act (1999 CEQA Guidelines).¹³ It is not anticipated that any of the direct construction or O&M activities associated with KWB activities would occur in EKAPCD's jurisdiction, but potential employee trips for construction or O&M could come from EKAPCD's jurisdiction. It should be noted that EKAPCD has adopted similar thresholds of significance as SVAPCD and therefore by including all emissions in a single jurisdiction (i.e., SJVAPCD), this analysis conservatively estimates the project's air quality emissions.

General Plans

The Kern County General Plans contains goals and policies to address air quality and pollutant emissions. Based on the impact analyses presented below, there are no aspects of the KWB activities that would be considered inconsistent with general plan policies pertaining to air quality.

7.7.3 IMPACTS AND MITIGATION MEASURES

7.7-1 Construction of KWB facilities could potentially generate emissions that would violate air quality standards or conflict with or obstruct implementation of the SJVAPCD air quality plan.

1996 — 2014

The KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter pipelines (> 36-inch-diameter). Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct.

Construction of the recharge ponds, canal, and other facilities required the use of heavy-duty construction equipment. This equipment generated diesel particulate matter, which is a TAC, as well as emissions of ozone precursors such as ROG and NO_x. The disturbance of the soil associated with the various earthmoving activities also generated PM₁₀. Because KWBA would have been required to implement all of the SJVAPCD's suggested PM₁₀ control measures, PM₁₀ construction emissions would likely have been below SJVAPCD thresholds (see Section 7.0.4.1.3, Air Quality Standards). Based on a

conservative assumption of 800 acres per year of soil disturbance to construct the ponds, NO_x and ROG emissions would not have exceeded SJVAPCD thresholds. Further, the duration of construction-generated air pollutant emissions was temporary and limited to the construction periods only.

Thus, KWB construction activities in 1996—2014 did not generate annual emissions exceeding SJVAPCD thresholds of significance and would not result in a net increase in criteria air pollutants in a non-attainment area that would conflict with implementation of the adopted air quality plan for the region.

Therefore, the impact of KWB activities from 1996 to 2014 for construction of KWB facilities with regard to generating air pollutant emissions was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with the KWB Habitat Conservation Plan/Natural Communities Conservation Plan (KWB HCP/NCCP) requirements; final locations and areas will be determined as these facilities are designed. KWBA has also issued a Notice of Preparation in 2012 for the proposed Kern Water Bank Conservation and Storage Project, which would use existing facilities to divert water from the Kern River to increase reliability and enhance the dry-year water supply of KWBA's participants through storage in the KWB. No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants already have facilities in place to convey and exchange recovered water.

As described above in Section 7.7.1.2, Analytical Method, construction emissions associated with future KWB activities were modeled using the SJVAPCD-approved CalEEMod and project-specific information provided by KWBA. Where project-specific information was not available, default assumptions contained in CalEEMod were used to model emissions. It should be noted that default CalEEMod assumptions are conservative to avoid underestimating construction emissions when project-specific information is not known.

The future IRWM program includes the construction of three wells and approximately 190 acres of recharge ponds that would be consistent with the KWB HCP/NCCP. To allow for a conservative analysis, all construction activities were assumed to occur in year 2016, the earliest possible year of construction. Emission rates in later years would be lower because of vehicle and equipment fleet turnover and improvements to emissions technology. Therefore, year 2016 emission rates are the maximum emission rates for construction activities. Table 7.7-4 presents the annual construction emissions associated with the future IRWM program.

The full build-out of the KWB includes the construction of approximately 862 acres of recharge ponds that would be consistent with the KWB HCP/NCCP. Similar to the IRWM program, all construction activities were assumed to occur in 2016 to allow for a conservative analysis. At the time of this analysis, project-specific information for the full build-out was not available. Therefore, project-specific

information was extrapolated using the recharge pond construction information for the IRWM program. Table 7.7-4 presents the annual construction emissions associated with the full build-out.

Construction Project	Pollutants (tons)			
	ROG	NO _x	PM ₁₀	PM _{2.5}
Integrated Resources Water Management Program ¹	0.26	2.87	0.16	0.13
Full KWB build-out ¹	0.51	6.11	0.33	0.25
Total Emissions²	0.76	8.98	0.48	0.38
SJVAPCD Thresholds (tpy)	10	10	15	15
Exceeds Thresholds? ²	No	No	No	No

Notes:
 NO_x = nitrogen oxides; PM₁₀ = respirable particulate matter with an aerodynamic resistance diameter less than 10 micrometers; PM_{2.5} = fine particulate matter with an aerodynamic resistance diameter less than 2.5 micrometers; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District; tpy = tons per year.

¹ Both the Integrated Resources Water Management Program and KWB Conservation and Storage projects plus full build-out were conservatively modeled assuming that all construction activities would occur in year 2016, the earliest year that construction activities could occur for both projects. Year 2016 would result in the maximum emission factors for construction equipment and vehicles.

² The sum of emissions associated with both proposed projects and full KWB build-out was compared with SJVAPCD thresholds of significance. Although the IRWM program and full KWB build-out are not likely to completely overlap in the same year, this analysis conservatively assumes this worst-case scenario to determine significance.

Source: Data compiled by AECOM in 2015

As shown in Table 7.7-4, construction emissions associated with the future KWB activities would not generate levels of PM₁₀, ROG, or NO_x in excess of SJVAPCD thresholds for these pollutants (see Section 7.0.4.1.3, Air Quality Standards). Therefore, the KWBA's proposed 2015–2030 construction activities are not anticipated to generate annual emissions exceeding SJVAPCD thresholds of significance and would not result in a net increase in criteria air pollutants in a non-attainment area that could conflict with implementation of the adopted air quality plan for the region. In addition, KWBA would still need to comply with all applicable SJVAPCD rules and regulations, including Regulation VIII (Fugitive Dust Prohibition, Rule 8011 (fugitive dust control measures) and Rule 9510 (indirect source review) regardless of the level of emissions. See Section 7.0.4.1.3, Air Quality Standards for additional detail. No additional mitigation measures would be required.

Therefore, the impact of KWB activities from 2015 to 2030 for construction of KWB facilities with regard to generating air pollutant emissions would be ***less than significant***.

Mitigation Measures

None required.

7.7-2 Operations and maintenance of existing and proposed KWB facilities could potentially generate air pollutant emissions that would violate air quality standards or conflict with or obstruct implementation of the SJVAPCD air quality plan.

1996 — 2014

From 1996 to 2014, KWB activities included various O&M activities that would generate air pollutant emissions. O&M activities include the use of heavy-duty construction equipment for earthmoving and infrastructure-related maintenance. On-road vehicles such as pick-up trucks and heavy-duty haul trucks are used by workers to inspect facilities and transport materials, respectively. In addition, O&M

activities include prescribed burns, whose air pollutant emissions are permitted by the SJVAPCD and therefore are not included in this analysis (see Impact 7.7-12 for impacts from burning). Greenhouse gas (GHG) emissions associated with prescribed burns are evaluated further in Chapter 12, Climate Change. Grazing of the KWB Lands by sheep and cattle does not generate emissions of air pollutants but does generate GHG emissions (see Chapter 12, Climate Change). Lastly, electricity is used to operate the KWB's conveyance, recharge, and recovery facilities. While electric pump use would have increased, this would not have increased air emissions in the KWB area, as electric pumps are not sources of direct air quality emissions. Air quality emissions from electricity generation would be evaluated and regulated as part of the power plants' permitting process and therefore are not evaluated in this analysis.

Table 7.7-5 presents the total and annual average air pollutant emissions associated with O&M activities for KWB activities for 1995-2014. As shown in Table 7.7-5, the total and annual average emissions associated with O&M activities from 1996 to 2014 did not exceed the SJVAPCD thresholds of significance and would not result in a net increase in criteria air pollutants in a non-attainment area that could conflict with implementation of the adopted air quality plan for the region (see Section 7.0.4.1.3, Air Quality Standards). However, KWBA would still need to comply with all applicable SJVAPCD rules and regulations, including but not limited to, Regulation VIII (Fugitive Dust Prohibition, Rule 8011 (fugitive dust control measures) during O&M activities that involve ground disturbance. Thus, it is not anticipated that 2015–2030 O&M activities associated with the KWB would generate annual emissions exceeding SJVAPCD thresholds of significance and would not result in a net increase in criteria air pollutants in a non-attainment area that could conflict with implementation of the adopted air quality plan for the region.

Operations and Maintenance Activity	Pollutants (tons)			
	ROG	NO _x	PM ₁₀	PM _{2.5}
On- and Off-Road Sources	0.85	3.32	0.40	0.34
Electricity Consumption ¹	—	—	—	—
Burns ²	—	—	—	—
Grazing ³	—	—	—	—
Total Emissions	0.85	3.32	0.40	0.34
Annual Average Emissions (tpy) ⁴	0.04	0.17	0.02	0.02
SJVAPCD Thresholds (tpy)	10	10	15	15
Exceeds Thresholds?	No	No	No	No

Notes:
 NO_x = nitrogen oxides; PM₁₀ = respirable particulate matter with an aerodynamic resistance diameter less than 10 micrometers; PM_{2.5} = fine particulate matter with an aerodynamic resistance diameter less than 2.5 micrometers; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District; tpy = tons per year.

¹ Electricity-related air pollutant emissions would be evaluated and controlled as part of the power plants' permitting process. These emissions are not evaluated again in this analysis. Greenhouse gas (GHG) emissions are evaluated further in Chapter 12, "Climate Change."

² Burn-related air pollutant emissions would be evaluated through SJVAPCD's permitting and fee process and therefore are not evaluated again in this analysis. See Impact 7.7-12 on odors. GHG emissions are evaluated further in Chapter 12, "Climate Change."

³ Grazing generates GHG emissions from enteric fermentation and manure management, which are evaluated further in Chapter 12, "Climate Change."

⁴ Annual average emissions from 1996 to 2014 were used to determine impact significance. As shown above, even the total operations and maintenance emissions from 1996 to 2014 would not exceed the significance thresholds.

Source: Data compiled by AECOM in 2015

Therefore, the impact of KWB activities from 1995 to 2014 with regard to operations and maintenance of existing KWB facilities with regard to generating air pollutant emissions was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

The future O&M activities associated with the KWB are anticipated to be similar to those shown in Table 7.7-4. Even with the addition of proposed future KWB activities, O&M activities are not anticipated to increase substantially beyond the previous O&M levels. Furthermore, it is highly unlikely that any increase in O&M activities would cause the annual average O&M emissions shown in Table 7.7-4 to exceed SJVAPCD thresholds of significance (see Section 7.0.4.1.3, Air Quality Standards). In addition, it is anticipated that over time, turnover in the vehicle and equipment fleet and improvements to emissions technology would cause vehicle and equipment emission rates to decrease. Thus, it is not anticipated that 2015–2030 O&M activities associated with the KWB would generate annual emissions exceeding SJVAPCD thresholds of significance and would not result in a net increase in criteria air pollutants in a non-attainment area that could conflict with implementation of the adopted air quality plan for the region.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to operations and maintenance of existing and proposed KWB facilities with regard to generating air pollutant emissions would be ***less than significant***.

Mitigation Measures

None required.

7.7-3 Construction, operations, and maintenance of existing and proposed KWB facilities could potentially generate cumulatively considerable air pollutant emissions.

As discussed in Impacts 7.7-1 and 7.7-2, the KWB's construction-related and operational activities would not result in emissions of any air pollutants exceeding SJVAPCD thresholds of significance. The SJVAB is designated as nonattainment for the state ozone, PM₁₀, and PM_{2.5} standards. Although most projects would result in a net increase in air pollutant emissions, this impact evaluates whether that net increase in air quality emissions would be considered a cumulatively considerable contribution to a significant cumulative impact on air quality. According to SJVAPCD, projects that would generate air pollutant emissions exceeding applicable thresholds of significance would generate emissions above the allowable limit for the region to attain and maintain ambient air quality standards, and the contribution of such emissions would be cumulatively considerable.¹⁴

1996 — 2014

KWB construction emissions from 1996 through 2014 did not exceed SJVAPCD thresholds of significance. Therefore, the KWB's construction-related emissions during 1996–2014 did not result in a cumulatively considerable net increase in emissions.

As shown in Table 7.7-4, O&M activities associated with KWB activities during 1996–2014 did not exceed the SJVAPCD thresholds of significance. Thus, the KWB O&M emissions during 1996–2014 did not result in a cumulatively considerable net increase in emissions.

Therefore, KWB activities from 1996 to 2014 did not result in a cumulatively considerable incremental contribution to a significant cumulative impact on air quality. This cumulative impact was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

As shown in Table 7.7-2, construction emissions from proposed future KWB activities would not exceed SJVAPCD thresholds of significance. Thus, the KWB's construction-related emissions during 2015–2030 would not result in a cumulatively considerable net increase in emissions.

As shown in Table 7.7-4, O&M activities associated with proposed future KWB activities during 1996–2014 did not exceed the SJVAPCD thresholds of significance. It is not anticipated that the 2015–2030 KWB O&M activities would substantially increase beyond the levels shown in Table 7.7-4. Thus, the KWB's O&M emissions during 2015–2030 would not result in a cumulatively considerable net increase in emissions.

Therefore, KWB activities from 2015 to 2030 are not likely to result in a cumulatively considerable incremental contribution to a significant cumulative impact on air quality. This cumulative impact would be ***less than significant***.

Mitigation Measures

None required.

7.7-4 Construction, operations, and maintenance of existing and proposed KWB facilities could potentially expose sensitive receptors to substantial pollutant concentrations.

KWB construction and operational activities would generate varying levels of TAC emissions that could expose sensitive receptors such as hospitals, day-care centers, schools, and residential areas. Potential construction and operational TAC emissions are discussed separately below.

1996 — 2014Construction

No sensitive receptors such as hospitals, day-care centers, schools, or residential areas were located within 1,000 feet of KWB Lands, such that they would have been affected. Furthermore, during 1996–2014, construction of KWB facilities was not known to expose sensitive receptors to substantial pollutant concentrations.

Operations and Maintenance

The KWB O&M activities during 1996–2014 occurred intermittently throughout the year and were distributed throughout KWB Lands. Therefore, considering the lack of sensitive receptors within 1,000 feet of KWB Lands, the relatively low intensity of O&M activities, the intermittent occurrence of O&M activities, and the fact that O&M activities were spread out across KWB Lands much farther away than 1,000 feet from sensitive receptors, O&M activities were not expected to have exposed sensitive receptors to substantial pollutant concentrations through TAC emissions or substantial contributions to potential CO hotspots (i.e., exceedance of CO ambient air quality standard).

Therefore, the impact of KWB construction and O&M activities from 1996 to 2014 with regard to potential exposure of sensitive receptors to substantial pollutant concentrations was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Construction

Construction activities would generate short-term emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment for earth-disturbing activities and diesel-fueled truck trips. Diesel PM was identified as a TAC by CARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts.¹⁵

Emissions from construction equipment throughout the United States will be reduced over time because a final rule promulgated by EPA in January 2001 reduces permitted emissions levels for heavy-duty diesel engines during 2007 and subsequent model years. These revised emissions standards were established to reduce NO_x emissions by 90%, non-methane hydrocarbon emissions by 72%, and PM emissions by 90% compared to the emissions standards for the 2004 model year. In December 2004, CARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to the standards finalized by EPA on May 11, 2004. Thus, since 2011, engine manufacturers have been required to meet after-treatment-based exhaust standards for NO_x and PM that are more than 90% lower than previous levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines. With the ongoing turnover and retrofitting of construction equipment, construction-related emissions of diesel PM would continue to decrease over time.

With respect to health impacts, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). The dose is determined based on the concentration of the substances in the environment and the length of time the receptor was exposed to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time.

According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period. Such assessments, however, should be limited to the period and duration of activities associated with the project being analyzed.

Construction activities for future KWB activities are anticipated to occur for approximately 6–8 months, or approximately 2% of the minimum exposure period required to complete a health risk assessment. The locations of future KWB activities, although preliminary in some cases, would not occur within 1,000 feet of sensitive receptors. Considering the intermittent and temporary construction emissions and the buffer distance from sensitive receptors, it is highly unlikely that KWB construction activities would expose sensitive receptors to substantial TAC concentrations. Therefore, future 2015–2030 construction-related TAC emissions would not expose sensitive receptors to substantial pollutant concentrations.

Furthermore, considering that construction activities would be intermittent and relatively low in intensity, and the relatively low population density near KWB Lands, it is highly unlikely that construction-related vehicle trips would contribute substantially to a potential CO hotspot.

Operations and Maintenance

As discussed in Impact 7.7-9, even with construction of future KWB infrastructure, it is not anticipated that the KWB's O&M activities from 2015 to 2030 would substantially increase beyond existing levels. Such activities would continue to occur intermittently across KWB Lands and would be of relatively low-intensity with respect to TAC emissions. Therefore, it is not anticipated that future KWB O&M activities would expose sensitive receptors, which are all located substantially greater than 1,000 feet away from KWB Lands, to substantial pollutant concentrations. Similar to construction-related activities, considering the relatively low intensity of O&M vehicle-related activities and the low population density near KWB Lands, it is highly unlikely that O&M activities would contribute substantially to a potential CO hotspot.

Therefore, the impact of KWB construction and O&M activities from 2015 to 2030 with regard to potential exposure of sensitive receptors to substantial pollutant concentrations would be ***less than significant***.

Mitigation Measures

None required.

7.7-5 Construction, operations, and maintenance of the existing and proposed KWB facilities could potentially generate objectionable odors affecting a substantial number of people.

The occurrence and severity of odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and causing citizens to submit complaints to local governments and regulatory agencies. Projects with the potential to frequently expose individuals to objectionable odors may have a significant adverse environmental impact. Typical facilities that generate odors include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food processing facilities. KWB activities include recharge and recovery water infrastructure facilities and O&M activities, which are not typically considered odor sources. Although construction activities are short-term and temporary, diesel-fueled construction equipment and heavy-duty trucks have the potential to expose nearby residents to objectionable odors. In addition, burning activities designed to reduce unwanted vegetation can also result in objectionable odors.

1996 — 2014

Construction and O&M using Diesel Fuel Equipment and Vehicles

Heavy-duty trucks and off-road construction equipment used during construction and maintenance activities would generate diesel PM exhaust, the odor of which could be considered offensive to some individuals. Given the lack of sensitive receptors on or near KWB Lands, the construction of KWB facilities would not expose a substantial number of receptors to objectionable odors. Therefore, construction of KWB facilities did not expose a substantial number of receptors to objectionable odor emissions.

Other O&M Activities

Emissions associated with grazing could have generated odorous emissions affecting a substantial number of receptors. Because sheep and cattle are allowed to move around specific areas when

grazing, manure from livestock is not consolidated in a single location which can cause a potential odor source. Rather, manure is naturally distributed throughout the grazing area, open to sunlight and air circulation to dry out manure, hence minimizing odor emissions.

Based on the magnitude of some burns, it is possible that some burns caused odor emissions beyond KWB Lands and immediately adjacent areas that could expose receptors to odorous emissions during the prescribed burns. With respect to burns, however, burns can only take place when approved by the SJVAPCD which regulates burns throughout its jurisdiction to ensure that burns do not affect overall air quality. Rules related to SJVAPCD's permitting, regulatory, and coordination requirements for open agricultural burning (Rule 4103)¹⁶ and prescribed burning and hazard reduction burning (Rule 4106)¹⁷ would minimize impacts on the public (see 7.0.4.1.4, Burning Permits).

Therefore, the impact of KWB construction and O&M activities for 1996 to 2014 with regard to objectionable odors was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Construction and O&M using Diesel Fuel Equipment and Vehicles

Construction activities associated with future KWB activities would occur intermittently throughout their 6- to 8-month construction schedules. However, construction-related odor emissions would occur during the day and cease at night. Therefore, construction-related odors would not be constantly generated from the construction site. In addition, construction equipment would be used intermittently, and thus would not constantly generate emissions. Furthermore, it is anticipated that these planned projects would occur more than 1,000 feet from existing sensitive receptors. Given the intermittent nature of construction activities and the buffer distance, it is unlikely that project construction activities would expose a substantial number of receptors to odorous emissions.

Other O&M

Grazing activities would be similar to those described for 1996–2014 and would not be anticipated to generate substantial odor emissions. SJVAPCD would continue to regulate burns (i.e. enforcement and administering Rules 4103 and 4106) throughout its jurisdiction to ensure that burns do not affect overall air quality. KWB's O&M activities would be required to obtain permits from SJVAPCD for burns and comply with all applicable requirements, which would minimize potential odor impacts to surrounding receptors (see 7.0.4.1.4 Burn Permits).

Therefore, the impact of KWB construction and all O&M activities from 2015 to 2030 with regard to objectionable odors would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. California Air Pollution Control Officers Association. 2016. CalEEMod. Available: <http://www.caleemod.com>. Accessed January 5, 2016.
2. San Joaquin Valley Air Pollution Control District. 2015 (March). *Guidance for Assessing and Mitigating Air Quality Impacts*. Available: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed January 4, 2016.
3. San Joaquin Valley Air Pollution Control District. 2002. *Guide for Assessing and Mitigating Air Quality Impacts*.
4. Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). *Stockdale Integrated Banking Project Draft Environmental Impact Report* (SCH # 2013091076). Available: <http://www.rrbwsd.com/wp-content/uploads/2015/04/2015-04-Stockdale-DEIR-optimized.pdf>.
5. Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). *Stockdale Integrated Banking Project Draft Environmental Impact Report* (SCH # 2013091076). Available: <http://www.rrbwsd.com/wp-content/uploads/2015/04/2015-04-Stockdale-DEIR-optimized.pdf>.
6. Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). *Stockdale Integrated Banking Project Draft Environmental Impact Report* (SCH # 2013091076). Available: <http://www.rrbwsd.com/wp-content/uploads/2015/04/2015-04-Stockdale-DEIR-optimized.pdf>.
7. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
8. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
9. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
10. San Joaquin Valley Air Pollution Control District. 2010 (April). Rule 4013. Open Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.
11. San Joaquin Valley Air Pollution Control District. 2001. Rule 4106. Prescribed Burning and Hazard Reduction Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.
12. California Department of Forestry and Fire Protection. 2012 (August). State Responsibility Areas for Fire Protection: Kern County. Available: http://frap.fire.ca.gov/data/frapgismaps/sra11_2/sramap.15.pdf. Accessed April 8, 2016.
13. Eastern Kern Air Pollution Control District. 1999. Guidelines for Implementation of CEQA. Available: http://www.kernair.org/Documents/CEQA/CEQA_Guidelines%20&%20Charts.pdf. Accessed January 20, 2016.

14. San Joaquin Valley Air Pollution Control District. 2015 (March). *Guidance for Assessing and Mitigating Air Quality Impacts*. Available: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed December 27, 2015.
15. California Air Resources Board. 2003. HARP User Guide, Appendix K. Available: <http://www.arb.ca.gov/toxics/harp/docs/userguide/appendixk.pdf>. Accessed January 7, 2016.
16. San Joaquin Valley Air Pollution Control District. 2010 (April). Rule 4013. Open Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.
17. San Joaquin Valley Air Pollution Control District. 2001. Rule 4106. Prescribed Burning and Hazard Reduction Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.

7.8 GEOLOGY, SOILS, AND MINERAL RESOURCES (NEW)

7.8 GEOLOGY, SOILS, AND MINERAL RESOURCES (NEW)

7.8.1 INTRODUCTION

7.8.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, the Monterey Plus EIR fully disclosed all impacts caused by the transfer of the KFE property. Consequently, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.8 identified potential impacts to geology, soils, and mineral resources as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.8 that discusses KWB activities. All other text in DEIR Section 7.8 remains unchanged.

Table 7.8-1A identifies the potentially affected environmental resources from impacts of KWB activities on geology, soils, and mineral resources.

TABLE 7.8-1A**IMPACTS OF KWB ACTIVITIES ON GEOLOGY, SOILS, AND MINERAL RESOURCES**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Changes in soil erosion with changes in agricultural practices and construction activities, exposure of people and structures to risks from construction in unstable soils (liquefaction), potential for land subsidence from KWB operation, and contribution of subsidence from KWB operation to movement on regional faults	7.8-1, 7.8-2, 7.8-3

No comment letters related to geology, soils, or mineral resource impacts were received in response to the Notice of Preparation circulated for the Monterey Plus EIR.

7.8.1.2 Analytical Method

The analysis of potential geologic and soils impacts throughout the KWB Lands was based on *Geology of California*, Second Edition, by Robert M. Norris and Robert W. Webb, information from the Natural Resources Conservation Service (formerly the U.S. Soil Conservation Service), and a large variety of publicly available technical reports and maps. The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects, based on the standards of significance presented in this section. In determining the level of significance, the analysis assumes that the KWB activities would comply with relevant federal, State, and local regulations governing seismic safety, and hazards associated with unstable soils.

The analysis included a review of the environmental setting, impacts, and mitigation measures related to geology, soils, and mineral resources, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.8.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this REIR, a significant impact related to geology and soils would occur if the KWB activities would:

- result in substantial soil erosion or the loss of topsoil; or
- be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in substantial on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

KWB Lands contain known subsurface deposits of oil and natural gas. However, KWB activities would not interfere with the ability of any mine operator's rights to extract such resources or have any impact on mineral resources. Thus, there would be no impact related to loss of availability of known mineral resources, and therefore mineral resources were not addressed in the Monterey Plus EIR and are not addressed further in this REIR.

7.8.2 ENVIRONMENTAL SETTING

7.8.2.1 Physical Setting in 1995

The San Joaquin Valley basin is bordered to the south and east by the Sierra Nevada and Tehachapi mountains, which are composed of crystalline igneous and metamorphic rock. Exposed consolidated marine sedimentary rock from the Coast Range is evident in the layer of sediment above bedrock underlying the San Joaquin basin. The property underlying KWB Lands is a large, deep, and asymmetrical sedimentary basin located in the southern portion of the San Joaquin Valley.

The marine sedimentary rock is overlain by a thick series of continental rocks and semi-consolidated to unconsolidated sediments. These sediments are several thousand feet thick under KWB Lands and encapsulate the primary groundwater basin. The portion of this sediment that is usable for groundwater storage is located above the base of the fresh water in the basin. This area of the groundwater basin is dominated by the alluvial fan and lake material that comprise KWB Lands. Further, groundwater development is limited to the upper portions of the fresh water aquifer system in this basin.

The southern San Joaquin Valley, including KWB Lands, is dominated by the alluvial fan deposited by the Kern River, and consists of thick deposits of sand and gravel with extensive but discontinuous silt and clay beds.¹ The sand and gravel deposits are remnants of old streambed channels which generally occur in long, winding, and interconnecting stingers and sheets that are prevalent throughout the KWB Lands, but less evident along its borders. These sand and gravel deposits are highly permeable, but are imbedded with less permeable areas comprised of fine-grained silt and clay deposits. These silt and clay deposits are more extensive along the edges of the alluvial fan and in some areas may intersect with clay beds deposited in lakes. In general, the upper layers of the alluvial fan deposits form an unconfined to semi-confined aquifer system that provides a large amount of groundwater recharge area. For a geologic map and detailed description of the geologic formations present at KWB Lands, see Section 7.13, Cultural and Paleontological Resources.

Soils

Based on a review of U.S. Natural Resources Conservation Service (NRCS) soil survey data², soils at the KWB consist of silty, sandy, and clayey loams. These soils are moderately susceptible to water erosion and are highly to moderately susceptible to wind erosion. The sandy loam deposits are highly permeable, but are interbedded with lower permeability areas (i.e., a slower water infiltration rate) comprised of fine-grained silt and clay deposits. Soils that have a low infiltration rate also have a high water runoff potential.

Liquefaction

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and become fluid, similar to quicksand. Factors determining liquefaction potential are type and consistency of soils, the level and duration of seismic ground motions, and the depth to groundwater. Loose sands and peat deposits, as well as uncompacted fill and other Holocene materials deposited by sedimentation in rivers and lakes (fluvial or alluvial deposits), as well as debris or eroded material (colluvial deposits), are more susceptible to liquefaction. Localities most susceptible to liquefaction-induced damage are underlain by loose, water-saturated, granular sediment within 40 feet of the ground surface. Liquefaction poses a hazard to engineered structures such as buildings, bridges, canals, and underground utility pipelines. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining walls, and slope instability.

The KWB Lands are located in a seismically active area. A series of earthquakes occurred in 1952 in the area of the White Wolf fault and subsequently in an area east of Bakersfield. On July 21, 1952, a magnitude 7.3 earthquake was recorded along the White Wolf fault south of Arvin; numerous aftershocks continued on July 21, six of which were magnitude 5.0 and above. On July 28, 1952, a magnitude 6.1 shock and several smaller aftershocks occurred east of Bakersfield. On August 22, 1952, a magnitude 5.8 earthquake also occurred east of Bakersfield. Aftershocks of magnitude 4.0 and higher were recorded in the area through September 26, 1952. These earthquakes resulted in surface fault rupture along the White Wolf fault and along several unnamed faults east of Bakersfield. The magnitude 7.3 earthquake resulted in 12 deaths and approximately \$60 million in property damage. Railways lines were offset, highways were cracked, older unreinforced buildings collapsed or were substantially damaged, and some newer reinforced concrete buildings were damaged. The magnitude 7.3 earthquake was felt over most of California, as well as parts of western Arizona and western Nevada. It was the largest earthquake since the 1906 San Francisco event (which occurred along the San Andreas fault).^{3,10}

The 1857 Fort Tejon earthquake caused surface fault rupture along the Cholame-Chorizo section of the San Andreas fault from Parkfield (in the Cholame Valley) south to Wrightwood, a distance of approximately 186 miles. The earthquake magnitude is estimated to have been 7.9. Property loss and destruction of buildings occurred at Fort Tejon, and seismic seiching, fissuring, sandblows, and hydrologic changes were reported from Sacramento to the Colorado River delta.⁴ The KWB is approximately 21 miles east of the Cholame-Chorizo section.

Although the KWB is located in a seismically active area and the surficial deposits consist of Holocene sediments, the depth to groundwater is approximately 50 feet or greater below the ground surface and the potential for liquefaction or lateral spreading is minimal.⁵

Subsidence

Subsidence of the land surface can be induced by both natural and human phenomena. Subsidence caused by natural phenomena can result from tectonic deformations and seismically induced settlements; from consolidation, hydrocompaction, or rapid sedimentation; from oxidation or dewatering of organic-rich soils; and from subsurface cavities. Subsidence related to human activity can result from withdrawal of subsurface fluids or sediment. The potential for failure from subsidence is highest in areas where the groundwater table is high and where relatively soft and recent alluvial deposits are present.

Effects Related to Groundwater Extraction

In Kern County, subsidence is caused primarily by the dewatering and subsequent compaction of unconsolidated clay and silt deposits within the groundwater aquifer, and oil and natural gas extraction.⁶ Between 1926 and 1970, subsidence within Kern County ranged from 4 to 28 feet (depending on location).⁷ Areas close to the Kern River and KWB Lands have historically experienced less subsidence than other areas in the San Joaquin Valley because local surface water supplies (rather than groundwater) have been used for irrigation, and because of aquifer recharge.⁸

Subsidence in the San Joaquin Valley has resulted in damage to the California Aqueduct along with various canals, roads, bridges, buildings, and well casings. Subsidence-related damages and repairs have included the loss of canal capacity to convey and deliver water or remove floodwaters; realignment of canals when their constant gradient becomes variable; raising of infrastructure such as canal check stations; and releveling of furrowed fields for maximum irrigation efficiency. The California Aqueduct, Delta-Mendota Canal, Outside Canal, Friant-Kern Canal, San Luis Canal, State Route 198, and other infrastructure in the San Joaquin Valley have all undergone repairs and modifications.^{9,10}

The benchmark network in the San Joaquin Valley is only periodically surveyed by the National Geodetic Survey. Control benchmarks are concentrated in the three major areas of known subsidence (Los Banos–Kettleman, Tulare-Wasco, and Arvin-Maricopa), with roughly 12 stable bedrock reference benchmarks around the perimeter of the valley.¹¹ As early as 1950, the California Department of Water Resources (Department) began installing and monitoring borehole extensometers (i.e., compaction recorders) in wells throughout the San Joaquin Valley to monitor subsidence.¹² By the end of the 1960s, the subsidence monitoring network consisted of 31 extensometers operating at 21 sites, but was reduced to 26 extensometers at 18 sites by the 1980s. Periodic measurements of 28 benchmarks distributed throughout KWB Lands have been used to monitor the land surface elevations.¹³ Since June 1994, the Department has independently maintained and monitored one extensometer and three transducers in well T30S/R25E-16L on KWB Lands, adjacent to a triple completion monitoring well (multiple completion wells allow for more sampling locations in an aquifer). Monitoring began before groundwater recovery operations began, thus allowing the tracking of subsequent land-surface elevation recovery and subsidence.

Effects Related to Fault Creep

Several researchers have indicated that historic fault creep along the Buena Vista, Premier, New Hope, and Kern Front faults, as well as historic-period fault breaks along the Garlock fault zone (in the Fremont Valley), are the result of subsurface withdrawal of oil, natural gas, and/or groundwater.^{14,15,16,17}

KWB Lands are not, however, within the immediate vicinity of these areas, and there is no evidence of fault creep that could affect or be affected by KWB activities.

7.8.2.2 Changes in Physical Setting between 1996 and 2014

Geological and soil conditions generally do not change within a short period of time and, therefore, the environmental setting described under 1994 conditions for the southern San Joaquin Valley portion of Kern County (including KWB Lands) are generally the same under 2014 conditions. However, text is added in the impact analysis to provide site-specific characteristics based on current soil survey data.

7.8.2.3 Regulatory Setting in 1995

Regulations related to geologic hazards and soil erosion relevant to KWB activities are described below.

Federal

There are no applicable federal regulations pertaining to seismic hazards or soil erosion applicable to KWB activities.

State

Major State regulations include the California Code of Regulations (CCR), Title 24, Part 2, the California Building Standards Code (CBC); and California Public Resources (CPR) Code, Division 2, Chapter 7.8, the Seismic Hazards Mapping Act. Both these regulations apply to public buildings and a large percentage of private buildings intended for human occupancy. The CBC is based on the Uniform Building Code (UBC), which is used widely throughout United States (adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous more detailed and/or more stringent regulations.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (California Public Resources Code [PRC] Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (CPR Sections 2690–2699.6) addresses earthquake hazards from nonsurface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. The act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

National Pollutant Discharge Elimination System Permit

In California, the State Water Resources Control Board (SWRCB) administers regulations promulgated by the United States Environmental Protection Agency (40 CFR Part 122) requiring the permitting of stormwater-generated pollution under the National Pollutant Discharge Elimination System (NPDES). In turn, the SWRCB's jurisdiction is administered through nine regional water quality control boards. Under these regulations, an operator must obtain a general permit through the NPDES Stormwater Program for all construction activities with ground disturbance of 1 acre or more. The general permit requires the implementation of Best Management Practices (BMPs) to reduce sedimentation into surface waters and to control erosion. One element of compliance with the NPDES permit is preparation of a Stormwater Pollution Prevention Plan (SWPPP) that addresses control of water pollution, including sediment, and the sources of runoff during construction.

Although the primary purpose of these regulations and standards is the protection of surface water resources from the effects of land development (such as turbidity caused by sedimentation), measures included in such regulations and standards also reduce the potential for erosion and soil loss resulting from construction activities. Such regulations include, but are not limited to, the NPDES program for management of construction and municipal stormwater runoff, which is part of the federal Clean Water Act and is implemented at the State and local level through issuance of permits and preparation of site-specific pollution protection plans. Sections 1600 through 1607 of the California Fish and Game Code regulates activities that would alter stream characteristics, including sedimentation caused by erosion.

Other Geotechnical Considerations

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter 33 regulates grading activities, including drainage and erosion control, and construction on expansive soils. Construction activities are subject to occupational safety standards for excavation,

shoring, and trenching as specified in the California Division of Occupational Safety and Health (Cal-OSHA) regulations (Title 8 of the CCR) and in Section A33 of the CBC.

Local

The *Kern County General Plan* contains goals and policies to address potential hazards associated with geologic and soil constraints. Based on the impact analyses presented below, there are no aspects of the KWB activities that would be considered inconsistent with general plan policies pertaining to geotechnical hazards or safety.

7.8.2.4 Changes in Regulatory Setting between 1996 and 2014

Local

Metropolitan Bakersfield General Plan

The *Metropolitan Bakersfield General Plan*,¹⁸ adopted in 2007, suggests that land use and grading practices should be designed to prevent soil erosion while protecting existing watercourses. The plan also contains policies designed to reduce the level of death, injury, property damage, economic and social dislocation and disruption of vital services that would result from earthquake damage.

7.8.3 IMPACTS AND MITIGATION MEASURES

7.8-1 Rates of erosion could potentially be affected by KWB activities.

1996 — 2014

Prior to 1996, approximately 3,034 acres of shallow recharge ponds existed in the Kern Fan Element. The KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; Kern Water Bank Authority (KWBA) operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (> 36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct.

Grading was required to construct the recharge ponds. However, construction of the ponds and associated berms occurred on topography that is relatively flat and required only minor grading and compaction of soils. Soils in the KWB Lands can generally be characterized as being moderately to highly erodible.

KWBA would have been required to comply with NPDES permit requirements, which include preparation of a site-specific SWPPP and implementation of BMPs specifically designed to control erosion and reduce the transport of sediment and other pollutants. The KWB Habitat Conservation Plan and Natural Community Conservation Plan (KWB HCP/NCCP) Vegetation Management Plan (see Appendix 7-7c) also includes standard measures to address potential topsoil loss and erosion. In addition, Mitigation Measure E-1 of the 1997 Monterey IS and Addendum (see Appendix 7-6a) requires a watering truck to be used to minimize fugitive dust generated during grading when conditions require, such as on dry, windy days. KWBA was required to comply with these requirements, which are specific enforceable performance standards.

Therefore, the impact of KWB construction activities from 1996 to 2014 with regard to soil erosion or topsoil loss was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed. No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants already have facilities in place to convey and exchange recovered water. Conveyance of KWB-recovered water used beyond KWB Lands is not anticipated to cause any substantial impacts to geologic and soil resources.

KWBA manages KWB Lands in accordance with the KWB HCP/NCCP approved by the U.S. Fish and Wildlife Service and California Department of Fish and Game in 1997. The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Approximately 490 acres of land adjacent to Interstate 5 are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. After 2003, development of this parcel was prohibited by the Settlement Agreement.

Grading would be required to construct the proposed facilities, including the recharge ponds. Construction of the ponds and other improvements would occur on topography that is relatively flat and that would require only minor grading and compaction of soils. Soils on KWB Lands can generally be characterized as being moderately to highly erodible. Construction activities, however, have the potential to cause erosion if not conducted properly.

The impact of KWB activities from 2015 to 2030 with regard to soil erosion or topsoil loss could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.8-1 would reduce Impacts of KWB activities with regard to soil erosion or topsoil loss to less than significant. KWBA is subject to legal requirements regarding NPDES permits (see Section 7.0.4.1.1 covering NPDES permits) in subsection a) below and is obligated to carry out the measures (see Section 7.0.4.2.1 covering HCP Incidental Take Permits and Section 7.0.4.3.1 covering the 1997 Monterey IS and Addendum) in subsections b) and c) below. Therefore, KWB activities from 2015 to 2030 with regard to soil erosion or topsoil loss would be ***less than significant, with mitigation.***

7.8-1 *KWBA will implement the following measures:*

- a) *Comply with NPDES permit requirements, which include preparation of a site-specific SWPPP and implementation of BMPs specifically designed to control erosion and reduce the transport of sediment and other pollutants (see Section 7.0.4.1.1).*
- b) *Comply with measures in the KWB HCP/NCCP Vegetation Management Plan, including the following specified for sediment removal and erosion control (see Appendix 7-7c):*
 - i. *Sediment build up in canals and recharge basins must be removed to maintain adequate flow and water capacity in canals and to maintain good percolation in recharge basin. Sediment is typically removed mechanically with an excavator. To minimize transport costs of disposal, the loose soil sediments are typically placed on or near levees and canals. When feasible, islands in the recharge basis will be constructed from the spoil of the removal process. If this practice is to continue, then newly placed soils will be compacted onto the levee side slopes and tops where appropriate in areas that are not known to support kit fox dens, Tipton kangaroo rat burrows, blunt-nosed leopard lizards or burrowing owl holes. Hay mulch may be applied to the bare slopes and seed would occur at the proper time of year as appropriate. The elimination of bare soil conditions will decrease erosion. In addition, establishing marsh vegetation at the head of stream flow patterns will filter water and reduce sediment transport through the system.*
 - ii. *Water conveyance structures and control devices require periodic erosion control protection measures. Concrete riprap is typically used near the structures to prevent excessive erosion. Sidebank blowouts near conveyance structures shall be refilled and revegetated where appropriate.*
- c) *Use a watering truck to minimize fugitive dust generated during grading when conditions require, such as on dry, windy days (1997 Monterey IS and Addendum, Measure E-1)(see Appendix 7-6a).*

7.8-2 **KWB activities could potentially expose people and structures to risks from unstable soils (liquefaction).**

1996 — 2014

The White Wolf and San Andreas faults, which are considered to be active and are known to have produced large magnitude earthquakes, are located approximately 18 and 21 miles from the KWB, respectively. Although the KWB is located in a seismically active area and the surficial deposits consist of unconsolidated Holocene sediments (which are more susceptible to liquefaction), the depth to groundwater is approximately 50 feet or greater below the ground surface and the liquefaction potential is low.

Therefore, the impact of KWB activities from 1996 to 2014 as related to liquefaction was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

The White Wolf and San Andreas faults, which are considered to be active and are known to have produced large magnitude earthquakes, are located approximately 18 and 21 miles from the KWB, respectively. Although the KWB is located in a seismically active area and the surficial deposits consist of unconsolidated Holocene sediments (which are more susceptible to liquefaction), the depth to groundwater is approximately 50 feet or greater below the ground surface and the liquefaction potential is low.

Therefore, the impact of KWB activities from 2015 to 2030 as related to liquefaction would be ***less than significant***.

Mitigation Measures

None required.

7.8-3 KWB activities could potentially cause or contribute to subsidence as a result of groundwater extraction.**1996 — 2014**

Land subsidence in the San Joaquin Valley is caused by compaction of the interbedded layers of clay and silt within the aquifer system resulting from groundwater level changes. The KWB on-site extensometer showed little compaction occurring on KWB Lands, only several hundredths of a foot, through the early 1990s. From 1994 to May 2013, KWB Lands experienced a net rise in the land surface elevation of approximately three-quarters of a foot (Figure 7.8-1).¹⁹

During the 1970s, before artificial recharge activities, groundwater levels throughout the San Joaquin Valley and in areas of Kern County had reached historical lows. However, from June 1994 (just before the start of recharge operations at the KWB) to May 2013, there was an overall net rise in the land surface elevation and an increase in groundwater levels. Therefore, subsidence was measured during periods of drought and high groundwater withdrawals, but was offset during periods of groundwater recharge when soil expansion occurred within the aquifer.

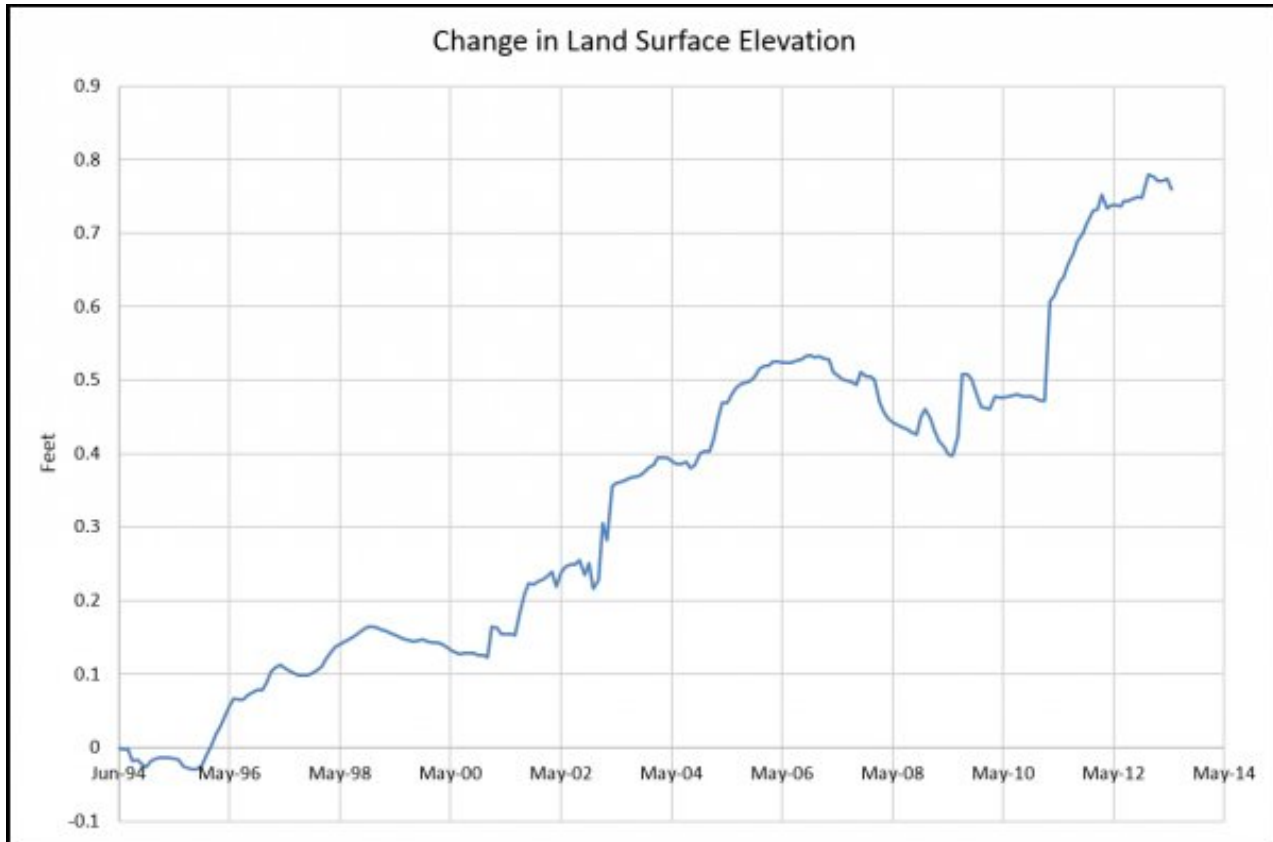
The KWB aquifer contains a substantial amount of sand, with lesser amounts of gravel, silt, and clay.²⁰ Aquifers with higher volumes of sand and gravel are not as susceptible to compaction as aquifers with

higher volumes of clays and fine silts. A continuous reading extensometer located in KWB has shown little response to changes in water level changes during recharge or recovery operations.

Therefore, the impact of KWB activities from 1996 to 2014 on land subsidence was **less than significant**.

Mitigation Measures

None required.



Source: Adapted by KWBA in 2014 with data provided by DWR Water Data Library in 2014.

Figure 7.8-1. Land Surface Elevation at Well T30S/R25E-16L1 between June 1994 and May 2013

2015 — 2030

The Department has an on-site subsidence monitoring program that has been effective in monitoring subsidence throughout KWB Lands and none has been observed. The program allows for identifying and tracking the development and progression of potential land subsidence.

Therefore, the impact of KWB activities from 2015 to 2030 on land subsidence would be **less than significant**.

Mitigation Measures

None required.

ENDNOTES

1. California Department of Water Resources. 1986. *Draft Environmental Impact Report on Kern Water Bank Project*.
2. U.S. Natural Resources Conservation Service. 2014 (September). Web Soil Survey. Available: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed May 1, 2015.
3. Smith, T.G. 1984 (February). Faults East of Bakersfield, Kern County. Fault Evaluation Report FER-145. California Division of Mines and Geology. Sacramento, CA.
4. U.S. Geological Survey. 2014. Historic Earthquakes, Fort Tejon, California. Available: http://earthquake.usgs.gov/earthquakes/states/events/1857_01_09.php. Last updated April 18, 2014. Accessed May 13, 2015.
5. California Department of Water Resources. 2010. Lines of Equal Depth to Water in Wells, Unconfined Aquifer. Available: http://www.water.ca.gov/groundwater/data_and_monitoring/south_central_region/GroundwaterLevel/gw_level_monitoring.cfm. Last updated September 2014. Accessed March 14, 2015.
6. Sneed, M., J. Brandt, and M. Solt. 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.
7. Sneed, M., J. Brandt, and M. Solt. 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.
8. Ireland, R. L., J. F. Poland, and F. S. Riley. 1984. Land Subsidence in the San Joaquin Valley, California, as of 1980. U.S. Geological Survey Professional Paper 437-I. Prepared in cooperation with the California Department of Water Resources. Washington, DC: U.S. Government Printing Office.
9. Sneed, M., J. Brandt, and M. Solt. 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.
10. Luhdorff & Scalmanini Consulting Engineers. 2014 (July). *Land Subsidence from Groundwater Use in the San Joaquin Valley*. Prepared by J. Borchers, and M. Carpenter, with support by the California Water Foundation. Available: <http://www.groundwatervoices.com/wp-content/uploads/2014/07/San-Joaquin-Subsidence-Report-July-24-2014.pdf>. Accessed March 5, 2015.

11. Ireland, R. L., J. F. Poland, and F. S. Riley. 1984. Land Subsidence in the San Joaquin Valley, California, as of 1980. U.S. Geological Survey Professional Paper 437-I. Prepared in cooperation with the California Department of Water Resources. Washington, DC: U.S. Government Printing Office.
12. Sneed, M., J. Brandt, and M. Solt. 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.
13. Kern County Water Agency. 1996 (August). Proposed Monitoring Plan for the Kern Fan Element of the Kern Water Bank. Draft Report. Bakersfield, CA. Prepared by Kenneth D. Schmidt and Associates, Fresno, CA.
14. Jennings, C. W. 1994. Fault Activity Map of California and Adjacent Areas. Geologic Data Map No. 6. Sacramento: California Division of Mines and Geology.
15. Smith, T. G. 1984 (May). Buena Vista Fault, Kern County. Fault Evaluation Report FER-163. California Division of Mines and Geology. Sacramento, CA.
16. Smith, T. G. 1983 (December). Kern Front, New Hope, and Premier Faults, Kern County. Fault Evaluation Report FER-143. California Division of Mines and Geology. Sacramento, CA.
17. Castle, R. O., J. P. Church, R. F. Yerkes, and J. C. Manning. 1983. Historical Surface Deformation near Oildale, California. U.S. Geological Survey Professional Paper 1245. U.S. Government Printing Office. Washington, DC.
18. Kern County Planning Department. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007.
19. Kern Water Bank Authority. 2014. *Land Subsidence: Land Subsidence and the Kern Water Bank*. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/1560>. Accessed March 3, 2015.
20. California Department of Water Resources. 1986. *Draft Environmental Impact Report on Kern Water Bank Project*.

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7.9 RECREATION (REVISED)

7.9 RECREATION (REVISED)

7.9.1 INTRODUCTION

7.9.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.9 identified potential impacts to recreation as a result of the transfer of the Kern Fan Element. Text from DEIR Section 7.9 that discusses KWB activities is copied below and shows revisions to this section. All other text in DEIR Section 7.9 remains unchanged.

Table 7.9-1A identifies the potentially affected environmental resources from impacts of KWB activities on recreation.

TABLE 7.9-1A

IMPACTS OF KWB ACTIVITIES ~~PROPOSED PROJECT ELEMENTS~~ ON RECREATIONAL RESOURCES

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	KWB Element could potentially affect Changes in recreational resources within KWB Lands and KWB recharge operations could potentially affect and waterfowl and related recreational resources. NA	7.9-3NA

During public review of the NOP for ~~this the Monterey Plus~~ EIR, interested parties submitted comments regarding issues that should be evaluated in the EIR. One comment was received concerning recreational issues but no comments dealt with KWB activities.

7.9.1.2 Analytical Method

The assessment of impacts on recreational resources was conducted in accordance with standard professional practices for CEQA evaluations. A professional consultant ~~with substantial experience in recreational resource assessment conducted site visits to areas with recreational resources that could be affected. and~~ reviewed project information, Kern Water Bank Authority (KWBA) annual reports, recreation information for nearby areas, and county and local plans. Information considered in the recreation resource analysis included past recreation use, current recreation use/facilities, recreation use/facilities on adjacent areas, and potential future recreation use and facilities.

The analysis included a review of the environmental setting, impacts, and mitigation measures related to recreation, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.9.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA ~~g~~ Guidelines. For the purposes of the REIR, impacts on recreational resources would be considered significant if the KWB activities~~proposed project~~ would:

- substantially damage recreational resources or facilities; or
- result in a substantial reduction in recreational use or activities.

7.9.2 ENVIRONMENTAL SETTING

7.9.2.1 Physical Setting in 1995

Prior to the California Department of Water Resources' (Department's) purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. Most of the land was used previously for agriculture, and irrigation water was provided by surface water deliveries by the former James-Pioneer Improvement District of North Kern Water District and by groundwater pumping.

The KFE property included a number of agricultural wells and conveyance facilities that had been constructed primarily to deliver irrigation water for the agricultural activity occurring then and historically

on the property. These facilities were not constructed for water bank operations of recharge and recovery, and many were not suitable for these purposes. A Memorandum of Understanding was signed between the Department and the Kern County Water Agency (KCWA) on March 25, 1987, that provided for the phase-out of all agricultural production on the KFE property by the end of 1993. In fact, one of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE property.

Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services Inc., had a residence with an equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property. The KFE property was not available for public recreation use, although some minor and informal recreation activities may have occurred, including birdwatching and picnicking.¹

7.9.2.2 Changes in Physical Setting between 1996 and 2014⁰³

Since 1995, KWB Lands have been used for public and private hunting activities, birdwatching, water education, and organized nature hikes.²

In 1998, an amendment to the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) was executed to allow public and private hunting on KWB Lands. From 1997 to 2006, safflower was farmed on 45–60 acres of KWB Lands for dove habitat improvement. During these years, KWBA cooperated with CDFG to use KWB Lands as part of the Game Bird Heritage Dove Hunt for approximately 100 hunters per season.^{3,4,5,6,7,8,9,10} The safflower crop became stressed as a result of reduced soil fertility, and since 2007, KWB Lands have not been a location for the dove hunt. Since 1997, KWBA also cooperated with CDFG to allow a limited waterfowl hunt, although this occurred only a few times because unpredictable aspects of winter recharge made it difficult to identify when sufficient recharge water would be available to hold birds at the site.¹¹ In 1997, KWBA also cooperated with CDFG to allow a family pheasant hunt to occur on KWB Lands. KWBA has offered limited private hunting of dove, quail, and waterfowl since 1998 for generally 20 or fewer hunters who obtain permits from KWBA.^{12,13,14,15,16,17,18,19} Some illegal hunting has occurred at the KWB, including poaching on non-hunt days and hunting in no-hunt zones. KWBA staff, CDFG (now the California Department of Fish and Wildlife) wardens, and security officers monitor activities and cooperate to eliminate any illegal hunting identified.^{20,21,22,23,24,25}

The Kern Audubon Society regularly conducts guided birdwatching outings on KWB Lands and includes KWB Lands in its popular Christmas Bird Count.²⁶

KWB Lands are popular for tours, with KWBA hosting a variety of groups including state and federal agencies, water districts, high school and university students, financial organizations, water-related organizations and agencies, environmental and educational groups, elected officials, foreign and other state (non-California) government officials, agricultural organizations, utility companies, engineering organizations, SWP contractors, and private groups and individuals.^{27,28,29,30,31,32,33,34,35,36} The KWB is also a stop on the Central Valley Water Tour given by the Water Education Foundation.³⁷ Generally, 100–300 people a year tour KWB Lands.³⁸ KWBA has also cooperated with the Tinoqui-Chalola Council of Kitanemuk & Yowlumne Tejon Indians to allow the annual spirit walk to include walking across KWB Lands as part of the route from Beach Park to the Tule Elk State Natural Reserve.³⁹

Recreation activities also take place on surrounding lands, including the Buena Vista Aquatic Recreational Area, Tule Elk State Natural Reserve, and Kern River Parkway. The Buena Vista Aquatic Recreational Area is south of KWB Lands and provides opportunities for camping, fishing, picnicking,

boating, and golfing.⁴⁰ Also located south of KWB Lands is the Tule Elk State Natural Reserve, which provides opportunities for picnicking, interpretation and education, wildlife viewing, and geocaching.⁴¹ Located between the KWB parcels and farther upstream on the Kern River is the Kern River Parkway. The parkway is a 20-mile native riparian area that encompasses 6,000 acres of trails, parks, and waterways. A popular facility within the parkway is the Kern River Parkway Trail, which extends through the City of Bakersfield's 2,800-acre Recharge Project area, located between the two KWB parcels. The parkway provides opportunities for walking/hiking, biking, horseback riding, canoeing, kayaking, fishing, photography, sightseeing, and attending special events.^{42,43} Surrounded by KWB Lands is Kern County Raceway Park, a 0.5-mile oval speedway located on Enos Lane just off Interstate 5. The racetrack opened to the public on May 4, 2013. The track has 5,000 seats for fans, and room to expand to 17,000 seats for various events. It also contains 21 suites in the grandstand along with 18 concession stands.

7.9.2.3 Regulatory Setting in 1995

Metropolitan Bakersfield General Plan and Kern County General Plan, Kern River Plan Element

The Kern River Plan Element of the *Metropolitan Bakersfield General Plan and Kern County General Plan* (adopted by the City of Bakersfield in August 1985 and Kern County in July 1985) include goals and policies related to access, open space, floodplain management, and private property and public use, among other topics. Specific policies that are applicable to KWB Lands are listed below.

Section 3.4, "Floodplain Management"

- **Policy 7:** Recreational activities, both active and passive, shall be allowed in the area of the secondary floodway. Improvements for access, such as trails and parking areas, and for facilities such as parks and picnic areas, shall be allowed as long as adverse effects on riparian vegetation and wildlife habitat are minimized.
- **Policy 8:** Recreational uses which require minimum physical development shall be encouraged as long as public health and safety are not put at risk. Such uses would include riding and hiking trails, fishing access, view areas, and beaches.
- **Policy 13:** Design riding and hiking trails, nature study areas, and other nonintensive forms of recreation to be compatible with water recharge facilities, structures, and uses.

Section 3.5, "Private Property and Public Use"

- **Policy 2:** Open space qualities of the Kern River primary and secondary floodway shall be protected consistent with policies of this plan, regardless of whether the land is in public or private ownership.
- **Policy 7:** Public and private organizations and individuals shall be encouraged to seek suitable means of protecting and enhancing areas of riparian habitat, resolving environmental conflicts in the River area, and developing a cooperative system of riding, hiking, bicycle, and foot access trails in the River corridor

Section 4.11, "Recreation"

- **Policy 7:** Privately developed public recreation areas shall be encouraged in the plan areas as consistent with all other goals and policies of this plan.⁴⁴

7.9.2.4 Changes in Regulatory Setting between 1996 and 2014~~03~~

Kern County General Plan, Land Use, Open Space, and Conservation Element

The Public Facilities and Services section of the *Kern County General Plan's* Land Use, Open Space, and Conservation Element (adopted in 2004 and amended in 2009) describes goals, policies, and implementation measures for recreation in the county, including providing recreation opportunities, parks, and recreation facilities and programs for all Kern County residents. There are no specific goals or policies related to recreation along the Kern River.⁴⁵ Land uses in the *Kern County General Plan* within KWB Lands include agriculture, mineral and petroleum, shallow groundwater, and flood hazard. There are no public facilities and services uses within KWB Lands.^{46,47}

Metropolitan Bakersfield General Plan, Parks Element

The *Metropolitan Bakersfield General Plan* also includes a Parks Element (adopted in 2002 and amended in 2007) that describes goals for the provision of recreation facilities in the larger Bakersfield planning area, as well as policies related to recreation along the Kern River, including:

- **Policy 13:** Evaluate the feasibility of including new regional parks as a component of proposed groundwater recharge areas.
- **Policy 14:** Plan for and expand regional recreation opportunity in connection with the development and conservation of appropriate areas along the Kern River.
- **Policy 15:** Designate multiple purpose areas for recreation and park use within the Kern River Plan area and in accordance with the goals and policies in the Kern River Plan Element.⁴⁸

Bakersfield Recreation and Parks Master Plan

The *Bakersfield Recreation and Parks Master Plan* (2007) contains general policies and guidelines, as well as implementation strategies, for parks and recreation within the Bakersfield planning area, which includes lands in the Kern River Parkway that are surrounded by KWB Lands. Three specific implementation strategies pertain to the Kern River Parkway, of which the City of Bakersfield's 2,800-acre Recharge Project area is a part. These implementation strategies focus on creating an urban forest within the parkway and expanding trails to and within the parkway. The specific Kern River Parkway implementation strategies are as follows:

- Action Item 6.1.2: Continue to expand multi-purpose trails for walking and jogging along the Kern River Parkway. Consider using a sponsorship program to add quarter-mile markers. Try pursuing health grants from the Tobacco Fund Grant Program to purchase and install par courses and fitness stations along the multi-purpose trails.
- Action Item 6.7.3: In cooperation with the Kern River Parkway Committee, consider designating the Kern River Parkway an urban forest and pursue programs for community organizations to donate trees, plant trees and/or conduct fund raising activities to purchase trees for the parkway to provide more shade along the trail; try introducing more native tree species; and remove non-native, intrusive plant material to create a major native tree urban forest. This program would enhance the visual appearance of the Kern River Parkway, act as a destination attraction and draw tourist, and position the City for a number of environmental improvement grant opportunities.
- Action Item 6.10.2: Think about working with the railroads to establish a multi-purpose loop trail connecting the upper and lower segments of the Kern River Parkway by providing a dedicated separate trail along the active railroad right of way.

The 2,800-acre City of Bakersfield Recharge Project area is outside of the Kern River Parkway master plan area.⁴⁹

7.9.3 IMPACTS AND MITIGATION MEASURES

7.9-3 KWB activities could potentially affect recreational resources within KWB Lands.

1996 — 2014

After the transfer of the KFE property, these previously publicly inaccessible lands became open for limited public recreation use, resulting in increased recreation opportunities for hunting, interpretation, education, birdwatching, and hiking. Much of the increased recreational opportunities was related to recharge of recharge ponds and the resulting increase in waterfowl populations and related recreation.

Therefore, the impact from KWB activities from 1996 to 2014 on recreational resources was ***less than significant***.

In addition, KWB activities from 1996 to 2014 have resulted in benefits to recreational resources on KWB Lands.

Mitigation Measures

None required.

2015 — 2030

It is expected that existing limited public recreation use for hunting, interpretation, education, birdwatching, and hiking would continue in 2015–2030, and possibly increase, as it has over time since 1995. KWB recharge operations would not change substantially such that any of these recreation activities would be significantly affected. Moreover, KWBA is planning to develop an additional 190 acres (near-term) and up to 862 acres (long-term) of recharge ponds at full build-out that could increase the extent, quality, and availability of recreation opportunities, especially related to waterfowl.

Therefore, the impact of KWB activities from 2015 to 2030 on recreational resources would be ***less than significant***.

In addition, KWB activities from 2015 to 2030 are likely to result in benefits to recreational resources on KWB Lands.

Mitigation Measures

None required.

ENDNOTES

1. Central Coast Water Authority. 1995 (May). *Draft Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA. Page 4-83.
2. Kern Water Bank Authority. 2015. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed April 20, 2015.
3. Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan Annual Compliance Report—January 1, 1998 through December 31, 1998*. Bakersfield, CA.
4. Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.
5. Kern Water Bank Authority. 2001 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2000 Annual Compliance Report and 2001–2002 Management Plan*. Bakersfield, CA.
6. Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA. Page 22 and 23.
7. Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Report and 2003–2004 Management Plan*. Bakersfield, CA.
8. Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Report and 2004–2005 Management Plan*. Bakersfield, CA.
9. Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Report and 2005–2006 Management Plan*. Bakersfield, CA.
10. Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Report and 2006–2007 Management Plan*. Bakersfield, CA.
11. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA.
12. Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan Annual Compliance Report—January 1, 1998 through December 31, 1998*. Bakersfield, CA.

13. Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.
14. Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Report and 2006–2007 Management Plan*. Bakersfield, CA.
15. Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA.
16. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA.
17. Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA.
18. Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA.
19. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA.
20. Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan Annual Compliance Report—January 1, 1998 through December 31, 1998*. Bakersfield, CA.
21. Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.
22. Kern Water Bank Authority. 2001 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2000 Annual Compliance Report and 2001–2002 Management Plan*. Bakersfield, CA.
23. Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA.
24. Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Report and 2003–2004 Management Plan*. Bakersfield, CA.
25. Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Report and 2004–2005 Management Plan*. Bakersfield, CA.

26. Kern Water Bank Authority. 2015. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed April 20, 2015.
27. Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA.
28. Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Report and 2003–2004 Management Plan*. Bakersfield, CA.
29. Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Report and 2004–2005 Management Plan*. Bakersfield, CA.
30. Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Report and 2005–2006 Management Plan*. Bakersfield, CA.
31. Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Report and 2006–2007 Management Plan*. Bakersfield, CA.
32. Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA.
33. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA.
34. Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA.
35. Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA.
36. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA.
37. Kern Water Bank Authority. 2015. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed April 20, 2015.
38. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA.

39. Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Report and 2005–2006 Management Plan*. Bakersfield, CA.
40. Kern County Parks and Recreation. 2015. Map of Buena Vista Aquatic Recreation Area. Available: <http://www.co.kern.ca.us/parks/pdf/bv-map.pdf>. Accessed April 20, 2015.
41. California Department of Parks and Recreation. 2015. Tule Elk State Natural Reserve. Available: http://www.parks.ca.gov/?page_id=584. Accessed April 22, 2015.
42. City of Bakersfield Recreation & Parks. 2015. Kern River Parkway & Bakersfield's Bicycle Trails. Available: http://www.bakersfieldcity.us/recreation/Kern_River_Parkway.htm. Accessed April 22, 2015.
43. City of Bakersfield Recreation & Parks. 2015. Kern River Parkway Trail map. Available: http://www.bakersfieldcity.us/recreation/pdfs/2013_Parkway_Trail.pdf. Accessed April 22, 2015.
44. City of Bakersfield and Kern County. 1985 (July). *The Kern River Plan Element: An Integral Part of the City of Bakersfield General Plan and the Kern County General Plan*. Bakersfield, CA.
45. Kern County Planning Department. 2009 (September 22). *Kern County General Plan, Land Use, Open Space, and Conservation Element*. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009.
46. Kern County. 1982 (April 15). *Kern County General Plan. Land Use, Open Space, & Conservation Element, Taft Priority Area Land Use Map*. Adopted by the Kern County Board of Supervisors March 1, 1982, as part of the *Kern County General Plan*, Resolution No. 820177.
47. Kern County. 1982 (April 15). *Kern County General Plan. Land Use, Open Space, & Conservation Element, Kern County, Western Section Land Use Map*. Adopted by the Kern County Board of Supervisors March 1, 1982, as part of the *Kern County General Plan*, Resolution No. 820177.
48. City of Bakersfield and Kern County. 2002 (December). *Metropolitan Bakersfield General Plan*. Chapter XI, Parks Element. Adopted by the City of Bakersfield on December 11, 2002, and effective February 26, 2003, as per Resolution No. 222-02. Bakersfield, CA.
49. MIG. 2007. *Bakersfield Recreation and Parks Master Plan*. Fullerton, CA. Prepared for the City of Bakersfield, Bakersfield, CA. Available: http://www.bakersfieldcity.us/recreation/pdfs/Rec_Parks_Master_Plan.pdf. Accessed April 21, 2015.

7.10 LAND USE AND PLANNING (NEW)

7.10 LAND USE AND PLANNING (NEW)

7.10.1 INTRODUCTION

7.10.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- Transfer of property known as the “Kern Fan Element property” in Kern County;*
- Water supply management practices; and*
- Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.10 identified potential impacts to land use and planning as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.10 that discusses KWB activities. All other text in DEIR Section 7.10 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.10-1A identifies the potentially affected environmental resources from impacts of KWB activities on land use and planning.

TABLE 7.10-1A**IMPACTS OF KWB ACTIVITIES ON LAND USE AND PLANNING**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Change in land use could potentially conflict with adopted general plan policies, land use designations, and zoning codes	7.10-1, 7.10-2

During public review of the Notice of Preparation for the Monterey Plus EIR, interested parties submitted no comments on land use and planning.

7.10.1.2 Analytical Method

The assessment of impacts to land use resources was conducted in accordance with standard professional practices for documents prepared pursuant to the California Environmental Quality Act (CEQA) documents. Factors considered in the analysis included:

- the actual and projected nature and magnitude of changes in land use;
- the number of established communities that would be physically divided;
- likely reactions to changes in land uses;
- *Kern County General Plan*;¹
- *Metropolitan Bakersfield General Plan* (Unincorporated Planning Area);²
- Kern County Zoning Code;
- KWB Habitat Conservation Plan/Natural Communities Conservation Plan (KWB HCP/NCCP) annual compliance and management reports; and
- field review and consultation with appropriate agencies.

Substantial changes are defined as changes beyond those normally observed because of historical variation or fluctuation, changes that are disproportionate to any previously experienced, or irreversible changes that would negatively affect an average person's impression of an area.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to land use and planning, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.10.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For the purposes of this EIR, impacts to land use resources would be considered significant if KWB activities would:

- physically divide an established community;
- substantially conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;

- substantially conflict with any applicable habitat conservation plan or natural community conservation plan; or
- induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).

KWB activities would not induce substantial population growth directly or indirectly or displace substantial numbers of people or existing housing within KWB Lands. Therefore, this potential impact is not discussed further in this section. However, indirect impacts as a result of population growth from providing water supplies for urban uses are presented in Chapter 8, Growth-Inducing Impacts.

Any consistency issues between KWB activities and local land use designations and zoning are issues related to land use regulations; they are not issues related to a physical environmental impact of KWB activities. Therefore, any such consistency issues are not considered a significant land use and planning impact under CEQA, in and of themselves. Specific impacts and consistency with local land use designations associated with other resource and issue areas are addressed in each technical section of this draft REIR, as appropriate. These technical sections provide an analysis of other relevant physical environmental effects that could result from KWB activities.

7.10.2 ENVIRONMENTAL SETTING

7.10.2.1 Physical Setting in 1995

Prior to the California Department of Water Resources' (Department's) purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. Most of the land was used for agriculture, and irrigation water was provided by surface water deliveries by the former James-Pioneer Improvement District of the North Kern Water District and by groundwater pumping.

The KFE property included a number of agricultural wells and conveyance facilities that had been constructed primarily to deliver irrigation water for the agricultural activity occurring then and historically on the property. These facilities were not constructed for water bank operations of recharge and recovery, and many were not suitable for these purposes. Agricultural water supplies for lands surrounding the KFE property were provided by Rosedale-Rio Bravo Water Storage District for most lands to the north, by Kern Delta Water District for lands to the southeast, by Henry Miller Water District for lands to the south, and by Buena Vista Water Storage District for lands to the northwest. A memorandum of understanding signed between the Department and Kern County Water Agency (KCWA) on March 25, 1987, provided for the phase-out of all agricultural production in the KFE property by the end of 1993. One of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE property.

Before the KFE property was transferred to KCWA, the Department managed the KFE property by:

- performing demonstration studies and exploratory investigations for the potential development of the KFE property as a water banking facility; and
- controlling weeds, dust, trespassers, and vandalism.

Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services Inc., had a residence with an

equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property.

Approximately 320 acres of shallow recharge ponds had been constructed on the KFE property before the Department acquired the property. In 1995, approximately 3,034 acres of recharge ponds were constructed pursuant to the KCWA flood emergency program. Surrounding lands were used primarily for agriculture, habitat preserves, or other water banking programs.

7.10.2.2 Changes in Physical Setting between 1996 and 2014

Southern San Joaquin Valley Portion of Kern County Including KWB Lands

The KWB is one of several groundwater banks in Kern County. Other groundwater banks include: City of Bakersfield 2,800 Acre Recharge Project (operational since 1978); West Kern/Buena Vista (operational since 1978); Berrenda Mesa Project (operational since 1983); Arvin-Edison Water Storage District (operational for groundwater banking for other districts since 1990); Semitropic Water Storage District (operational for groundwater banking for other districts since 1990); Pioneer Project, including Kern River Channel (operational since 1995); Rosedale-Rio Bravo Water Storage District Banking Program (operational since 2003); Kern Delta Water Storage District (operational since 2003); Buena Vista Water Storage District (operational since 2003); and Irvine Ranch Water District – Strand Ranch Integrated Banking Project (operational since 2013). With the exception of the Arvin-Edison, Berrenda Mesa Project, Kern Delta, and Semitropic groundwater banks, all of the projects are located adjacent to KWB Lands on the Kern River Alluvial Fan.

KWB Lands

The KWB facilities include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct. Approximately 60 miles of Pacific Gas and Electric Company electrical power poles traverse KWB Lands. Various oil and gas companies maintain use of parcels on KWB Lands to exercise their mineral rights.

To protect endangered species on KWB Lands, the Kern Water Bank Authority (KWBA), the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG) developed the KWB HCP/NCCP to preserve and restore habitat for threatened, endangered, and protected species. USFWS and CDFG approved the KWB HCP/NCCP in October 1997 (see Appendix 7-7a). The KWB HCP/NCCP planning area consists of the entire KWB Lands. As part of the KWB HCP/NCCP, annual

mowing, livestock grazing (both cattle and sheep), and prescribed burning can all be used for vegetation management (see Appendix 7-7c).

The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Developed uses included farming, permanent facilities for the KWB, and commerce. Approximately 490 acres of land adjacent to Interstate 5 (I-5) are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. After 2003, development of this parcel was prohibited by the Settlement Agreement.

Since 1995, KWB Lands have been used for public and private hunting activities, birdwatching, water education, and organized nature hikes.³ Before 2005, CDFG sponsored both dove and waterfowl hunts. Safflower was farmed on about 70 acres under CDFG direction to enhance the dove hunt. Waterfowl hunts were also conducted under CDFG supervision on designated ponds in years with sufficient water.

Lands Adjacent to KWB

Agricultural land uses are located north of Stockdale Highway, south of Taft Highway, and east of Morris Road. The Irvine Ranch Water District's Strand Ranch property is located north and south of the Cross Valley Canal and west of Enos Lane adjacent to the northern boundary of KWB Lands. The Strand Ranch property includes recharge ponds, production wells, and monitoring wells.⁴

Land uses south of KWB Lands include a motel, retail, restaurants, warehouse, and recreational vehicle storage facility located at the intersection of Enos Lane and Taft Highway. The 6,100-acre Coles Levee Ecosystem Preserve is located south and southwest of KWB Lands, north and south of Taft Highway. The preserve was developed primarily as a conservation bank to offset oil and gas development activities.

In addition, the Green Acres Farm is located south of KWB Lands, east of Enos Lane, and south of Taft Highway. The 4,688-acre Green Acres Farm is used by the City of Los Angeles as a beneficial reuse site for disposal of biosolids generated by Los Angeles. Agricultural activities produce nonfood chain crops such as wheat, corn, alfalfa, oats, Milo, and Sudan grass that are sold as feedstock to local dairies.⁵

The Tule Elk State Natural Reserve is located west of Morris Road and borders the western boundary of KWB Lands. The approximately 950-acre preserve is managed by the California Department of Parks and Recreation and protects a small herd of tule elk. The park has a picnic and viewing areas, interpretive exhibits, and a visitor center.⁶

Kern County Raceway Park is a 120-acre multiuse facility which is surrounded by KWB Lands at the intersection of Enos Lane and I-5. The park includes a speedway; four-story control tower and concession building; parking; and a 250,000-square-foot paved infield for concerts, trade shows, motorcycle racing, drifting, and other events.⁷

Located between KWB Lands east of I-5 and farther upstream on the Kern River is the Kern River Parkway. The Kern River Parkway Trail, which extends through the City of Bakersfield's 2,800-acre recharge area, is located between the two parcels constituting KWB Lands. The parkway provides opportunities for walking/hiking, biking, horseback riding, canoeing, kayaking, fishing, photography, sightseeing, and attending special events.^{8,9}

7.10.2.3 Regulatory Setting in 1995

Federal

There are no applicable federal regulations pertaining to land use.

State

There are no applicable state regulations pertaining to land use.

Local

Regulations related to land use relevant to the KWB activities are described below.

7.10.2.4 Changes in Regulatory Setting between 1996 and 2014

Kern County General Plan

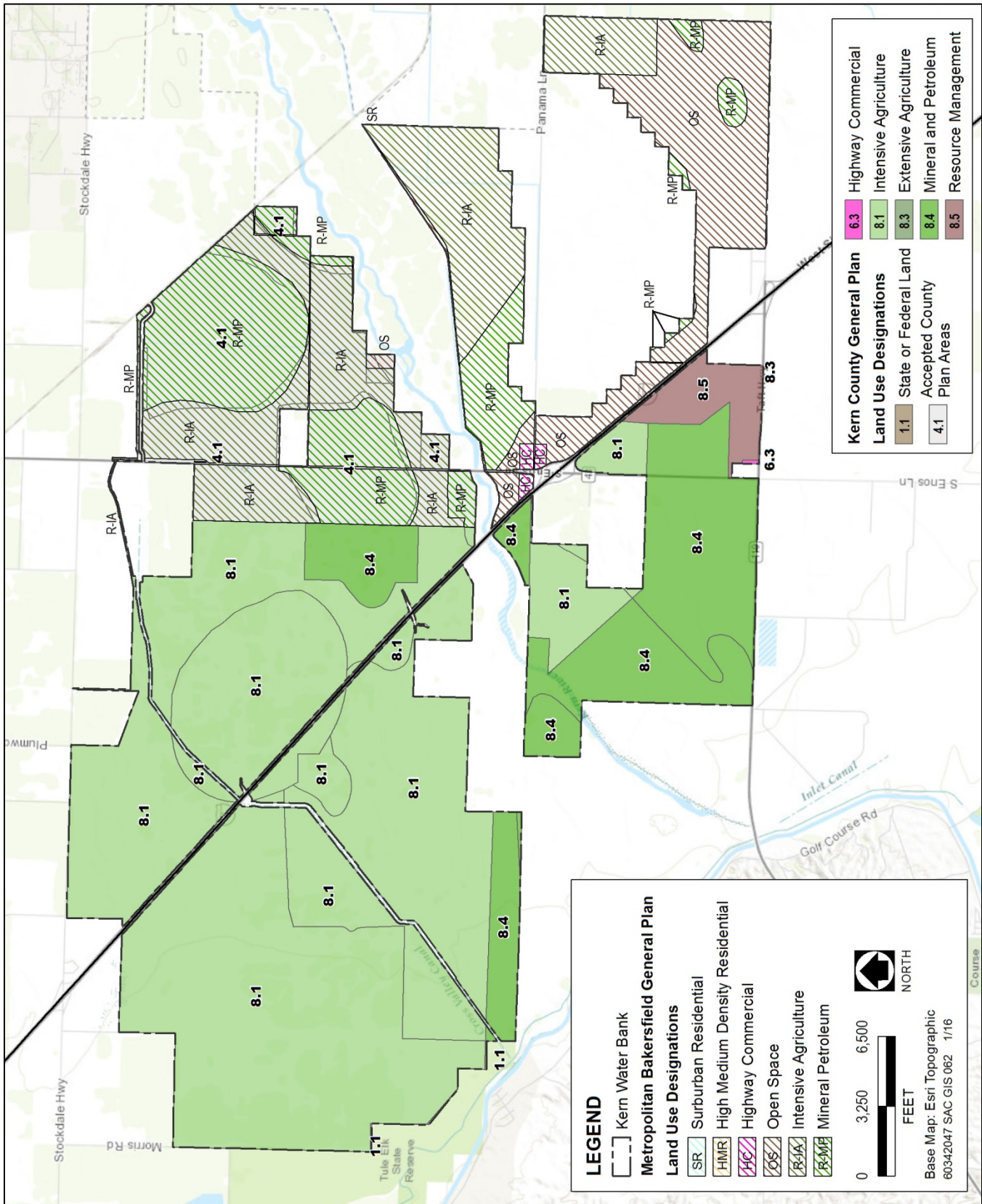
KWB Lands fall within both the *Kern County General Plan* and the *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*. Figure 7.10-1 shows which lands are governed by which plans. Figure 7.10-2 shows existing KWB land uses. The *Kern County General Plan* was adopted by the Kern County Board of Supervisors on June 15, 2004, and was last amended on September 22, 2009. The *Kern County General Plan* identifies policies that provide long-range guidance to county officials who make decisions that will affect growth and resources in unincorporated Kern County, excluding the unincorporated portion of the county within the metropolitan Bakersfield planning area. The general plan helps ensure that day-to-day planning and land use decisions conform with the long-range program. The plan is reviewed and updated periodically as the goals and requirements of the community evolve.¹⁰

Goal and Policies

The following goal and policies related to land use and planning from the Land Use, Open Space, and Conservation Element of the *Kern County General Plan* would be applicable to KWB activities:

Goal 3: Ensure the development of resource areas minimize effects on neighboring resource lands.

- **Policy 10:** To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:
 - Promote groundwater recharge activities in various zone districts.
 - Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
 - Support the development of groundwater management plans.
 - Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater and desalination.
- **Policy 15:** Agriculture and other resource uses will be considered a consistent use in areas designated for Mineral and Petroleum Resource uses on the General Plan.



Source: Sources: City of Bakersfield, July 2014; Kern County, March 2013

Figure 7.10-1. General Plan Land Use Designations

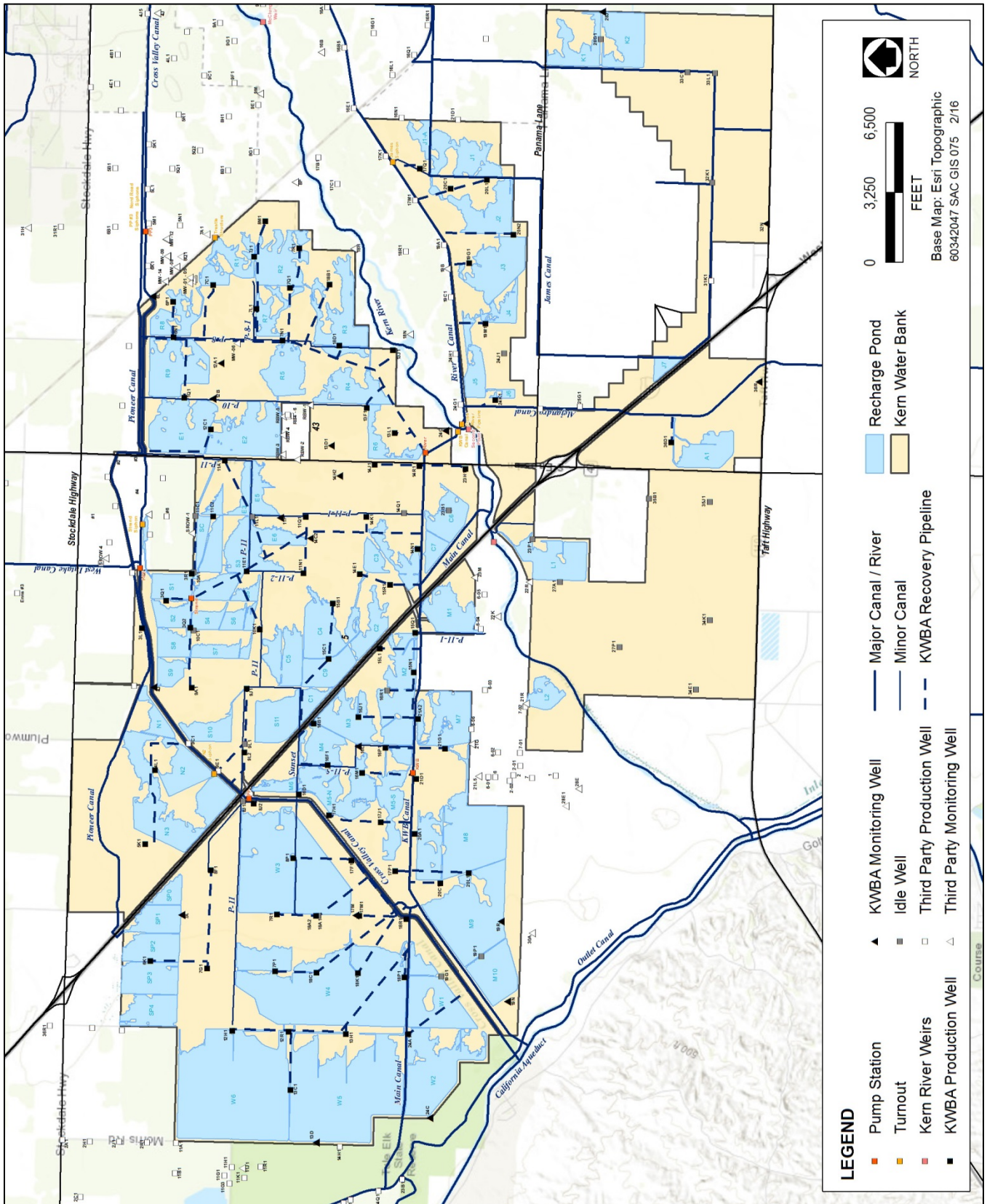


Figure 7.10-2. Existing KWB Land Uses

Land Use Designations

Those portions of KWB Lands governed by the *Kern County General Plan* are designated as Intensive Agriculture, Resource Management, and Mineral and Petroleum. The general plan describes these land use designations as follows:

- Map Code 8.1 (Intensive Agriculture).** This designation identifies areas devoted to the production of irrigated crops or having a potential for such use. The Intensive Agriculture designation allows for irrigated cropland; orchards; vineyards; horse ranches; raising of nursery stock ornamental flowers and Christmas trees; one single-family dwelling unit; cattle feed yards; dairies; dry-land farming; livestock grazing; water storage; groundwater recharge areas; mineral; aggregate; and petroleum exploration and extraction; hunting clubs; wildlife preserves, farm labor housing; and public utility uses.
- **Map Code 8.4 (Mineral and Petroleum).** This designation identifies areas that contain producing or potentially productive petroleum fields, natural gas, and geothermal resources, and mineral deposits of regional and Statewide significance. The Mineral and Petroleum designation allows for mineral and petroleum exploration and extraction, including aggregate extraction; extensive and intensive agriculture; mineral and petroleum processing (excluding petroleum refining); natural gas and geothermal resources; pipelines; power transmission facilities; communication facilities; equipment storage yards; and borrow pits.
- **Map Code 8.5 (Resource Management).** This designation identifies areas that are primarily open space lands containing important resource values, such as wildlife habitat, scenic values, or watershed recharge areas. The Resource Management designation includes areas characterized by physical constraints, or may constitute an important watershed recharge area or wildlife habitat or may have value as a buffer between resource areas and urban areas. This designation also includes undeveloped, non-urban areas that do not warrant additional planning within the foreseeable future because of current population trends, marginal physical development or no subdivision activity.

Metropolitan Bakersfield General Plan (Unincorporated Planning Area)

Figure 7.10-1 shows that some KWB Lands would be governed by the *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*. The *Metropolitan Bakersfield General Plan* is a separate but interrelated land use planning program within Kern County. The boundaries of the planning area were mutually agreed upon by the City of Bakersfield and Kern County as part of the joint adoption of the *Metropolitan Bakersfield General Plan* and represent the area where planning and land use decisions could affect both Bakersfield and Kern County.¹¹ The *Metropolitan Bakersfield General Plan* was adopted by the Kern County Board of Supervisors on December 3, 2002, and was last amended on December 11, 2007.

Goal and Policy

The following goal and policy related to land use and planning from the Conservation Element of the *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)* would be applicable to KWB activities:

Goal 2: Assure that adequate groundwater resources remain available to the planning area.

- **Policy 1:** Develop and maintain facilities for groundwater recharge in the planning area.

Land Use Designations

Those portions of KWB Lands governed by the *Metropolitan Bakersfield General Plan* are designated as HC (Highway), Intensive Agriculture (R-IA), Mineral and Petroleum (R-MP), and Open Space (OS). The general plan describes these land use designations as follows:

- **Highway Commercial (HC).** This designation identifies areas that could provide services, amenities, and accommodations associated with the traveling public located adjacent to or in close proximity to major highways. These may include gas stations, restaurants, and motels.
- **Intensive Agriculture (R-IA).** This designation identifies areas devoted to the production of irrigated crops, or having the potential for such use.
- **Mineral and Petroleum (R-MP).** This designation identifies areas that contain producing, or potentially productive, petroleum fields and mineral deposits. This designation may also be used in combination with other designations.
- **Open Space (OS).** This designation identifies floodplains and resource management areas and allows agricultural uses.

Kern County Zoning

KWB Lands are zoned by Kern County as A (Exclusive Agriculture). The purpose of the A zoning district is to designate areas suitable for agricultural uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to nonagricultural uses. Uses in the A zoning district are limited primarily to agricultural uses and other activities compatible with agricultural uses, including:

- growing and harvesting crops;
- breeding and raising animals;
- agricultural industries, including processing, storing, packing, preserving, canning, and shipping;
- utility and communications facilities, including transmission lines and supporting towers, poles, and underground facilities for gas, water, electricity, and telephone service;
- resource extraction and energy development uses, including cogeneration facilities; steam generators; solar and wind-driven energy electrical generators; and mineral, oil, or gas exploration;
- flood control facilities;
- hunting or fishing clubs;
- managed wetlands;
- water storage or groundwater recharge facilities;
- small or large water systems; and
- wildlife or nature preserves.

7.10.3 IMPACTS AND MITIGATION MEASURES

7.10-1 Implementation of KWB activities could potentially change land use designations, thereby physically dividing an established community in the southern San Joaquin Valley portion of Kern County.

1996 – 2014

In 1995, approximately 3,034 acres of recharge ponds were constructed pursuant to the KCWA flood emergency program. From 1998 through 2002, an additional 4,290 acres were converted to shallow recharge ponds, some of which overlapped earlier constructed ponds, for a total net pond area of 7,114 acres. An additional 70 acres of ponds were constructed in 2009 for a total pond area of 7,184 acres. KWBA also constructed the KWB Canal and several wells and pump stations. Elsewhere in Kern County, outside of KWB Lands, approximately 520 acres of recharge ponds were developed as part of other groundwater storage projects.

KWBA manages KWB Lands in accordance with the KWB HCP/NCCP approved by USFWS and CDFG in 1997. The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Developed uses included farming, permanent facilities for the KWB, and commerce. Approximately 490 acres of land adjacent to I-5 are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. After 2003, development of this parcel was prohibited by the Settlement Agreement.

Implementation of the KWB activities has altered the physical use of the land; however, overall land use and designations have not changed. The operation of recharge ponds is compatible with the surrounding existing uses. No commercial, retail, office, residential, or other uses were developed, and an established community has not been divided. In addition, development of uses on KWB Lands was consistent with the KWB HCP/NCCP. KWB activities did not divide an established community.

Therefore, the impact of KWB activities from 1996 to 2014 on land use designations was ***less than significant***.

Mitigation Measures

None required.

2015 – 2030

KWBA manages KWB Lands in accordance with the KWB HCP/NCCP approved by USFWS and CDFG in 1997. The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Developed uses included farming, permanent facilities for the KWB, and commerce. Approximately 490 acres of land adjacent to I-5 are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. After 2003, development of this parcel was prohibited by the Settlement Agreement.

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited whereas the locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

It is also anticipated that at least an additional 500 acres of ponds would be developed as part of other groundwater storage facilities in Kern County. Construction of recharge ponds and associated berms

could alter land use patterns. However, the land use designations would not change and the recharge ponds would be compatible with the surrounding uses. No commercial, retail, office, residential, or other uses that would support population have been designated, and an established community has not been divided. KWB activities would not divide an established community.

Therefore, the impact of KWB activities from 2015 to 2030 on land use designations would be ***less than significant***.

Mitigation Measures

None required.

7.10-2 KWB activities could potentially conflict with adopted general plan policies, land use designations, and zoning codes.

1996 – 2014

Construction of KWBA facilities occurred in areas designated by the *Kern County General Plan* as Intensive Agriculture and Mineral and Petroleum and in areas designated by the *Metropolitan Bakersfield General Plan* as Highway, Intensive Agriculture, Mineral and Petroleum, and Open Space. The entirety of KWB Lands is zoned by Kern County as A (Exclusive Agriculture).

No agricultural lands were converted to nonagricultural uses within KWB Lands. Groundwater recharge facilities, including conveyance structures, are allowable land uses under the Intensive Agriculture, Mineral and Petroleum, and Open Space land use designations. In addition, construction of groundwater recharge facilities is a permitted use within the A zoning district.

Approximately 490 acres of land adjacent to the east side of I-5 are designated by the *Metropolitan Bakersfield General Plan* as Highway, which identifies areas that could provide services, amenities, and accommodations associated with the traveling public located adjacent to or in close proximity to major highways. Since 2003, the Settlement Agreement prohibits development of this parcel; therefore, the 490-acre parcel remained undeveloped vacant land.

KWBA facilities were consistent with *Kern County General Plan* Policy 10 and *Metropolitan Bakersfield General Plan* Policy 1, both of which support development of groundwater recharge facilities. In addition, KWBA facilities did not change or hinder oil and gas extraction, recreational activities (hunting, birdwatching, and nature hikes), or habitat management activities associated with the KWB HCP/NCCP on KWB Lands.

For the reasons described above, KWB activities did not conflict with *Kern County General Plan* and *Metropolitan Bakersfield General Plan* policies or result in inconsistencies with land use designations or the Kern County zoning of KWB Lands.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to conflict with adopted general plan policies, land use designations, and zoning codes was ***less than significant***.

Mitigation Measures

None required.

2015 – 2030

KWBA is proposing to construct additional recharge ponds, wells, and ancillary facilities within KWB Lands between 2015 and 2030. Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing IRWM program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited whereas the locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

Construction of future KWBA facilities would occur in areas designated by the *Kern County General Plan* as Intensive Agriculture and Mineral and Petroleum and in areas designated by the *Metropolitan Bakersfield General Plan* as Intensive Agriculture, Mineral and Petroleum, and Open Space. The entirety of KWB Lands is zoned by Kern County as A (Exclusive Agriculture).

No agricultural lands would be converted to nonagricultural uses within KWB Lands. Groundwater recharge facilities, including conveyance structures, are allowable land uses under the Intensive Agriculture, Mineral and Petroleum, and Open Space land use designations. In addition, construction of groundwater recharge facilities is a permitted use within the A zoning district.

Approximately 490 acres of land adjacent to the east side of I-5 are designated by the *Metropolitan Bakersfield General Plan* as Highway, which identifies areas that could provide services, amenities, and accommodations associated with the traveling public located adjacent to or close to major highways. Since 2003, the Settlement Agreement prohibits development of this parcel; therefore, the 490-acre parcel would remain undeveloped vacant land.

KWBA facilities and activities would be consistent with *Kern County General Plan* Policy 10 and *Metropolitan Bakersfield General Plan* Policy 1, both of which support development of groundwater recharge facilities. In addition, KWBA facilities and activities would not change or hinder oil and gas extraction, recreational activities (hunting, birdwatching, and nature hikes), or habitat management activities associated with the KWB HCP/NCCP on KWB Lands.

No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed for this purpose. Any new facilities not identified at this time would be required to be constructed consistent with the applicable General Plans. Therefore, no conflicts with general plan policies or inconsistencies with land use designations or zoning are expected to occur in areas beyond KWB Lands. KWB participants already have facilities in place to convey and exchange recovered water.

For the reasons described above, KWB activities would not conflict with *Kern County General Plan* and *Metropolitan Bakersfield General Plan* policies or result in inconsistencies with land use designations or the Kern County zoning of KWB Lands.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to conflict with adopted general plan policies, land use designations, and zoning codes would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. Kern County Planning Department. 2009 (September 22). *Kern County General Plan*, Land Use, Open Space, and Conservation Element. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009. Bakersfield, CA.
2. City of Bakersfield and Kern County. 2002 (December). *Metropolitan Bakersfield General Plan*. Adopted by the City of Bakersfield on December 11, 2002, and effective February 26, 2003, as per Resolution No. 222-02. Bakersfield, CA.
3. Kern Water Bank Authority. 2016. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed February 19, 2016.
4. Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). *Stockdale Integrated Banking Project Draft Environmental Impact Report*. Available: <http://www.irwd.com/images/pdf/doing-business/environmental-documents/env-documents-2015/StockdaleDEIR-Web.pdf>. Accessed May 21, 2015.
5. City of Los Angeles. 2015. Green Acres Farm. Available: http://www.lacitysan.org/biosolidsems/managing_biosolids/land_application.htm. Accessed May 21, 2015.
6. California Department of Parks and Recreation. 2015. Tule Elk State Natural Reserve. Available: http://www.parks.ca.gov/?page_id=584. Accessed May 21, 2015.
7. Kern County Raceway Park. 2016. About. Available: <http://kernraceway.com/about.htm>. Accessed February 23, 2016.
8. City of Bakersfield Recreation & Parks. 2015. Kern River Parkway & Bakersfield's Bicycle Trails. Available: http://www.bakersfieldcity.us/recreation/Kern_River_Parkway.htm. Accessed April 22, 2015.
9. City of Bakersfield Recreation & Parks. 2015. Kern River Parkway Trail map. Available: http://www.bakersfieldcity.us/recreation/pdfs/2013_Parkway_Trail.pdf. Accessed April 22, 2015.
10. Kern County Planning Department. 2009 (September 22). *Kern County General Plan*, Land Use, Open Space, and Conservation Element. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009. Bakersfield, CA.
11. City of Bakersfield and Kern County. 2002 (December). *Metropolitan Bakersfield General Plan*. Adopted by the City of Bakersfield on December 11, 2002, and effective February 26, 2003, as per Resolution No. 222-02. Bakersfield, CA.

7.11 HAZARDS AND HAZARDOUS MATERIALS (NEW)

7.11 HAZARDS AND HAZARDOUS MATERIALS (NEW)

7.11.1 INTRODUCTION

7.11.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.11 identified potential impacts to Hazards and Hazardous Materials as a result of the transfer of the Kern Fan Element. Substantial new information is presented herein, however, such that the text entirely replaces and updates text from DEIR Section 7.11 that discusses KWB activities. All other text in DEIR Section 7.11 remains unchanged.

Table 7.11-1A identifies the potentially affected environmental resources from impacts of KWB activities on Hazards and Hazardous Materials.

TABLE 7.11-1A

**IMPACTS OF KWB ACTIVITIES RELATIVE TO
HAZARDS AND HAZARDOUS MATERIALS**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Recharge pond construction and exposure of workers to hazardous materials and mosquito-borne diseases and Valley Fever	7.11-1; 7.11-2; 7.11-3; 7.11-4; 7.11-5; 7.11-6

Hazardous substances are substances which, by their nature and reactivity, have the capacity of causing harm or a health hazard during normal exposure or an accidental release or mishap, and are characterized as being toxic, corrosive, flammable, reactive, an irritant or strong sensitizer. The term “hazardous substances” encompasses chemicals regulated by both the US Department of Transportation’s (DOT’s) “hazardous materials” regulations and the U.S. Environmental Protection Agency’s (EPA’s) “hazardous waste” regulations, including emergency response. Hazardous wastes require special handling and disposal because of their potential to damage public health and the environment. A designation of “acutely” or “extremely” hazardous refers to specific listed chemicals and quantities.

Activities and operations that use or manage hazardous or potentially hazardous substances could create a hazardous situation if release of these substances occurred. Individual circumstances, including the type of substance, quantity used or managed, and the nature of the activities and operations, affect the probable frequency and severity of consequences from a hazardous situation. Federal, state, and local laws regulate the use and management of hazardous or potentially hazardous substances. Creation of human health hazards or exposure of people to existing sources of potential health hazards is considered in this section.

In general, hazards associated with the KWB activities would be related to the presence of residual agricultural chemicals, hazardous materials used as part of routine maintenance activities, fuel or waste oil storage tanks, oil and gas pipelines, wildfires, and vector populations.

During public review of the Notice of Preparation for the Monterey Plus EIR, interested parties submitted no comments related to hazards or hazardous materials.

For hazards related to flooding or water quality impacts associated with known groundwater contaminants, refer to Section 7.2, Surface Water and Groundwater Quality. For geologic hazards, refer to Section 7.8, Geology, Soils, and Minerals. For hazards related to public services, refer to Section 7.14, Public Services.

7.11.1.2 Analytical Method

The assessment of project impacts related to hazards and hazardous substances was conducted in accordance with standard professional practices. Factors considered in the analysis include the potential for exposure of humans to unidentified hazardous substances in soils during KWB-related construction activities, such as for recharge ponds and related facilities.

The following documents were reviewed to describe the environmental setting as it existed in 1995:

- Final EIR for the Artificial Recharge, Storage and Overdraft Correction Program, Kern County, California (Kern Water Bank) (December 1986).
- KWB First Stage Kern Fan Element Draft Supplemental EIR (December 1990).

- *Initial Study and Addendum to Monterey Agreement EIR of the Kern Water Bank Authority Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan (1997 Monterey IS and Addendum)*(see Appendix 7-6a).

The following documents were reviewed to describe the environmental setting as it existed in 2014:

- Environmental Data Resources (EDR) *Data Map Area Study Report, Kern Water Bank* (April 2015).¹
- A California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) database query for District 4.²
- A State Water Resources Control Board (SWRCB) Geotracker database query for sites within KWB Lands.
- Hazardous Waste and Substances Site List (the “EnviroStor” database) for sites within KWB Lands.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to hazards and hazardous materials, to the extent that they apply, presented in the 1997 Monterey IS and Addendum (see Appendix 7-6a).

7.11.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, as well as review of applicable background information relating to hazards and hazardous materials. For the purposes of this REIR, impacts related to hazards and hazardous materials would be considered significant if the KWB activities would:

- create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment or through the routine transport, use, or disposal of hazardous materials;
- 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;
- create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, including third-party oil and gas activities;
- 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; or
- cause a significant increase in vector populations or the likelihood of airborne/waterborne disease or illness.

The following topics are not discussed further in this REIR because no impact would occur with regard to these potential impacts:

- The nearest school, Tupman Elementary School in the Elk Hills School District, is located 0.5 mile southwest of the southwestern boundary of KWB Lands. No schools are currently being proposed within one-quarter mile of KWB Lands. Therefore, there would be no impact related to schools.

- The two closest airports are Meadows Field Airport, located approximately 11 miles northeast of KWB Lands, and Elk Hills–Buttonwillow Airport, located approximately 13 miles to the northwest. KWB Lands are located within the vicinity of a private airstrip; the Joe Gottlieb Field is located 2.3 miles northeast of KWB Lands. However, the private airfield is currently not in operation. Therefore, there would be no impact related to airports and airstrips.
- KWB activities would not physically interfere with an adopted emergency response plan or emergency evacuation plan.

7.11.2 ENVIRONMENTAL SETTING

The setting with respect to hazards or hazardous materials is the current KWB Lands and adjacent sites. In particular, areas with past or future construction activities or recharge ponds, and their proximity to known hazardous sites, are discussed.

7.11.2.1 Physical Setting in 1995

Prior to the California Department of Water Resources' (Department's) purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation. The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. The KFE property included a number of agricultural wells and conveyance facilities that had been constructed primarily to deliver irrigation water for the agricultural activity occurring then and historically on the property. A Memorandum of Understanding was signed between the Department and Kern County Water Agency (KCWA) on March 25, 1987, that provided for the phase-out of all agricultural production on the KFE property by the end of 1993. In fact, one of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE property. In 1995, under the KCWA flood emergency program (see Section III.B in Revised Appendix E) and prior to the formation of the Kern Water Bank Authority (KWBA), KCWA and the other future participants of the KWBA constructed 3,034 acres of recharge ponds.

Before the KFE property was transferred to KCWA, the Department managed the KFE property by:

- performing demonstration studies and exploratory investigations for the potential development of the KFE property as a water banking facility; and
- controlling weeds, dust, trespassers, and vandalism.

Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services, Inc., had a residence and an equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property.

The hazards and hazardous materials setting for the KFE property was described in the 1990 Supplemental EIR for the first stage of the KWB project, which described the results of soil sampling done throughout the KFE property to characterize potential contamination. Pesticides, herbicides, and other contaminants were found in soil samples near some of the pond sites, with isolated pockets of petroleum compounds found near oil pipelines or facilities.³ In addition, the 1990 Supplemental EIR for the first stage of the KWB identified mitigation measures in the form of further testing and monitoring of the soil and groundwater in the area of the recharge ponds to prevent future contamination of groundwater or potential for release of contaminants.⁴

Past Pesticide/Herbicide Use

The KFE property was actively farmed for 20-40 years prior to all agricultural activities ceasing operations in 1991. Several pesticide mixing and storage facilities were previously present on KFE property.⁵ During early investigations by the Department, past pesticide usage was assessed.⁶ Soil and groundwater sampling performed by the Department in 1990 revealed the presence of several pesticides on the KFE property, including ethylene dibromide (EDB), toxaphene, eptam s-ethyl dipropyl (thiocarbamate) or EPTC, and diuron.⁷ Subsequent soil and groundwater site investigations detected residual concentrations of these contaminants in groundwater at or slightly above their respective maximum contaminant levels (MCLs).

EDB is a chemical that is slightly water soluble and will sink to the bottom of lakes and aquifers. It is not prone to bacterial degradation, but may be decomposed by sunlight and under non-complete combustion.

Toxaphene is slightly water soluble and will sink to the bottom of lakes and aquifers. Toxaphene does not readily biodegrade, leading to persistence in the environment for extended periods of time. It is very soluble in hydrocarbons, thus oil pipeline spills on surface soil or aquifers contaminated with hydrocarbons will solvate and carry Toxaphene to new locations.

EPTC is highly water soluble and readily floats on top of the water table. It is highly volatile and once applied, 20 percent of the product evaporates within three days. The chemical readily biodegrades⁸ by bacteria and a sprayed application on soil or weeds may be completely decomposed within three weeks.

Diuron is partially water soluble and will sink to the bottom of lakes and aquifers. Dilution products of less than 7 percent solution of Diuron are used for weed management and control.

Oil and Gas Production

Kern County is the largest oil producer in California. Oil and gas production has occurred in Kern County since the early 20th century and has occurred on KFE property since the 1930s.⁹ Oil and gas wells within the vicinity of the KFE property were typically drilled to depths of 8,000-9,000 feet below the ground surface.¹⁰ Activities on the KFE property included drilling and operating oil and gas wells, use of sumps and injection wells for disposal of brine water from drilling activities, and on-site storage of petroleum hydrocarbons. Brine disposal activities may have impacted groundwater quality. These areas are further discussed in Section 7.2, Surface Water and Groundwater Quality.

Results of investigations in the early 1990s by the Department indicated that an extensive network of pipelines associated with oil and gas activities traversed the property, some of which were reported at the time to have leaked.¹¹ By 1995, numerous petroleum companies operated on and around the KFE property.

Areas of Potential Environmental Concern

At the time of transfer of the KFE property to KCWA, several Areas of Potential Environmental Concern associated with past uses of the property and known contamination remained. These areas included:

- Buena Vista Ranch Headquarters, a previous farm headquarters containing several houses, sheds, tanks, and shop buildings;
- HSST Ranch Headquarters, with containers and an old boxcar containing various hazardous chemicals;

- S&M Farms, a facility used to store and mix pesticides and store and refuel equipment;
- Tumbleweed Farms, a facility used for equipment storage and repair;
- various sites with underground, aboveground, and mobile storage tanks containing various hazardous chemicals;
- areas of contamination associated with oil and gas activities, including sumps; and
- areas of dumping of potentially hazardous waste.

7.11.2.2 Changes in Physical Setting between 1996 and 2014

The KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates soils of the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to larger diameter (>36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

From 1998 through 2002, KWBA constructed an additional 4,290 acres of recharge ponds, some of which overlapped earlier constructed ponds, for a total net pond area of 7,114 acres. An additional 70 acres of ponds were constructed in 2009 for a total pond area of 7,184 acres. Of this total, 4,998 acres of the recharge ponds constructed are located within the Recharge Sector and 2,186 acres are located within the Farming Sector.

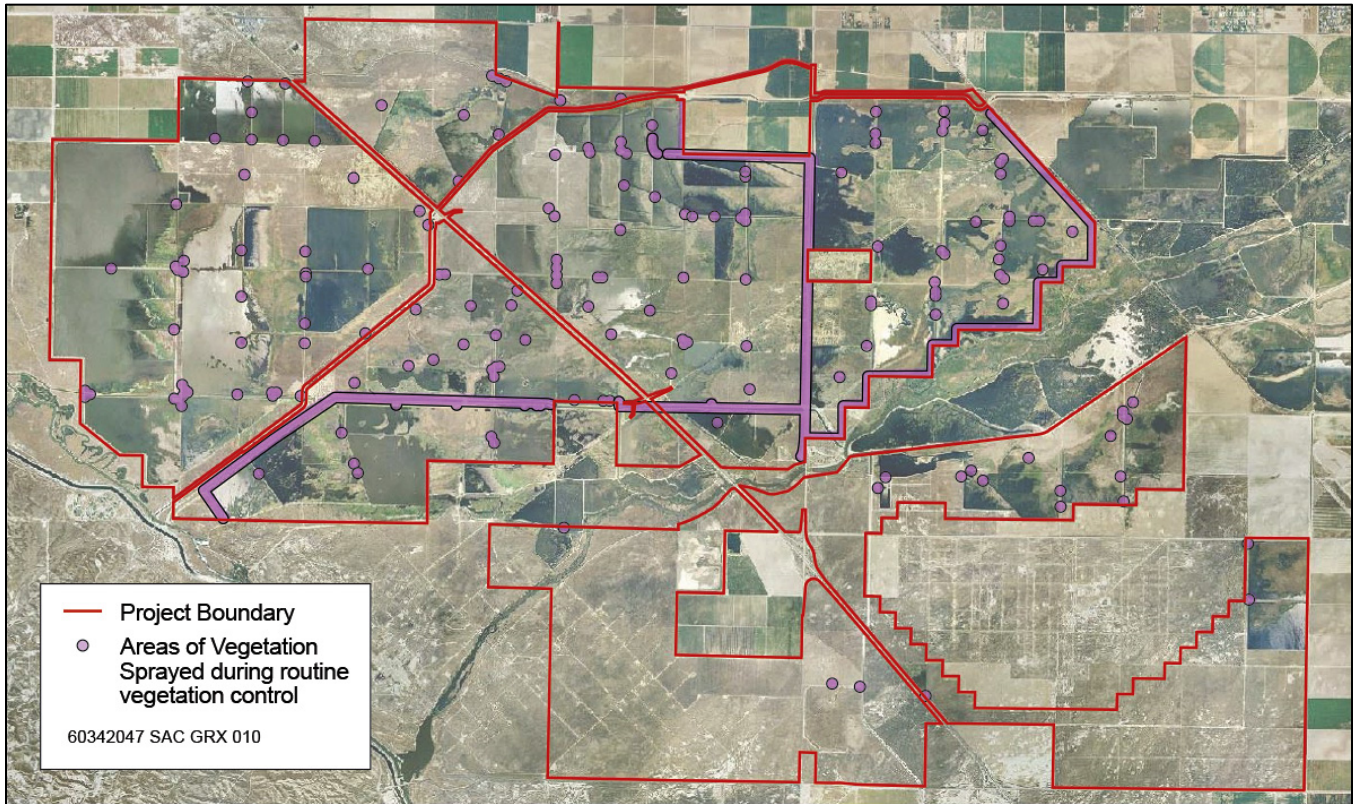
Between 1996 and 2014, maintenance and operational activities included replacing recovery wells and servicing and maintaining wells involved in groundwater recovery. Periodic berm repair and mowing of the KWB Canal banks to control excessive vegetation growth were ongoing maintenance activities. Other management activities included trash cleanup and removal of illegally dumped materials, environmental cleanup, and monitoring of third-party operations and cleanup activities.^{12,13,14,15,16,17,18}

Pesticide/Herbicide Use

Following the transfer of the KFE property, various herbicides were used on KWB Lands only in permitted areas in accordance with the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) and HCP Vegetation Management Plan (see Appendix 7-7c) to control weeds and other nuisances and with concurrence of the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS). Hand spraying of herbicides, including Diuron and Roundup, was performed along roadways, and around wells, gates, and water control structures on an annual basis.

Aerial spraying of Malathion west of KWB Lands by the California Department of Food and Agriculture to reduce beet leafhopper populations within the region was approved by KWBA in 2002.¹⁹ Spraying of Malathion was then unauthorized in 2007 by CDFG and USFWS.²⁰ The aerial spraying of Malathion near recharge ponds by truck and helicopter was performed periodically in collaboration with the Westside Mosquito and Vector Control District to reduce mosquito populations and breeding habitat.

In addition, as part of a pilot control program for cattails, aerial spraying of herbicides to stands of cattails located within recharge ponds on the western portion of KWB Lands occurred in 2006 and 2011.^{21,22} Herbicides also have been used by KWBA to control exotic and invasive plant growth at well sites, roads, and water control structures on a routine basis. Figure 7.11-1 presents areas of vegetation sprayed during routine vegetation control on KWB Lands.



Source: KWBA Annual Report 2013

Figure 7.11-1. Areas of Vegetation Sprayed During Routine Vegetation Control

Oil and Gas Production

Extensive oil and gas production has occurred in south-central California. Oil and gas production activities are found in the vicinity of KWB Lands. There are four oil and gas fields on and around KWB including: Coles Levee, North; Strand Oil Field; Ten Section Oil Field; and Canal Oil Field. The Elk Hills Oil Field is located west of KWB Lands. The Elk Hills Oil Field is the largest natural gas field and one of the largest oil fields in California.

As of 2014, there were 43,568 active oil wells in Kern County. As of March 2015, there were approximately 31 active, 152 plugged/abandoned, and 11 idle oil and gas wells located within or adjacent to the KWB Lands (see Table 7.11-2). These 31 active wells include 29 traditional oil extraction wells and 2 active water disposal wells. The oil and gas wells in the vicinity of the KWB Lands are typically drilled to depths of 8,000-9,000 feet below the ground surface (bgs).²³ The oilfields are anticipated to remain active during future water bank operations.

TABLE 7.11-2

OIL AND GAS WELLS ON KERN WATER BANK LANDS

Location	Active Wells	Abandoned Wells	Idle Wells
Canal Field	13	55	1
Coles Levee, North	10	42	10
Strand	1	23	0
Ten Section ¹⁵	7	20	0
Any Field ¹ , KWB Lands	0	12	0
TOTALS	31	152	11

Notes:
 KWB = Kern Water Bank
 1. Any Field refers to areas with wells on KWB Lands not located in a specific oil field
 Source: California Department of Conservation, Division of Oil, Gas and Geothermal Resources, March 2015²⁴

There are no active oil and gas wells located in the footprint of existing recharge basins. A total of 20 plugged/abandoned oil and gas wells are located within the footprint of existing recharge basins (see Table 7.11-3 and Figure 7.11-2). DOGGR regulates the compliance of abandoned wells on KWB Lands.

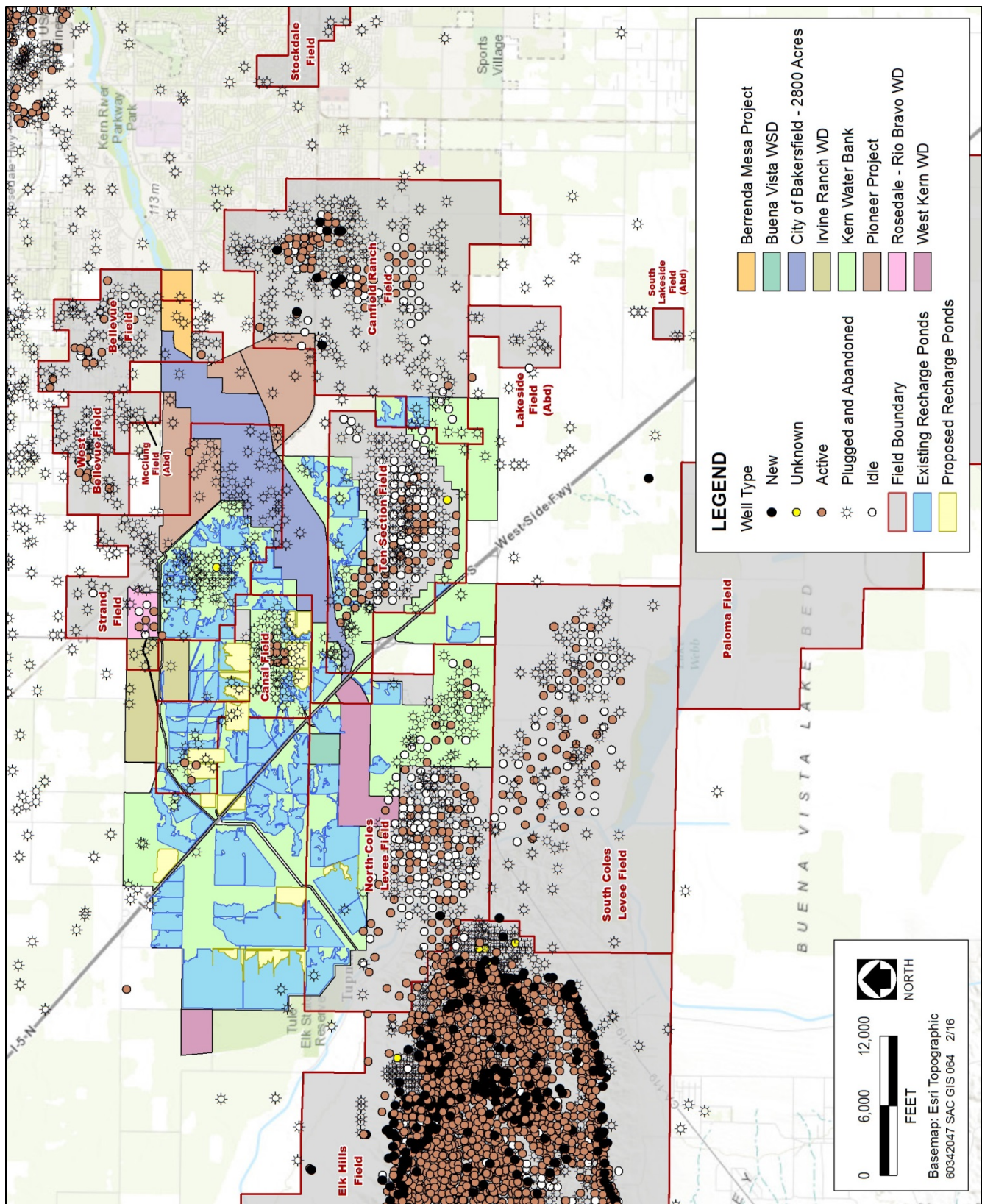
TABLE 7.11-3

ABANDONED OIL AND GAS WELLS WITHIN FOOTPRINT OF EXISTING KERN WATER BANK RECHARGE PONDS

KWB Recharge Pond #	Well #	Field Name	Status
C3	25-14	Canal	Plugged and abandoned—oil
E1	18X-1	Strand	Plugged and abandoned—oil
E6	1	Canal	Plugged and abandoned—oil
J3	88X-19	Ten Section	Plugged and abandoned—oil
J3	E-1	Ten Section	Plugged and abandoned—dry hole
J5	374-24	Ten Section	Plugged and abandoned—oil
K2	56X	East of Ten Section	Plugged and abandoned—dry hole
K2	76-28	East of Ten Section	Plugged and abandoned—dry hole
K2	66X-28	East of Ten Section	Plugged and abandoned—oil
M10	19-1	North Coles Levee	Plugged and abandoned—oil
R4	19	Canal	Plugged and Abandoned-- oil
R6	17	Canal	Plugged and abandoned—oil
R6	20	Canal	Plugged and Abandoned-- oil
R7	25	Strand	Plugged and abandoned—oil
R7	35	Strand	Plugged and abandoned—oil
R9	66X	Strand	Plugged and abandoned—dry hole
S7	32-10	Canal	Plugged and abandoned—dry hole
S10	51	Canal	Plugged and abandoned—dry hole
W2	52X-24	North Coles Levee	Plugged and abandoned—oil
W5	1-13	North of North Coles Levee	Plugged and abandoned—oil

Source: California Department of Conservation, Division of Oil, Gas and Geothermal Resources, March 2015²⁵, KWB Board Map, Sanberg 2015

Operators associated with the active oil and gas production wells presented in Table 7.11-2 include Target Drilling; Grayson Services, Inc.; San Joaquin Facilities Management, Inc.; Central Resources Inc.; Crimson Resource Management Corp.; and Glendale Oil Company.²⁶ Both Target Drilling (Well 356-24) and Grayson Services, Inc. (Well 12) operate active water disposal wells associated with its production operations.²⁷ Records for both wells indicate waste disposal at approved depths below 2,400 feet.²⁸



Source: DOC 2014 (Wells and Fields)

Figure 7.11-2. Oil Fields and Associated Wells Located within Kern Water Bank Lands and Vicinity

Enhanced Oil Recovery Wells/Disposal Wells

Senate Bill (SB) 4, effective January 1, 2015, requires oil and gas well operators to submit notification of well stimulation treatments and various types of data associated with well stimulation operations, including chemical disclosure of well stimulation fluids, to DOGGR. Written approval from DOGGR is required before any subsurface injection associated with oil or gas production can begin.

In approving a well-stimulation treatment permit, DOGGR requires as a condition of approval that the applicant install a barrier to prevent any leaks or spills from reaching the soil at well site pads.²⁹

Based on a review of available DOGGR data, no active well stimulation is occurring in the Strand, Ten Section, or Canal Oil Fields. Two wells operated by Central Resources Inc. in the Coles Levee, North Oil Field (Well 83-29 and Well 32-30) were identified at locations outside of KWB lands to the southwest. Well 32-30 is located approximately 1,500 feet south of KWB Lands and Well 83-29 is located approximately 2,000 feet south of the southern boundary of KWB Lands. Sampling of the nearest groundwater recovery wells is required as part of compliance for well stimulation activities. Central Resources, Inc. will sample existing KWB recovery well 19R-1 and West Kern Water District wells 28E-04 and 2-02 as part of the monitoring program.

During oil and gas production, brines are brought to the surface with the petroleum. The brines are re-injected into the petroleum bearing zones for disposal purposes. Annual mechanical integrity tests are performed to confirm that oil field brines have not contaminated overlying freshwater aquifers.

Hazardous Materials Sites

Hazardous sites within a 1-mile radius of KWB Lands were identified for analysis and then separated by their respective environmental databases. These databases are described briefly below.

- **Cortese List:** Sites on the Cortese List are designated by the SWRCB Leaking Underground Storage Tank program, the California Department of Resources Recycling and Recovery, and the California Department of Toxic Substances Control (DTSC) (CALSITES).
- **RCRA-SQG:** The database includes selective information on sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), and include small-quantity generators (SQGs) that generate between 100 and 1,000 kilograms of hazardous waste per month.
- **SLIC:** The Spills, Leaks, Investigations and Cleanup (SLIC) program is designed to protect and restore water quality from spills, leaks, and similar discharges.
- **LUST:** The Leaking Underground Storage Tank (LUST) incident reports contain an inventory of reported leaking underground storage tank incidents. Data are from the SWRCB's LUST Information System.
- **VCP/EnviroStor:** The EnviroStor database lists potential or confirmed hazardous-substance-release properties that were included in the old CALSITES database. In 1996, the California Environmental Protection Agency (Cal-EPA) reevaluated and significantly reduced the number of sites in the database. This database is no longer updated by the state agency but by local agencies. VCP contains low-threat-level properties with either confirmed or unconfirmed releases.
- **AST:** A listing of the locations of aboveground storage tanks (ASTs) used to store petroleum.
- **WMUDS/SWAT:** The Waste Management Unit Database (WMUDS) is used by SWRCB staff and the regional water quality control boards (RWQCBs) for program tracking and inventory of

waste management units. Solid Waste Assessment Test (SWAT) programs and reporting occur within the WMUDS database.

- **UST:** The Underground Storage Tank (UST) database contains registered USTs. USTs are regulated under RCRA Subtitle I. Data are from the SWRCB's Hazardous Substance Storage Container Database.
- **SWF/LF:** The Solid Waste Facilities/Landfill Sites (SWF/LS) records typically contain an inventory of solid-waste disposal facilities or landfills in a particular state. Data are from the California Department of Resources Recycling and Recovery's Solid Waste Information System database.

Figure 7.11-3 presents locations of hazardous sites identified by EDR in the KWB area. Table 7.11-4 summarizes these hazardous sites.

There are three active permitted ASTs within 0.45 mile of KWB Lands. There has been no reported soil or groundwater contamination related to these ASTs. Along with the USTs listed in Table 7.11-4, there are three active permitted USTs within 0.25 mile of KWB Lands. There has been no reported soil or groundwater contamination related to these USTs.

Cleanup Activities on KWB Lands

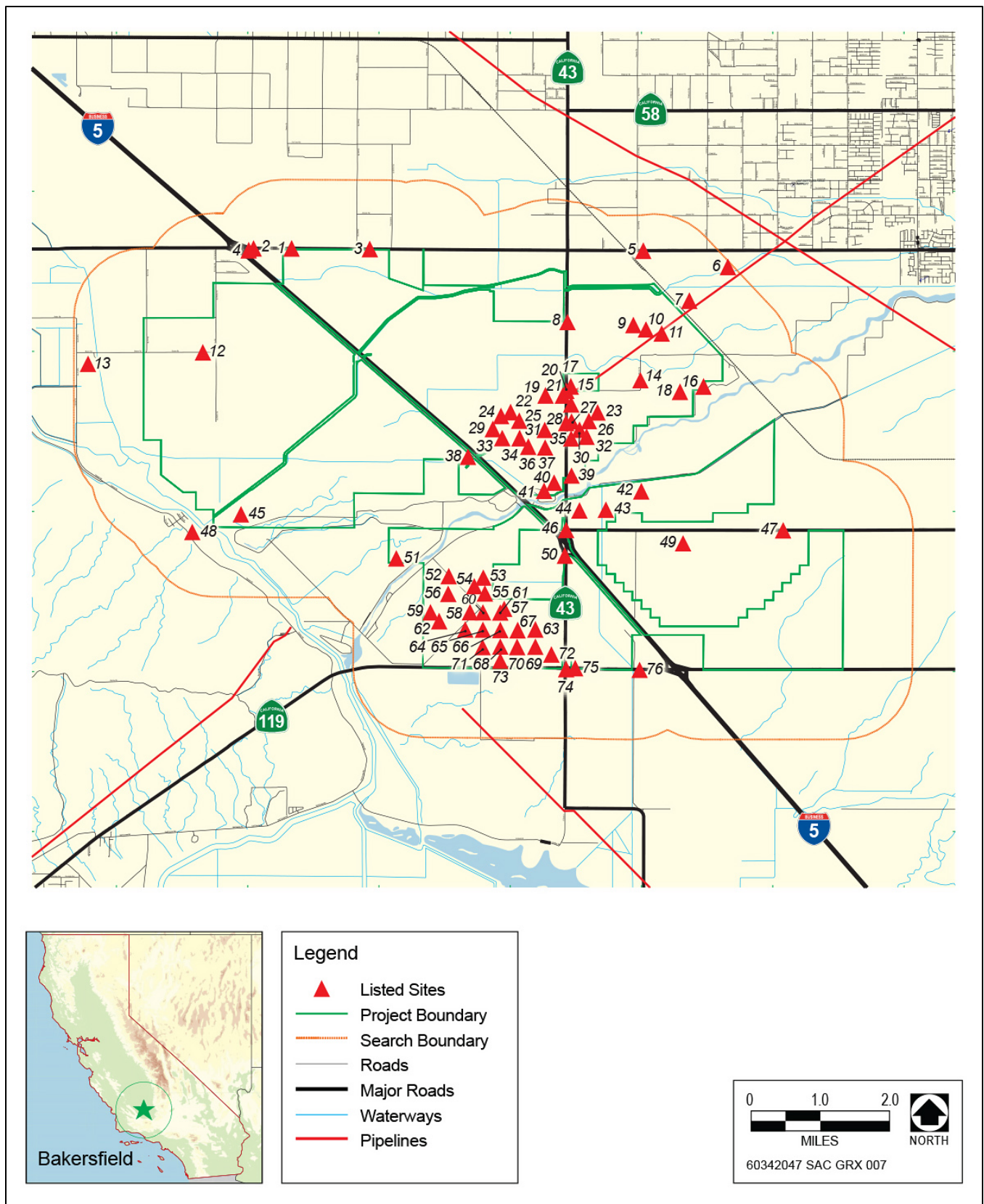
Since 1996, KWBA has tracked third-party activities, primarily oil and gas production and pipelines. In addition, KWBA entered into a Voluntary Cleanup Agreement with DTSC to cleanup contamination associated with the Buena Vista Ranch Headquarters and HSST Ranch Headquarters on KWB Lands. In 1999, cleanup activities including soil and structure removal were completed. The case was closed by DTSC with no further action on January 27, 2000.³⁰

The KWB HCP/NCCP requires that abandonment/removal projects of third-party operations comply with requirements and incorporate best management practices (BMPs), in accordance with USFWS and CDFG (now the California Department of Fish and Wildlife [CDFW]) regulations, and other State and federal agencies.

Activities that are being performed by third parties on or near KWB Lands are described below. Locations of these third-party activities can be found on Figure 7.11-4.

Rio Bravo Pump Station

The former Rio Bravo Pump Station operated as a bulk crude oil storage facility and pump station for the surrounding oil recovery operations by Chevron. The pump station connected to both the Rio Bravo-Estero pipeline and the Chevron Wait-Midway pipeline. Infrastructure associated with the pump station including pipelines, above ground oil storage tanks, burn pits, and brine ponds, has been demolished and removed. An extensive site assessment was performed by Chevron in March 1995, as requested by the Central Valley RWQCB; trenching, soil borings, groundwater monitoring well installations, and off-site sampling was conducted. Elevated levels of total dissolved solids (TDS), metals, chloride, and hydrocarbons (diesel-range) were encountered at approximate depths of surface level to 50 feet bgs. Results from an additional site investigation in 2005 suggested that contaminants appeared to be localized with little lateral or vertical movement.



Source: EDR 2015

Figure 7.11-3. Listed Hazardous Material Sites in the Vicinity of Kern Water Bank

TABLE 7.11-4

**ENVIRONMENTAL DATA RESOURCES 2015 DATABASE SEARCH RESULTS
FOR THE KERN WATER BANK AREA¹**

Location	Map ID	Site Name, Address, Description, Number	Contaminants	Media Affected	Status/Clean up Actions
Cortese List					
0.65 mile northwest of KWB Lands	4	Conoco Phillips Company 29727 Stockdale Highway Bakersfield, CA 93312 Leaking Underground storage tank LUST Cleanup Site REG. ID: 5T15000085	Total Petroleum Hydrocarbons (TPH) as gasoline	Soil	Case closed (2/3/1993)
Less than 0.25 mile to southeastern boundary of KWB Lands	46	Ten Section Pump Station Hwy 43 & Panama Lane Bakersfield, CA 93311 Leaking underground storage tank LUST Cleanup Site RB ID: 5T15000071	Total Petroleum Hydrocarbons (TPH) as crude oil	Soil	Case closed (7/16/1991)
0.65 mile southeast of KWB Lands	47	Ten Section 19263 Panama Lane Bakersfield, CA 93311 Leaking underground storage tank LUST Cleanup Site RB ID: 5T15000567	Total Petroleum Hydrocarbons (TPH) as crude oil	Soil	Case closed (12/13/1993)
RCRA-SQG					
Less than 0.25 mile to northern boundary of KWB Lands	3	WITCO Chemical CORP- CONCARB Division 27000 Stockdale Highway Bakersfield, CA 93309 DTSC Site SLIC Site EPA ID: S106486023	Small Quantity Haz Waste Generator Particulates	N/A (Permits Only)	Open since 1996 – No violations found
Less than one mile to KWB Lands	13	Chevron USA Inc. 25S Station Tupman Road Tupman, CA 93276 EPA ID: CAD000629006	Small Quantity Haz Waste Generator Particulates	N/A (Permits Only)	Open since 1996 – No violations found
Within boundary of KWB Lands	18	Chevron USA Inc. Rio Bravo Station Munzer Road Bakersfield, CA 93309 EPA ID: CAD000629352	Small Quantity Haz Waste Generator Particulates	N/A (Permits Only)	Case Closed (2002)
SLIC					
Less than 0.25 mile to northern boundary of KWB Lands	3,6	Continental Carbon Company 27000 Stockdale Highway Bakersfield, CA 93309 RB Case number: SLT5FQ049	Carbon black was produced at the site from approximately 1960 to 1980. Wastewater was disposed in ponds. EPA site screening in 1988 confirmed that contamination of groundwater was not a major concern.	Groundwater	Open-Inactive as of 1987
Within boundary of KWB Lands	7	Chevron Pipeline/Wait-Midway T30S, R26E, Section 6 Bakersfield, CA 93309 Cleanup program site RB Case number: SL205234273	Total Petroleum Hydrocarbons (TPH) as benzene, crude oil, toluene, diesel, gasoline, and xylene	Aquifer used for drinking water supply	Case closed (2/6/2013)

TABLE 7.11-4

**ENVIRONMENTAL DATA RESOURCES 2015 DATABASE SEARCH RESULTS
FOR THE KERN WATER BANK AREA¹**

Location	Map ID	Site Name, Address, Description, Number	Contaminants	Media Affected	Status/Clean up Actions
Less than 0.25 mile within boundary of KWB Lands	14	Uhler Fire Fighting Facility, Munzer Road Bakersfield, CA 93311 Cleanup program site EPA ID number: S109118057 RB case number: 2050336	Tetrachloroethylene (PCE), trichloroethylene (TCE), Arsenic, Chromium, Lead, Crude Oil, Benzene, Toluene, Ethylbenzene, and Xylenes	Under Investigation	Open-Verification Monitoring as of 2013
Within boundary of KWB Lands	38	KWB T30S, R25E, Section 15 Tupman, CA 93276 UST release EPA IS: S106486178	Crude Oil	Soil	Case Closed (8/29/2015)
LUST					
0.45 mile to northwestern boundary of KWB Lands	2	Former Shell Station 29645 Stockdale Highway Bakersfield, CA 93312 RB Case number: 5T15000891	Total Petroleum Hydrocarbons (TPH) as gasoline	Soil	Case Closed (6/18/2008)
Less than 0.25 mile to southern boundary of KWB Lands	74	South Coles Levee #10 T31S, R25E, Section 10 Bakersfield, CA 93311 LUST Cleanup Site RB Case number: 5T15000283	Gasoline	Aquifer used for drinking water supply	Case Closed (10/17/1992)
VCP/EnviroStor					
Less than 0.25 mile to southeastern boundary of KWB Lands	49	Kern Water Bank Authority Voluntary Cleanup Order	Potential COC Pesticides; Other Organic Solids.	Soil	Case Closed (1/27/2000)
WMUDS					
Less than 0.5 mile to northeastern boundary of KWB Lands	5	Stockdale Site/Hondo Chemical, Inc. 20807 Stockdale Highway Bakersfield, CA 93303 SWF/LF ID: S106832686	Processed waste; high concentrations of, e.g., BOD, Hardness, and Chloride. Manageable hazardous wastes (e.g., inorganic salts and heavy metals) are included.	Water Quality	Case Closed (4/20/1998)
Less than 0.5 mile to southwestern boundary of KWB Lands	45	Elk Hills School District 1006 Kern Street Tupman, CA 93276 WMUDS/SWAT HIST UST Site UST number: U001583281	Category C solids waste; influent or solid wastes such as BOD, Hardness, TRF, and Chloride. Manageable hazardous wastes (e.g., inorganic salts and heavy metals) are included. UST fuels are diesel and gasoline.	Water Quality, minor threat	Case Closed (12/3/1990)
UST					
Less than 0.25 mile to western boundary of KWB Lands	12	Tule Elk Reserve 28577 Station Road Buttonwillow, CA 93206 UST Number: U001580905	UST Leak/Closure, minor threat	Soil	Case Closed (4/25/1990)
SWF/LF					
Less than 0.5 mile to southwestern boundary of KWB Lands	48	Tupman Burn Dump NW/D, NE/4, T30S, R24E, Section 25 Solid Waste Disposal Site ID: S106079117	Unhealthy air emissions; organic hydrocarbons and gases. Particulates	Vapor	Case Closed (1971)

TABLE 7.11-4

**ENVIRONMENTAL DATA RESOURCES 2015 DATABASE SEARCH RESULTS
FOR THE KERN WATER BANK AREA¹**

Location	Map ID	Site Name, Address, Description, Number	Contaminants	Media Affected	Status/Clean up Actions
Within boundary of KWB Lands	72	Arco Coles Levee Disposal Site north of Hwy 119 between Highway 43 and Elk Hills Tupman, CA	Unhealthy air emissions; organic hydrocarbons and gases.	Soil/Ground water/Vapor	Case Closed (12/31/1979)
Various – Plugged Wells		The following are the Map IDs of EDR wells that are listed as plugged: 9-11,15, 16, 19-23, 25-27, 29, 30, 32-37, 39-42, 44, 53-55, 57-69, 71, 73			
Various – Active or Idle Wells		The following are the Map IDs of EDR wells that are active or idle: 24, 31, 43, 51, 52, 56, 70			
Various		The EDR Report also listed four other sites which were not near KWB Lands and/or produced no contaminants: a farm (8), a light pole accident (17), an engineering building (28), and an abandoned mine (50).			
<p>Notes:</p> <p>AST = aboveground storage tank; BOD = biochemical oxygen demand; COC = chemical of concern; EMI = emissions inventory data; DTSC = California Department of Toxic Substances Control; EPA = United States Environmental Protection Agency; KWB = Kern Water Bank; LUST = Leaking Underground Storage Tank; RCRA-SCG = Resource Conservation and Recovery Act small-quantity generator; RWQCB: Regional Water Quality Control Board; SLIC = Spills, Leaks, Investigations, and Cleanup; SWF/LF: Solid Waste Facilities/Landfill Sites; SWRCB = State Water Resources Control Board; VCP = voluntary cleanup priority; WMUDS = Waste Management Unit Database</p> <p>1. 181 orphan listings were found in the Environmental Data Resources report. Of these, 174 were found beyond the 1 mile radius study area, two were duplicates of sites listed in this table, and four were closed before 2008. Closed orphan sites are not in or immediately adjacent to KWB recharge ponds (current and proposed).</p> <p>Source: Environmental Data Resources, 2015³¹</p>					

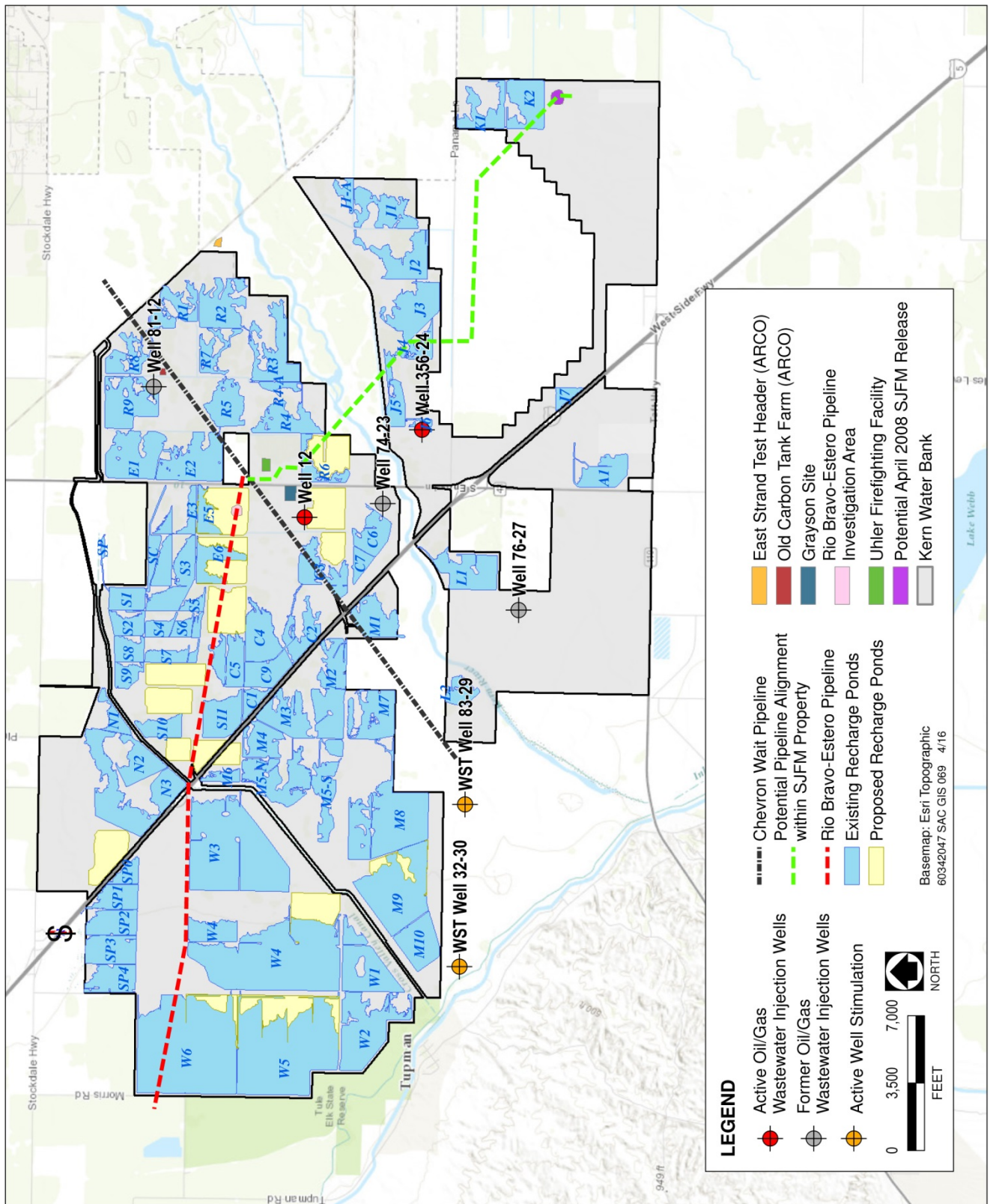
Chevron performed groundwater monitoring semi-annually from 1999-2007. Monitoring results in 2007 indicated that the contaminant concentrations had reached below action levels. Eleven monitoring wells were subsequently decommissioned in 2008.³²

On November 15, 2008, a No Further Action letter was issued to Chevron for the Rio Bravo pump station by the RWQCB.³³

Rio Bravo–Estero Pipeline (Chevron USA)

The Rio Bravo–Estero pipeline is owned by Chevron Pipe Line Company and is abandoned in place. Historically, the pipeline was used to carry heavy and light crude oils. The pipeline previously connected the Estero Marine Terminal in Morro Bay to the Chevron Rio Bravo pump station in Kern County.

A soil assessment performed in January 1996 by Geomatrix Consultants included 68 borings. A single sample from one boring at a depth of 25 feet showed concentrations of crude oil at 30,000 milligrams per kilogram (mg/kg). Samples above and below showed nondetect. The nearest soil boring, approximately 20 feet away, was also nondetect. This single detect sample at 25 feet bgs was considered anomalous and additional remediation was not considered necessary.³⁴ No further investigation was performed. The sample boring is located on KWB Lands but not at an existing recharge pond.



Source: Multiple Sources, Compiled by Sanberg, 2015

Figure 7.11-4. Potential Contamination Sites and Selected Oil/Gas Facilities Existing and Proposed KWB Recharge Ponds

KWBA contacted Chevron in 2001 requesting removal of the unused pipeline and was informed that it would be removed that year. In July 2009, Chevron and KWBA staff members met to discuss implementation of a pipeline assessment. In December 2010, an agreement was reached between Chevron and KWBA detailing potential removal of the pipeline should the KWBA need to use the right-of-way.³⁵ No further action appears to have occurred.

Wait-Midway Pipeline (Chevron USA)

The 32-mile-long Wait-Midway pipeline was used to carry crude oil from Chevron wells in the Strand Oil Field to the Rio Bravo pump station. In 1989, a subsurface investigation of the right-of-way that crosses the now KWB Lands was conducted. In 1996, an extensive groundwater monitoring well network was installed. Sections of the pipeline were removed in the late 1990s and any remaining portions of the pipeline are abandoned in place.³⁶ For site cleanup, Chevron used remediation by natural attenuation for soil cleanup. RWQCB concluded that petroleum constituents left in groundwater were minimal, not posing a threat to groundwater, human health, or the environment.³⁷ The Wait-Midway Pipeline site was issued a letter for no further action by the Central Valley RWQCB on February 16, 2013, and all monitoring wells were decommissioned in late 2013.³⁸

Thomas Oil Company

The Thomas Oil Company site in the Strand Oil Field on KWB Lands consisted of seven oil wells, two tank facilities, sumps, and surface lines. The facilities had compliance problems, including sumps, leaking tanks, and petroleum-stained soil. RWQCB performed an inspection in December 1999 and found two unlined sumps on the property (Sump 1 and Sump 2), one of which contained thick oil wastes (Sump 2). RWQCB subsequently issued a Notice of Violation and request for site closure in December 2000.³⁹ Soil samples from the sump sites indicated the presence of hydrocarbons at elevated levels, and RWQCB requested a remediation plan. The facility was inactive at the time. In January 2001, an investigation of the lateral extent of impacted soils was recommended at Sump 1.⁴⁰

In 2003, Thomas Oil Company went out of business and site closure responsibilities were transferred to DOGGR's orphan well/abandoned lease program. DOGGR identified the former Thomas facilities as "orphaned" and eligible for clean up by the State and set up three phases for site closure.⁴¹ KWBA assisted with biological surveys, access, and monitoring. An initial phase (Phase I) of cleanup began in 2006 and was completed in June 2007. In 2008, DOGGR secured funding for the Phase II activities and returned to abandon the remaining wells, tank farms, and flow-lines.⁴² As part of Phase II, sump closure was completed in 2012. In 2013, RWQCB determined that the degraded residual crude oil does not pose a significant threat to the underlying groundwater. The Central Valley RWQCB issued a letter for no further action on November 15, 2013.⁴³

Uhler Fire Fighting Facility

The Frank Uhler Petroleum Fire Training Facility, a training school to instruct firefighters in the suppression of petroleum fires, was in operation from 1979 to 1990. Tanks, plumbing, and towers were located onsite to give firefighting crews practice in fighting oil industry fires. The land is now owned by KWBA and all former structures have been removed.

A site investigation in 1996 discovered soil impacted by petroleum hydrocarbons. Additional investigations were completed in September 2004, February 2005, and May 2007.⁴⁴ Tetrachloroethylene (PCE), arsenic, chromium, and lead were detected above MCLs in groundwater, and trichloroethylene (TCE) was detected above regulatory limits in the soil. A remedial action plan submitted in 2008 called for excavation and remediation of impacted soils. In August 2011, approximately 10,000 tons of impacted soil were removed (from 18 to 35 feet bgs). In February 2012, Central Valley RWQCB concluded that removal and remediation of impacted soil was complete, but

groundwater monitoring needed to continue. No PCE or TCE was detected above MCLs after groundwater sampling in July 2012.⁴⁵ In addition, metals were detected but below their respective MCLs. Total petroleum hydrocarbon (TPH) as diesel was discovered above its MCL. However, as a result of low groundwater depths, monitoring has not been conducted since July 2012, but is expected to continue as groundwater levels permit.

Vintage Sump Closures - Strand Oil Field (ARCO)

In 1996, ARCO Corporate Environmental Remediation (ARCO), as part of its Vintage Subsurface Facility Removal Project, removed 17 sumps located at two former tank farms in the Strand Oil Field: Old Carbon Tank Farm (M13L2 through M13L7) and East Strand Test Header (M13L1, M13L8 through M13L17) (Figure 7.11-4). The Old Carbon Tank Farm is located on KWB Lands and the East Strand Test Header is located offsite of KWB Lands. Thirteen of those sumps were concrete and/or steel lined, and contained crude oil, wastewater, sludge, and miscellaneous debris. The four remaining sumps (M13L7, M13L8, M13L10, and M13L14) were unlined and contained dirt, wood debris, and sludge residual. Upon sump removal operations, surface soil samples collected from locations adjacent to the removed sump locations indicated that total recoverable petroleum hydrocarbons (TRPH) concentrations ranged from non-detect to 6,300 mg/kg; stained soil was not observed during sump removal.⁴⁶

In June 1997, LUFT Engineers & Environmental Consultants Inc. (LUFT) reviewed the closure procedures performed by ARCO in 1996 for the 17 sumps described above. An unlined sump (M13L8) measuring 20 feet by 40 feet had an estimated 324 cubic yards of stained soil removed. A soil sample from a depth of approximately 21 feet bgs had a concentration of 4,400 mg/kg of TRPH. The sump was closed. At the time of closure, depth to groundwater was believed to be over 100 feet bgs.⁴⁷ Two other sumps were closed with concentrations of TRPH of approximately 1,000 mg/kg. An above ground tank (M13L6) was closed with 1,000 mg/kg TRPH remaining at a depth of 10 feet bgs. An unlined dirt sump, M13L17, was closed with 1,100 mg/kg TRPH remaining at a depth of 8 feet bgs after removing approximately 10 cubic yards of stained soil.

On September 28, 2005, during replacement of equipment on Vintage well 14-7, an oil release occurred which involved impacts to areas outside the well pad that included surrounding non-native grasses and standing water in two adjacent irrigation canals. The impacted areas were scraped by a dozer and the impacted water was removed via vacuum truck and disposed of properly off-site. No subsequent additional disturbance occurred to the site.⁴⁸

In 2005–2006, Vintage abandoned four oil wells in the northeast portion of KWB Lands before transferring ownership to a subsidiary of Occidental of Elk Hills. In response to DOGGR's review of the status of the Vintage well abandonments, the new owner removed the inactive flow lines.

Target Drilling Spill Incident

Target Oil Company operates a few wells and pipelines in, generally, the south-central portion of KWB Lands. Target's activities included oil and gas production, pipeline maintenance, and well maintenance. KWBA observed an oil spill on March 2008 at Target Drilling Company's well number 320-24. The spill was due to a hose which had become loose from a scrubber tank. As the spill does not appear on EPA's Office of Environmental Stewardship Spill Records or EDR Report, it is likely the spill was less than the San Joaquin Valley reportable amount of 1 barrel (42 gallons). An investigation was performed and the spill was contained.⁴⁹ Target was involved in another incident, a well blowout, in August 2011.⁵⁰

Grayson Services, Inc.

Grayson Services, Inc. operates oil field facilities in a portion of Section 14 (Figure 7.11-4). The facility contains three concrete-lined wastewater sumps used for oil and wastewater storage. No volume of wastewater discharge or wastewater samples have been collected for these sumps and, therefore, these action items have been requested through a directive to Grayson from the Central Valley RWQCB. A Cleanup and Abatement Order (CAO) was issued to Grayson in August 2015 regarding the disposal ponds associated with their petroleum production wastewater discharge facility that is located on the site.⁵¹ The CAO is still active and ongoing.

Remediation Activities—211 Pipeline by Inergy Services

In November 2011, Inergy Services performed an internal inspection of its 6-inch 211 pipeline which was constructed in 2001 and used to transport petroleum vapor products from the Rogas Facility located off Stockdale Highway, as well as produced gas from operators along the pipeline alignment. The depth of the pipeline is unknown. The inspection was conducted to verify the integrity of the pipeline for its present usage and the possibility of converting the line to liquid service. The inspection showed the line had significant corrosion which required pipeline maintenance; Inergy Services planned to dig up the line and replace segments. The areas in question were on West Kern Water District property in Section 21-T30S-R25E. Maintenance activities were planned to begin in May 2012.⁵² Inergy Services was contacted for information regarding these activities, but it is unknown whether the planned removal and replacement was completed. A records search indicated no past release of hazardous materials to the environment from operations of this pipeline or its repair.

Inergy Services retains ownership of a 6-inch natural gas pipeline, first operated in 2001, that is located in Section 21-T30S-R25E of KWB Lands. The pipeline is used primarily to transport petroleum vapor products to the Rogas Facility. The 211 natural gas pipeline is located less than a mile from existing recharge ponds. However, a records search indicates no release of hazardous materials to the environment from this pipeline. The future role for the Inergy Services 211 pipeline indicates plans to use it to convey liquefied natural gas. No future recharge ponds would be located within the pipeline right-of-way. Therefore, construction, recharge, and recovery at these ponds would be unaffected by the operation of this pipeline.

Continental Carbon Company

This site is located on the northernmost border of KWB Lands on Stockdale Highway. Carbon black, a material created from the incomplete combustion of petroleum products, was produced at this site from approximately 1960 to 1980.⁵³ Wastewater was disposed to ponds when operating. EPA performed a site screening in 1988 and concluded that contamination of groundwater was not a major concern due to the immobility and insolubility of the particulates left in soil.⁵⁴ DTSC completed a site screening in 1995. As of 2013, all structures and tanks have been removed and all ponds leveled, as evidenced by the RWQCB Geotracker database listing.⁵⁵ However, the site is still listed as “Open-Inactive” on Envirostor and Geotracker databases.

Hondo Chemical (Stockdale Site)

Hondo Chemical (Stockdale Site) is located about 1,000 feet north of the northeast corner of KWB Lands. The site produces various chemicals and was listed as closed on the RWQCB Geotracker database in 1998.⁵⁶ However, in 2007, the company owner was issued a Notice of Violation by Kern County Environmental Health Services Department for incorrect handling and storage of hazardous materials.⁵⁷ In addition, county officials were concerned about Hondo Chemical’s use of water to suppress dust from fly ash stockpiles. A monitoring plan was produced and the owner was ordered to haul all fly ash stockpiles off site. As of 2011, the owner removed 35,000 tons of fly ash.⁵⁸ An October

2013 monitoring report stated that volatile organic compounds, including petroleum hydrocarbons and heavy metals, were not detected in the groundwater samples in excess of either federal or state primary or secondary MCLs. Based upon these analytical results, the report stated the groundwater aquifer beneath the site was not impacted by the operations at the site.⁵⁹ Removal of fly ash stockpiles is ongoing.

Illegal Dumping

Illegal dumping has been reported on KWB Lands in KWB Annual Reports since 2005. The materials dumped include construction waste, tires, appliances, general rubbish, and small amounts of hazardous waste. When possible, KWBA staff identifies the culprit through “leads” in the trash and contacts the responsible party to remove the material to avoid prosecution. More often, KWBA loads, hauls, and cleans up the material.⁶⁰

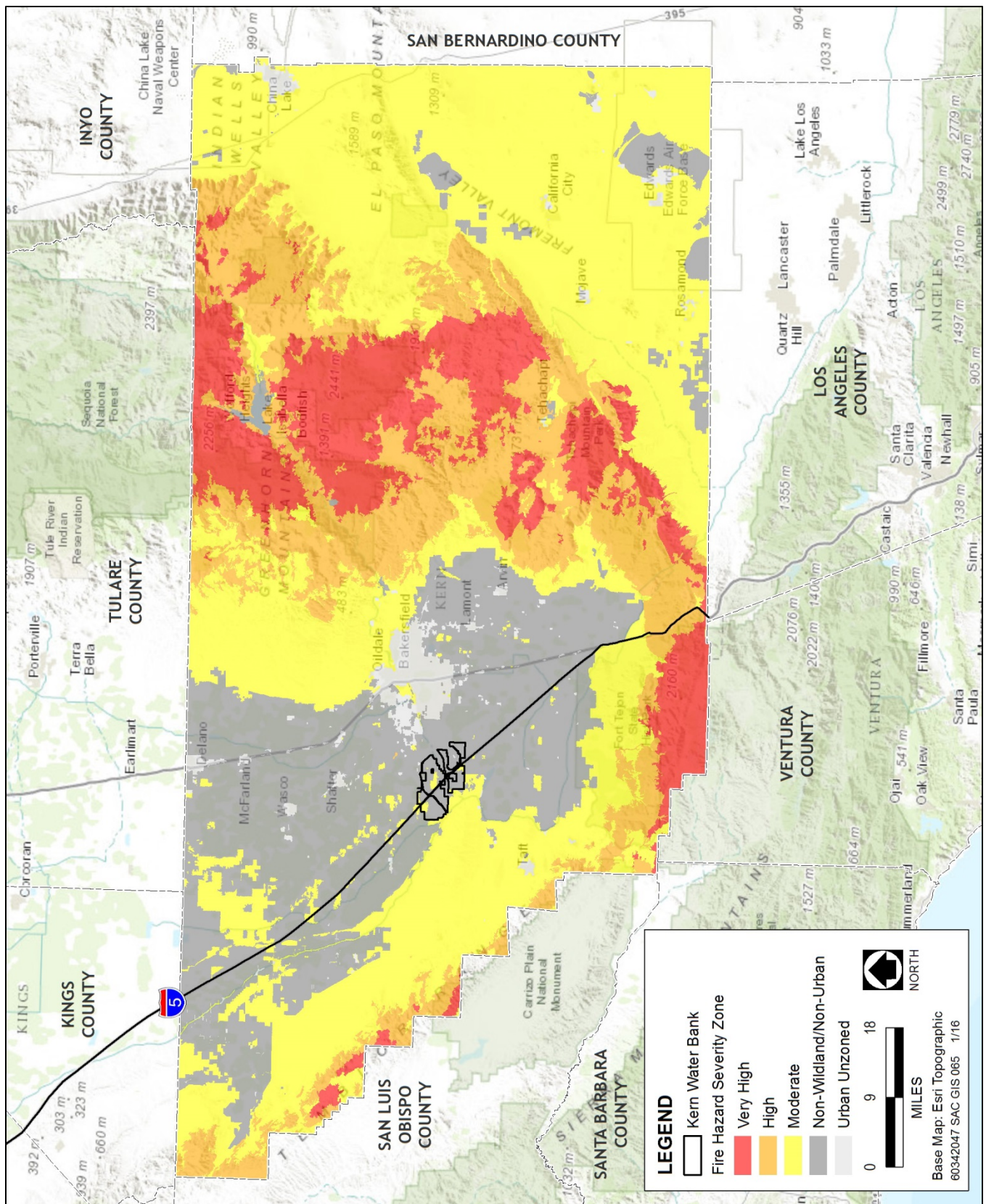
Wildfires and Fire Hazard Safety Zones

Wildland fires represent a substantial threat in the state, particularly during the hot, dry summer months. Wildland fires may be started by natural processes, primarily lightning, or by human activities. California law requires the California Department of Forestry and Fire Protection (CAL FIRE) to identify areas (zones) based on the severity of fire hazard that is expected to prevail there (Figure 7.11-5). Consequently, CAL FIRE has established a fire hazard severity classification system to assess wildland fire potential.⁶¹ The fire hazard severity classification system identifies zones, depicted on CAL FIRE maps, which take into account potential fire intensity and speed, production and spread of embers, fuel loading, topography, and climate (e.g., temperature and the potential for strong winds).

The fire hazard classification system provides three classes of fire hazards: Moderate, High, and Very High. Wildland fire protection in California is the responsibility of either the State, local government, or the federal government. State Responsibility Areas (SRAs) includes those areas where the financial responsibility of preventing and suppressing fires falls primarily on the State; incorporated cities and federal ownership are not included. Local Responsibility Areas (LRAs) include incorporated cities, cultivated agriculture lands, and portions of the desert. LRA fire protection is typically provided by city fire departments, fire protection districts, counties, and by CAL FIRE under contract to local governments. Federal Responsibility Areas are those located on federal lands not otherwise included in SRAs and LRAs.

CAL FIRE uses an extension of the SRA fire hazard severity zone model (based on amount and type of vegetative cover, beneficial water uses, probable erosion damage, fire risks, and hazards) as the basis for evaluating fire hazard in LRAs. The LRA hazard rating reflects flame and ember intrusion from adjacent wildlands and from flammable vegetation in the urban area. Most KWB Lands are classified as unzoned (unclassified fire hazard), with scattered small areas classified as moderate fire hazard severity zones. The hilly terrain to the west is classified as moderate.⁶²

As part of vegetation management on KWB Lands, prescribed burning and the grazing program are common methods used to reduce annual grasses and weeds. Prescribed burns are performed in accordance with the San Joaquin Valley Air Pollution Control District permit for agricultural burning (see Section 7.0.4.1.3. Permit conditions include fire safety procedures including properly cleaned firebreaks and adequate tools and equipment to attend to burn areas. Herbicide spraying for weed control around existing pump stations, utilities, and control structures is performed for fire protection purposes.



Source: California Dept. of Forestry and Fire Protection

Figure 7.11-5. Kern County Fire Hazard Severity Zones

Vectors and Mosquitoes

West Nile virus (WNV) is a mosquito-borne disease that is found in various parts of the world. In 1999, it was detected in the eastern United States; since then, the virus has spread throughout the United States and is well established in most states, including California.

Most people infected with WNV may have no symptoms and will not become sick. However, about 20% will become ill 3 to 15 days after being bitten by an infected mosquito. Symptoms can include: fever, headache, body aches, and mild skin rashes. Less than 1% of WNV cases lead to the more critical form of the disease.⁶³ There were 11 human cases of WNV in Kern County in 2014.⁶⁴

KWB Lands are located in California's Central Valley where Valley Fever is known to exist. Valley Fever is an infection which results from inhalation of a fungus (*Coccidioides immitis*). These fungal spores live in soil and generally are limited to areas of the southwestern United States, Mexico, and parts of Central and South America. It can be contracted only from inhalation of spores; it cannot be passed from an infected person to an uninfected person. Spores can enter the air when ground-moving activities, including natural disasters such as earthquakes or excavation activities, disturb spore-bearing soil. Approximately sixty percent of exposed people may not experience symptoms. Infection can cause flu-like symptoms, and if it is disseminated to organs other than the lungs, it can lead to severe pneumonia, meningitis, and in some cases, death.⁶⁵ There were 895 cases of Valley Fever reported in Kern County in 2014.⁶⁶

7.11.2.3 Regulatory Setting in 1995

The following describes the federal and state regulatory setting in 1995.

Federal

Many agencies regulate hazardous materials. These include federal agencies such as the EPA, the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission (NRC), DOT, and the National Institutes of Health (NIH). The following represent federal laws and guidelines governing hazardous materials prior to 1995:

- Federal Water Pollution Control Act,
- Clean Air Act,
- Occupational Safety and Health Act,
- Federal Insecticide, Fungicide, and Rodenticide Act,
- Comprehensive Environmental Response Compensation and Liability Act,
- Guidelines for Carcinogens and Biohazards,
- Superfund Amendments and Reauthorization Act Title III,
- Resource Conservation and Recovery Act,
- Safe Drinking Water Act, and
- Toxic Substances Control Act.

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous materials is the EPA, under the authority of RCRA. EPA regulates hazardous waste sites under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the Code of Federal Regulations (CFR).

State

Cal-EPA and the State's Office of Emergency Services (OES) establish rules governing the use of hazardous materials. Chemical suppliers are responsible for complying with all applicable packaging, labeling, and shipping regulations.

Applicable State laws include the following:

- Public Safety/Fire Regulations/Building Codes,
- Hazardous Waste Control Law,
- Hazardous Substances Information and Training Act,
- Hazardous Materials Release Response Plans and Inventory Act ,
- Air Toxics Hot Spots and Emissions Inventory Law, and
- Underground Storage of Hazardous Substances Act.

Within Cal-EPA, DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law. In 1993, SB 10821 assigned to Cal-EPA the authority and responsibility to establish a unified hazardous waste and hazardous materials management regulatory program (known as the Unified Program) under Health and Safety Code Chapter 6.11. The purpose of the Unified Program is to consolidate, coordinate, and make consistent, both locally and statewide, six different hazardous materials and hazardous waste regulatory programs. State regulations applicable to hazardous materials are indexed in Title 26 of the California Code of Regulations (CCR).

Local

Prior to 1995, local agencies regulated hazards and hazardous materials exercising their police powers under existing State regulations for the monitoring and enforcement of those regulations. In Kern County, the Environmental Health Services Department (EHSD) monitors new land development for environmental quality, including hazards to human health and handling of hazardous materials through its Hazardous and Solid Waste Division.

7.11.2.4 Changes in Regulatory Setting between 1996 and 2014

Federal

The regulatory setting for federal regulations is not substantially different from those that existed in the 1995 regulatory setting described previously, with the following updates:

Hazardous Materials Transportation Act

The transportation of hazardous materials and hazardous wastes, including shipping documentation, placarding and marking of vehicles, loading and unloading, incident reporting, and worker training is regulated through the California Department of Transportation from the Hazardous Materials Transportation Act, as amended and codified in 49 United States Code (USC) section 5101 et seq.

Oil Pollution Prevention

The goal of the oil pollution prevention regulation in 40 CFR Part 112 is to prevent oil discharges from reaching navigable waters of the United States or adjoining shorelines. The rule was also written to

ensure effective responses to oil discharges. The rule further specifies that proactive measures are to be used to respond to oil discharges. The oil pollution regulation contains two major types of requirements: prevention requirements (Spill Prevention, Control, and Countermeasure rules) and Facility Response Plan requirements.

Pollution Prevention Act

The Pollution Prevention Act (42 USC section 13101 et seq.) focused industry government and public attention on reducing the amount of pollution through cost-effective changes in production, operation, and use of raw materials. The Office of Pollution Prevention and Toxics manages programs under the Toxic Substances Control Act and the Pollution Prevention Act. Under these laws, EPA evaluates new and existing chemicals and their risks, and finds ways to prevent or reduce pollution before it reaches the environment. Changes applicable to KWB activities involved adjustments to the list of hazardous materials and MCLs for some of the hazardous materials regulated by the various federal agencies.

State

The regulatory setting for state hazardous materials regulations is not substantially different than those in 1995, as described previously, with the following updates:

California Code of Regulations Title 8

This CCR title contains vital safety laws and regulations regarding California's workers, trades, and workplace safety:

- Department of Industrial Relations
- Cal/OSHA
- Construction Safety Orders
- Division of Labor Standards Enforcement
- Division of Workers' Compensation
- Division of Industrial Accidents
- General Industry Safety Orders

California Code of Regulations Title 19⁶⁷

This CCR title sets standards for the prevention of fire and the protection of life and property from the Office of the Fire Marshal, the Office of Emergency Services, and the Seismic Safety Commission:

- General Fire & Panic Safety Standards
- Construction Guidelines
- Emergency Management System
- Earthquake & Fire Resistant Construction Standards

California Code of Regulations Title 22⁶⁸

This CCR title contains compliance information from the California Employment Development Department, Department of Aging, Department of Social Services, Department of Rehabilitation, and Department of Health Care Services:

- Environmental Health
- Standards for Management of Hazardous Waste

California Senate Bill 4 (Oil and Gas Well Stimulation Treatments in California)

SB-4, effective January 1, 2014 and continuing until permanent regulations are adopted, requires oil and gas well operators to submit notification of well stimulation treatments and various types of data associated with well stimulation operations, including chemical disclosure of well stimulation fluids, to DOGGR. Well stimulation treatments include but are not limited to hydraulic fracturing treatments and acid well stimulation treatments. It also mandates seismic testing and mapping, and reporting of water used and the disposition of fracking wastewater. The legislation also requires an in-depth study of well stimulation treatments in California to evaluate the hazards and risks and potential hazards and risks that well stimulation treatments pose to natural resources and public, occupational, and environmental health and safety.

California Department of Pesticide Regulation

Pesticide use is regulated by EPA and the California Department of Pesticide Regulation (CDPR). EPA sets broad restrictions on pesticide use; in general, California's laws are even more stringent than federal standards. Both federal and state laws require that pesticides be used according to their labels. Agricultural operations also require the applicator to file a detailed report on monthly pesticide use with the local county agricultural commissioner's office. County agricultural commissioners serve as the primary local enforcement agents for pesticide laws and regulations. CDPR maintains pesticide usage data reported to the county agricultural commissioner in its Pesticides Use Reporting Database.

Cortese List

The provisions of California Government Code Section 65962.5 are commonly referred to as the "Cortese List" (after the legislator who authored the legislation that enacted it). The Cortese List is a planning document used by state and local agencies to comply with CEQA requirements in providing information about the locations of hazardous-materials release sites. California Government Code Section 65962.5 requires Cal-EPA to develop an updated Cortese List annually, at a minimum. DTSC and SWRCB are responsible for a portion of the information contained in the Cortese List. Other California state and local government agencies are required to provide additional information about releases of hazardous materials for the Cortese List. CEQA requires an evaluation of whether or not a project would be located on a hazardous-materials site that is included on the Cortese List. The results of Cortese List database searches are discussed above under "Hazardous Materials Sites" in Section 7.11.2.2, Changes in Physical Setting Between 1996 and 2014.

Central Valley RWQCB

The Central Valley RWQCB is responsible for protecting the beneficial uses of surface waters and groundwater resources in the Tulare Lake Hydrological Basin. RWQCB adopted a water quality control plan (WQCP, sometimes known as the basin plan), amended in January 2004, that sets the implementation policies, goals, and water management practices in accordance with the Porter-Cologne Water Quality Control Act. The basin plan establishes numerical and narrative standards and

objectives for water quality aimed at protecting beneficial uses of surface water in the basin. The Central Valley RWQCB also enforces provisions of the state statutes that protect groundwater.

California Department of Forestry and Fire Protection

CAL FIRE is responsible for fire protection and stewardship of more than 31 million acres of California's privately owned wildlands. CAL FIRE's mission includes managing and protecting California's natural resources. CAL FIRE's firefighters, fire engines, and aircraft respond to an average of more than 5,600 wildland fires each year and oversee enforcement of California's forest practice regulations, which guide timber harvesting on private lands. CAL FIRE also provides Fire Hazard Severity Zone Maps for SRA lands and separate draft Very High Fire Hazard Severity Zone Maps for LRA lands. CAL FIRE also requires California counties to develop fire protection management plans that address potential threats of wildland fires. The Kern County Wildland Fire Management Plan identifies federal, state, and local responsibility areas for the entire county to facilitate coordination efforts for fire protection services.

Local

The regulatory setting for state hazardous materials regulations is not substantially different than those in 1995, as described previously, except for formation of local California Unified Program Agencies (CUPAs) to assist in the monitoring and emergency planning for hazardous materials release. The local CUPAs formed after 1995 are the Kern County EHSD and the City of Bakersfield Fire Department (Metropolitan Bakersfield Area). General Plans developed by the CUPAs formulate the strategy used to administrate projects within their jurisdiction.

Kern County General Plan

The following goal from the Circulation Element of the *Kern County General Plan* would be applicable to KWB activities:

Transportation of Hazardous Materials

Goal 1: Reduce risk to public health from transportation of hazardous materials.

Metropolitan Bakersfield General Plan

The following goals and policies from the Conservation Element of the *Metropolitan Bakersfield General Plan* would be applicable to KWB activities:

Conservation/Minerals

Goal 3: Avoid conflicts between the productive use of mineral and energy resource lands and urban growth.

Goal 4: Protect land, water, air quality and visual resources from environmental damage resulting from mineral and energy resource development.

- **Policy 11:** Prohibit incompatible development in areas which have a significant potential for harm to public health, safety and welfare due to mineral and petroleum extraction and processing.
- **Policy 12:** Design resource extraction operations subject to discretionary permits to maintain the integrity of areas of "high environmental quality" and unique scenic value.

Kern County Hazardous Materials Area Plan

The Kern County Hazardous Materials Area Plan is a document created by the Kern County Environmental Health Services Department (KCEHSD) that regulates businesses which deal in creation, transport, or disposal of hazardous wastes. The disclosure program requires handlers of hazardous materials and waste to develop Hazardous Materials Business Plans (business plans) and submit electronically through the California Environmental Reporting System (CERS) to KCEHSD. Handlers must also submit reports of spills or incidents depending on specific standards set by Kern County.⁶⁹

7.11.3 IMPACTS AND MITIGATION MEASURES

7.11-1 KWB construction activities could potentially expose workers or the public to previously unidentified hazards or hazardous materials.

1996 — 2014

The construction of KWB facilities resulted in ground-disturbing activities that could have exposed construction workers to residual chemicals by inhaling fugitive dust emissions associated with past agricultural practices involving the use of pesticides, fungicides, and similar agricultural products on crops and soils.

Residues of agricultural chemical products in farmed soils as a result of routine agricultural operations are not typically managed as hazardous waste when used in accordance with adopted laws and regulations. Nonetheless, individuals performing excavation and grading activities would be at a greater risk of exposure to agricultural chemical residues in soil through inhalation of fugitive dust emissions from soil movement. Construction of the ponds would also involve the use of heavy equipment that would contain fuels and lubricants. These products contain hazardous compounds, and an accidental release of these materials could injure construction workers, contaminate soil or water, or present a fire/explosion hazard.

Construction contracts included specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels. Title 8 of the CCR also addressed the use of hazardous products in the work environment, which would apply to construction contractors. The potential for inadvertent spills of materials, which could affect nearby surface water bodies or groundwater, was managed through National Pollutant Discharge Elimination System (NPDES) construction site BMPs and measures included in the KWB HCP/NCCP Vegetation Management Plan (Appendix 7-7c). The 1997 Monterey IS and Addendum (Appendix 7-6a) also included a requirement that pesticides be used in accordance with the KWB HCP/NCCP Vegetation Management Plan. No known exposure of hazards or hazardous materials to workers or the public were documented during KWB construction or operation activities from 1996 through 2014.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to exposing workers or the public to previously unidentified hazards or hazardous materials was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with the KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed. Maintenance of existing and new basins, wells, and ancillary facilities would also take place.

The construction of recharge ponds would result in ground-disturbing activities that could expose construction workers to residual chemicals associated with past agricultural practices involving the use of rodenticides, pesticides, fungicides, and similar agricultural products on crops and soils. Residues of agricultural chemical products in farmed soils as a result of routine agricultural operations are not typically managed as hazardous waste when used in accordance with adopted laws and regulations. Nonetheless, individuals performing excavation and grading activities would be at a greater risk of exposure to agricultural chemical residues in soil through inhalation of dust from soil movement. Construction of the ponds would also involve the use of heavy equipment that would contain fuels and lubricants. These products contain hazardous compounds, and an accidental release of these materials could injure construction workers, contaminate soil or water, or present a fire/explosion hazard. Current land management practices involve the use of herbicides.

KWB construction and operation activities would represent a potentially significant impact to construction workers or the public by exposing them to hazards of the accidental release of hazardous materials.

Construction contracts would include specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels. Title 8 of the CCR also addresses the use of hazardous products in the work environment, which would apply to construction contractors. The potential for inadvertent spills of materials, which could affect nearby surface water bodies or groundwater, would be managed through NPDES construction site BMPs (see Section 7.0.4.1.1) and measures included in the KWB HCP/NCCP Vegetation Management Plan (Appendix 7-7c) and the 1995 Monterey IS and Addendum (Appendix 7-6a).

Although these measures are available and required, the impact of KWB activities from 2015 to 2030 with regard to exposing workers or the public to previously unidentified hazards or hazardous materials could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.11-1 would reduce impacts of KWB activities with regard to exposing workers or the public to previously unidentified hazards or hazardous materials to less than significant. KWBA is subject to legal requirements regarding hazardous materials and herbicide use (see Sections 7.0.4.1.2 and 7.0.4.1.5 in subsections a) and b) below) and is obligated to carry out the measures (Section 7.0.4.3.1, 1997 Monterey IS and Addendum; and Section 7.0.4.3.2, 2016 KWBA Resolution) in subsections b) and c) below. Therefore, the impact of KWB activities from 2015 to 2030 with regard to exposing workers or the public to previously unidentified hazards or hazardous materials would be ***less than significant, with mitigation***.

7.11-1 KWBA will implement the following measures:

- a) *Require construction contracts to include specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels and Title 8 of the CCR which addresses the use of hazardous products in the work environment, which would apply to construction contractors. (See Section 7.0.4.1.2.)*
- b) *Ensure that the use of herbicides on the site shall be permitted in accordance with the KWB HCP/NCCP Vegetation Management Plan, which will incorporate by reference any other applicable laws, rules, and regulations regarding the use of pesticides as they take effect. (Measure B-3(e), Ongoing Pesticide Use, in 1997 Monterey IS and Addendum)(see Appendix 7-6a and Section 7.0.4.1.5).*
- c) *Provide a comprehensive Worker Environmental Awareness Program (WEAP) that will include all training requirements identified in Best Management Practices, Worker Site Specific Health and Safety Plan, and mitigation measures, including training for all field personnel (e.g., KWBA employees, agents, and contractors). The WEAP shall include protocols and training for responding to and handling of hazardous materials and hazardous waste management, and emergency preparedness, release reporting, and response requirements. KWBA will ensure that all construction workers at risk of inhaling dust shall be provided masks with filters designed to trap spores of the size of Valley Fever fungus. (See Appendix 7.6b, 2016 KWBA Resolution).*
- d) *Comply with Mitigation Measure 7.8-1 and 7.8-2.*

7.11-2 **KWB activities could create a hazard to the public or environment through accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials.**

1996 — 2014

Construction of KWB facilities during this time period included the use of heavy equipment as well as the use, transport, and disposal of hazardous materials. Construction contracts included specific language requiring contractors to comply with applicable hazardous materials management laws and regulations adopted at the State level in Titles 19 and 22 of the CCR, which address proper storage and disposal of substances such as fuels. Title 8 of the CCR also addresses the use of hazardous products in the work environment, which would apply to construction contractors. The potential for inadvertent spills of materials, which could affect nearby surface water bodies or groundwater, was managed through NPDES construction site BMPs and measures included in the KWB HCP/NCCP Vegetation Management Plan (Appendix 7-7c). The 1997 Monterey IS and Addendum (Appendix 7-6a) also included a requirement that pesticides be used in accordance with the KWB HCP/NCCP Vegetation Management Plan. No known exposure of hazards or hazardous materials to workers or the public were documented as a result of accidental releases during KWB construction or operations activities from 1996 through 2014.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Future routine activities of the KWB may require maintenance of ponds, canals, and infrastructure, including periodic earthwork operations for berm maintenance, soil permeability enhancement, and removal of vegetative growth. Routine operations also include such activities as water quality monitoring and security inspections at specified intervals.

These activities would involve field equipment and vehicles which require the use, transport, and disposal of hazardous materials, including petroleum-based fuels and lubricants. The use, handling, storage, and disposal of any hazardous classified materials would be practiced under local, state, and federal regulations. Hazardous material transport would also comply with any Caltrans requirements and regulations.

The KWB HCP/NCCP requires KWBA's application of pesticides to comply with CDPR regulations with regards to recharge basins and proximity to wellheads. The transport and disposal of pesticides would be done in accordance with applicable regulatory requirements.

Any future construction activities would require contractors to comply with federal, state, and local regulations regarding the use, handling, storage, and disposal of any materials classified as hazardous. The project would include the construction of recharge ponds which would involve the use of heavy equipment containing fuels and lubricants.

Although regulations exist to prevent accidental release of hazardous materials,, KWB construction activities would represent a potentially significant impact to construction workers or the public by potentially exposing them to the accidental release of hazards or hazardous materials.

Therefore, the impact of future KWB activities from 2015 to 2030 with regard to accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.11-1 would reduce impacts of KWB activities with regard to accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials to less than significant. Therefore, the impact of KWB activities from 2015 to 2030 with regard to accidental release of hazardous materials or through routine transport, use, or disposal of hazardous materials would be ***less than significant, with mitigation***.

7.11-2 *KWBA will implement Mitigation Measure 7.11-1.*

7.11-3 KWB activities could potentially be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a potential hazard for the environment and people residing or working in the immediate area.

1996 — 2014

The 2007 DEIR Appendix E listed several Areas of Potential Environmental Concern associated with past uses of KWB Lands. All of these areas which became KWBA's responsibility upon land acquisition

have been cleaned up, remediated, and/or closed, including Buena Vista Ranch Headquarters, HSST Ranch Headquarters, and S&M Farms. Since these Areas of Potential Environmental Concern have been addressed, the impacts to human health and the environment and people residing or working in these areas were less than significant.

A list of previous and ongoing investigations of hazardous sites on and near KWB Lands (within 1-mile radius) has been compiled in Table 7.11-4 from an EDR, Inc. report. Two sites from Table 7.11-4 were listed as open and/or being monitored for further contamination(s) on specific State databases.

Continental Carbon, approximately one-quarter mile north of KWB Lands, is listed as an open yet inactive facility on the Geotracker database. Carbon black, a material created from the incomplete combustion of petroleum products, was produced at this site from approximately 1960 to 1980. Wastewater was disposed to ponds when operating. EPA performed a site screening in 1988 and concluded that contamination of groundwater was not a major concern due to the immobility and insolubility of the particulates left in soil.⁷⁰ The immobility of the carbon black suggests that the impacts to the environment and to construction workers and operations and maintenance workers were less than significant.

A site investigation in 1996 at the Frank Uhler Petroleum Fire Training Facility discovered crude/waste oil in the groundwater. Additional investigations were completed in September 2004, February 2005, and May 2007.⁷¹ Following soil removal, no PCE or TCE was detected above MCLs after groundwater sampling in July 2012.⁷² In addition, metals were detected but below their respective MCLs. TPH as diesel was discovered above its MCL. Monitoring has not been conducted since July 2012, as a result of low groundwater depths, but is expected to continue as groundwater levels permit.

As presented above, several hazardous material sites were located on or near KWB Lands. However, implementation of remediation activities at all of these hazardous sites reduced potential impacts to the environment and to construction and operations and maintenance workers. No known exposure of hazards or hazardous materials to workers were documented.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to location on a site which is included on a list of hazardous materials sites was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

The KWBA's proposed layout of future recharge basin and conveyance structures has been designed to avoid these hazardous sites. Should any future KWB construction activities require access to a listed site, measures would be taken to avoid these sites or a site investigation would be performed to evaluate the potential for impacts to the environment, including to the public and construction workers. Of the identified list of hazardous sites that are classified as "open" (see Table 7.11-4), one is not on KWB Lands (Continental Carbon) and the other (Uhler) has had contaminated soil excavated.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to a location which is included on a list of hazardous materials sites would be ***less than significant***.

Mitigation Measures

None required.

7.11-4 KWBA activities with regard to accidents and upsets from onsite and adjacent third-party activities on or near KWB Lands could potentially create a significant hazard to the public or environment.

1996 — 2014

This section evaluates potential impacts of specific third-party activities, with the exception of potential impacts to groundwater, which are discussed in Section 7.2, Surface Water and Groundwater Quality.

The oilfields in and adjacent to KWB Lands include wastewater injection wells that are subject to regulation by DOGGR Class II Underground Injection Control (UIC) program, which enforces the requirement of the federal Safe Drinking Water Act. Written approval from DOGGR is required before any subsurface injection associated with oil or gas production can begin. Injection wells have been constructed to enable the disposal of wastewater produced during oil production. Two injection wells near KWB Lands, although presently active, have records indicating water disposal at approved depths that present no connectivity to groundwater zones.

All accidents and upsets involving hazardous materials on KWB Lands would be required to comply with regulations of the Kern County Operational Hazardous Materials Area Plan. Prior to activities, all parties would need to prepare a Spill Prevention Countermeasure and Control Plan, submitted for approval to Kern County. The plan would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup. Due to the depth of the injection well relative to the usable groundwater aquifer, the introduction of hazardous materials into the groundwater due to co-location of the proposed KWB recharge ponds with the existing oilfield injection wells is not expected and would be less than significant.

For background information on the related party and details of the event, please refer to Section 7.11.2.2, Changes in Physical Setting between 1996 and 2014.

Rio Bravo–Estero Pipeline (Chevron USA) Investigation Area

The Rio Bravo–Estero pipeline is currently abandoned in place and was last in operation in 1995. Historically, the pipeline was used to carry heavy and light crude oils.

Vintage Sump Closures – Strand Oil Field (ARCO)

The remaining TRPH impacted soil at this location would be about 29 feet or less above the first aquifer at the time of remedial activities. Based on the sampling performed, it is uncertain how much deeper and at what concentration the TRPH extends downward. The tank farms where sump removal activities occurred are not located on existing recharge ponds. Therefore, construction and past operations and maintenance workers would not have been exposed to impacted soil from these sumps.

Grayson Services, Inc.

The 1991 Phase I Environmental Site Assessment determined the facility's location did not pose an immediate threat to KWB groundwater recharge or extraction operations.⁷³ The Grayson site was not accessible to the general public and, therefore, any inappropriately stored hazardous waste would not have been expected to represent a significant hazard to the public. However, since neither the concentration of constituents nor the extent of any potential releases addressed in the 1991 Phase I

Environmental Assessment has been characterized, the degree of any potential adverse impacts to KWB Lands or the environment from past activities is unknown at this time.

Conclusion

Significant hazard to the public or environment through accidents and upsets from onsite and adjacent third-party activities during 1996 through 2014 appears limited to the Grayson site. Impacts to operations and maintenance workers near this site are limited and there is no evidence that workers or the public were exposed to hazardous materials.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to accidents and upsets from onsite and adjacent third-party activities was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

The oilfields in and adjacent to KWB Lands include wastewater injection wells that are subject to regulation by DOGGR Class II Underground Injection Control (UIC) program, which enforces the requirement of the federal Safe Drinking Water Act. Written approval from DOGGR is required before any subsurface injection associated with oil or gas production can begin. Injection wells have been constructed to enable the disposal of wastewater produced during oil production. Two injection wells near KWB Lands, although presently active, have records indicating water disposal at approved depths that present no connectivity to groundwater zones.

All accidents and upsets involving hazardous materials on KWB Lands would be required to comply with regulations of the Kern County Operational Hazardous Materials Area Plan. Prior to activities, all third parties would need to prepare a Spill Prevention Countermeasure and Control Plan, submitted for approval to Kern County. The plan would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup. Due to the depth of the injection well relative to the usable groundwater aquifer, the introduction of hazardous materials into the groundwater due to co-location of the proposed KWB recharge ponds with the existing oilfield injection wells is not expected and would be less than significant.

Rio Bravo–Estero Pipeline (Chevron USA)

Chevron USA, in accordance with the “Settlement Agreement” made with KWBA on December 1, 2010, is required to abandon the pipeline in place and return the property to its prior condition.⁷⁴ Although the 1996 impacted sample boring exceeded 10,000 mg/kg, the sample was anomalous as sample depths above and below were non-detect. The nearest soil boring, approximately 20 feet away, was also non-detect. Therefore, impacts related to public workers and the environment would be less than significant.

Vintage Sump Closures – Strand Oil Field (ARCO)

There are no new recharge ponds planned to be constructed at or near the two sump closures, where workers could be exposed to impacted soil. The remaining TRPH impacted soil of 4,400 mg/kg at M13L8 is located on the East Strand Tank Farm which is more than 2,000 feet from the nearest existing recharge pond and more than 1,400 feet from the nearest KWB groundwater recovery well (8M1). Due to the lateral distance from the area of concern to the nearest KWB recharge ponds and recovery wells, the impacts to public workers and the environment would be less than significant.

Grayson Services, Inc.

The Grayson site is not accessible to the general public and, therefore, any inappropriately stored hazardous waste is not expected to represent a significant hazard to the public. However, since neither the concentration of constituents nor the extent of any potential releases have been characterized, the degree of any potential adverse impacts to KWB Lands from activities is unknown at this time.

KWBA workers could potentially be exposed to hazardous wastes in the three basins. Since neither the concentration of constituents in the three basins onsite nor the extent of any potential releases has been characterized, the degree of potential adverse impacts to the KWB Lands from these basins is unknown at this time. The identified Grayson site which is classified as open continues to represent a potential source of impact although current conditions do not allow public access to the site. Nonetheless, potential impacts to human health to public workers and the environment could be potentially significant.

Conclusion

The sites discussed above do not pose risks to human health of construction and site workers; however, the Grayson site poses potential for interactions between hazardous sites and KWB activities.

Therefore, impact of KWB activities from 2015 to 2030 with regard to accidents and upsets from onsite and adjacent third-party activities could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.11-4 would reduce impacts of KWB activities with regard to accidents and upsets from onsite and adjacent third party activities to less than significant. KWBA is obligated to carry out the measures (see Section 7.0.4.3.1, 1997 Monterey IS and Addendum, and Section 7.0.4.3.2, 2016 KWBA Resolution) in subsections b), and c) below. Therefore, the impact of KWB activities from 2015 to 2030 with regard to accidents and upsets from onsite and adjacent third party activities would be ***less-than-significant, with mitigation***.

7.11-4 *KWBA will implement the following measures:*

- a) *Implement Mitigation Measure 7.11-1.*
- b) *Continue to monitor the remediation of the current and any future hydrocarbon contamination from third-party oil and gas activities. (Measure C-2, Hydrocarbon Contamination Monitoring, in 1997 Monterey IS and Addendum)(See Appendix 7-6a.)*
- c) *KWBA shall implement the following measures before and during ground-disturbing activities to reduce health hazards associated with potential exposure to hazardous substances (2016 KWBA Resolution)(see Appendix 7-6b.)*
 - i. *If stained or odorous soil is discovered during project-related construction activities, KWBA shall retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment and/or other appropriate testing. Recommendations in the Phase II Environmental Site Assessment to address any contamination that is found shall be implemented before continuing with ground-disturbing activities in these areas.*
 - ii. *As required by law, notify the appropriate federal, state, and local agencies if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous*

groundwater) or if unknown or previously undiscovered underground storage tanks are encountered during construction activities.

7.11-5 KWB activities could potentially 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.

1996 — 2014

The KWB is located in a Local Responsibility Area (LRA). The majority of KWB Lands is classified as unzoned (unclassified fire hazard) with scattered small areas classified as a moderate fire hazard severity zone. The hilly terrain to the west is classified as a moderate fire hazard severity zone. KWB Lands are generally undeveloped land with recharge ponds (basins), water canals, water wells, and well pipelines to convey water; other non-water development third-party uses include oil well and pipeline maintenance, and transmission line maintenance. Uses of surrounding lands include oil production and agriculture. The vegetation on KWB Lands is predominantly comprised of a variety of grasses and weeds, with local groupings of shrubs (e.g., Russian thistle, tumbleweed) and small trees. Herbaceous vegetation is common in the dry recharge pond basins. Vegetation in the surrounding areas includes the above and various agricultural crops.

Past vegetation management on KWB Lands has included controlled burns, herbicide application, and grazing. During controlled burning, which would be under permit from the San Joaquin Valley Unified Air Pollution Control District and Kern County Fire Department (see Sections 7.0.4.1.3 and 7.0.4.1.4), no people or structures were subjected to any significant loss, injury, or death from this activity. In addition, existing fire protection services within and surrounding KWB Lands (associated with the oil production facilities) include the Kern County Fire Department and the City of Bakersfield Fire Department, both with stations located nearby to the east (see Section 7.14, Public Services, and Section 7.0.4.1.4 for more detail regarding fire protection services). Uncontrolled wildland fire did not occur from 1996 through 2014.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to wildland fires was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

KWBA would continue to manage KWB Lands as described for 1996 through 2014, and there would be no increased risk of wildland fires compared to 1996 through 2014. The area is characterized by sparse vegetation controlled by burns (see Sections 7.0.4.1.3, Air Quality Standards; and 7.0.4.1.4, Burn Permits), herbicide application, and grazing; lack of adjacent urbanized areas or residences; periodic flooding of the recharge basins; and availability of nearby fire protection services.

Therefore, the impact of KWB activities from 2015 to 2030 related to wildland fires would be ***less than significant***.

Mitigation Measures

None required.

7.11-6 KWB activities could increase airborne vector populations or the likelihood of waterborne disease or illness.

1996 — 2014

Mosquitoes are common within KWB Lands due to the abundance of standing water in ponds. Five species in particular occur in abundance and can cause health and nuisance problems. They are *Culex tarsalis* (the encephalitis mosquito), *Aedes melanimon*, *Anopheles freeborni* (the western malaria mosquito), *Anopheles franciscanus*, and *Culiseta inornata*. KWB Lands fall within the jurisdiction of two local mosquito abatement districts (Kern and Westside Mosquito Abatement Districts), that monitor and, when necessary, eradicate mosquito larvae and adults). KWB Lands are rural with few humans present, and no reported cases of mosquito-borne diseases or illnesses have been attributed specifically to KWB recharge ponds or conveyance facilities.

KWB Lands are located in California's San Joaquin Valley where Valley Fever is known to exist. Valley Fever is an infection which results from inhalation of the fungus (*Coccidioides immitis*). Spores live in soil, and Valley Fever can be contracted only from inhalation of spores; it cannot be passed from an infected person to an uninfected person. Spores can enter the air when ground-moving activities, including natural disasters such as earthquakes or excavation activities, disturb spore-bearing soil. Earth-moving activities during construction or maintenance of KWB facilities may have disturbed soils and caused the fungus to become airborne. Appropriate personal protective equipment for construction contractors and dust control BMPs minimize risk to exposure to airborne particulates.

KWB facilities have been constructed and in operation over nearly the past 20 years. KWB Lands are rural with few humans, and no reported cases of mosquito-borne diseases or illnesses, or Valley Fever, have been attributed specifically to KWB-related activities.

Therefore, the impact of KWB activities from 1995 to 2014 with regard to airborne vector populations or the likelihood of waterborne disease or illness was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Future KWB activities include construction of new recharge ponds and ancillary facilities, as well as continued recharge, recovery, and operations and maintenance activities. The construction activities would disturb the soil and potentially cause the Valley Fever fungus to become airborne during earth-moving activities. The additional recharge basins would lead to increased surface areas of standing water that may increase areas for vectors to gather and provide a breeding ground for mosquito larvae.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to airborne vector populations or the likelihood of waterborne disease or illness could be ***potentially significant***.

Mitigation Measures

Mitigation Measure 7.11-6 would reduce impacts of KWB activities with regard to airborne vector populations or the likelihood of waterborne disease or illness to less than significant. KWBA is obligated to carry out the measures below in subsection b) (see Section 7.0.4.3.1, 1997 Monterey IS and Addendum). Therefore, the impact of KWB activities from 2015 to 2030 with regard to airborne vector populations or the likelihood of waterborne disease or illness would be ***less than significant, with mitigation***.

7.11-6: *KWBA will implement the following:*

- a) *Implement Mitigation Measure 7.11-1(c).*
- b) *Implement Measure P-1, Implementation of Mosquito Abatement Plan, in the 1997 Monterey IS and Addendum (see Appendix 7-6a) with modifications for measures that proved infeasible or unsuccessful. In accordance with the Mosquito Abatement Plan, KWBA will engage in the following procedures which are expected to reduce any impact due to the breeding of mosquitoes in the recharge basins to insignificance:*
 - i. *KWBA will notify staff of the Kern and Westside Mosquito Abatement Districts (District) of planned use of recharge basins.*
 - ii. *Roads on the KWB will be kept in a reasonable condition to allow the District access to the KWB.*
 - iii. *KWBA will assist District staff in adaptive management planning to review the success of mosquito control techniques and to develop improved mosquito control techniques.*

ENDNOTES

1. Environmental Data Resources, Inc. 2015 (April). EDR Data Map Area Study, Kern Water Bank. Report Inquiry Number 4270495.5. Shelton, CT.
2. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March). District 4 Oil and Gas Well Data: API No. 029-20679 Available: http://owr.conservacion.ca.gov/WellRecord/029/02920679/02920679_DATA_2015-07-23.pdf. Accessed March 5, 2015.
3. California Department of Water Resources. 1990 (December). *Kern Water Bank, First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Pages 44 through 69.
4. California Department of Water Resources. 1990 (December). *Kern Water Bank, First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Pages 61 through 69 and pages 87 through 94.
5. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
6. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
7. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
8. *Applied Environmental Microbiology* 66(7) 2000 (July).
9. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
10. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
11. California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element, Draft Supplemental Environmental Impact Report*. Sacramento, CA.
12. Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA. Pages 2 and 45–53.
13. Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA. Pages 5 and 22–32.
14. Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA. Pages 5, 8, and 31–39.
15. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA. Pages 4, 7, and 23–28.

16. Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA. Pages 9 and 25.
17. Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA. Pages 7 and 25.
18. Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA. Pages 7 and 25.
19. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA. Pages 31 and 35.
20. Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Annual Compliance Report and Management Plan*. Bakersfield, CA. Pages 31 and 35.
21. Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Report and 2006–2007 Management Plan*. Bakersfield, CA.
22. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA. Page 16.
23. EnviroTech Consultants, Inc. 2014 (August). *Groundwater Monitoring Plan for North Cole's Levee Well Stimulation Treatment*, Central Resources, Inc. Bakersfield, CA. Page 6.
24. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March) District 4 Oil and Gas Well Data. Available: <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>. Accessed March 5, 2015.
25. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March). District 4 Oil and Gas Well Data Available: <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>. Accessed March 5, 2015.
26. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March). District 4 Oil and Gas Well Data. Available: <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>. Accessed March 5, 2015.
27. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March). District 4 Oil and Gas Well Data. Available: <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>. Accessed March 5, 2015.
28. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 (March). District 4 Oil and Gas Well Data: API No. 029-20679 Available: http://owr.conservation.ca.gov/WellRecord/029/02920679/02920679_DATA_2015-07-23.pdf. Accessed March 5, 2015.

29. Aspen Environmental Consultants for California Department of Conservation. 2014 (October). *Draft Environmental Impact Report for Analysis of Oil and Gas Well Stimulation Treatments in California*. Page 10.13-5.
30. California Department of Toxic Substances Control and Kern Water Bank. 2000 (March 3). DTSC and KWB, Certification of the KWBA, Buena Vista Ranch and HSST Parcel.
31. Environmental Data Resources, Inc. 2015 (April). EDR Data Map Area Study, Kern Water Bank. Report Inquiry Number 4270495.5. Shelton, CT.
32. Central Valley Regional Water Quality Control Board. 2008 (November 14). No Further Action Letter, Former Rio Bravo Pump Station.
33. Central Valley Regional Water Quality Control Board. 2008 (November 14). No Further Action Letter, Former Rio Bravo Pump Station.
34. Geomatrix Environmental Consultants. 1996 (January 18). *Soil Assessment Results*, Rio Bravo–Estero Pipeline. Page ii.
35. Kern Water Bank Authority and Chevron Pipeline Company. 2010 (December 1). *Settlement Agreement*.
36. RWQCB Geotracker. 2015. Chevron Pipeline Wait-Midway. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL205234273. Accessed May 14, 2015.
37. RWQCB Correspondence. 2013 (February 6). No Further Action Status Chevron Wait-Midway Pipeline.
38. Conesta Rovers & Associates. 2013 (August 12). *Well Destruction Report, Chevron Wait-Midway Pipeline*.
39. RWQCB Correspondence. 2001 (January 9). Inspection Report—Thomas Oil Company, Discharge of Oily Wastewater. Strand Oil Field, Kern County.
40. RWQCB Correspondence. 2001 (January 30). Inspection Report – Thomas Oil Company, Discharge of Oily Wastewater. Strand Oil Field, Kern County.
41. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2003 (September 7). Correspondence.
42. California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2008 (March 7). Correspondence: Request for Assistance for Access and Environmental Clearance Strand Oil Field, Kern County Thomas Oil Company (Phase 2).
43. Central Valley Regional Water Quality Control Board. 2013 (November 15). No Further Action Letter, Former Thomas Oil Company Leases, Strand Oil Field.
44. RWQCB Geotracker. 2015. Uhler Fire Fighting Facility. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0602903940. Accessed May 14, 2015.

45. Central Valley Regional Water Quality Control Board, Correspondence, 2011.
46. Pacific Environmental Group, Inc. 1996 (August 15). *Sludge Sampling and Analysis and Proposed Sump Closure Protocol, Vintage Subsurface Facility Removal Project, Kern County, California.*
47. LUFT Engineers & Environmental Consultants, Inc. and Kern Water Bank Authority. 1997 (June). *Review of Closure of Sumps in Strand Oil Field.*
48. Quad Knopf, Inc. and Kern Water Bank Authority, 2005 (October 3). Correspondence.
49. Live Oak Associates, Inc. and Kern Water Bank Authority, Correspondence, 2008.
50. South Valley Biological Consultants, Inc. and Kern Water Bank Authority, Correspondence, 2011.
51. Central Valley Regional Water Quality Control Board. 2015 (August 31), Cleanup and Abatement Order No. R5-2015-0730, Grayson Services, Inc. KCL-E Lease, Canal Oil Field, Bakersfield, CA.
52. West Kern Water District. 2012 (April 24). Board of Directors Meeting Minutes Report.
53. Flint, S. A. 1987 (November 23). *Preliminary Assessment—Continental Carbon Co.* California Department of Health Services, Toxic Substances Control Division. Page 11.
54. Flint, S. A. 1987 (November 23). *Preliminary Assessment—Continental Carbon Co.* California Department of Health Services, Toxic Substances Control Division. Page 11.
55. RWQCB Geotracker. Continental Carbon Co. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SLT5FQ494341. Accessed November 2015.
56. Bauer, Charles, for Kern County Environmental Health Services Department. 2011 (December 12). KCEHSD Hondo's Site Visit and Related Chronological Activities (2001 to 2011).
57. Bauer, Charles, for Kern County Environmental Health Services Department. 2011 (December 12). KCEHSD Hondo's Site Visit and Related Chronological Activities (2001 to 2011).
58. Bauer, Charles, for Kern County Environmental Health Services Department. 2011 (December 12). KCEHSD Hondo's Site Visit and Related Chronological Activities (2001 to 2011).
59. MCGaeggee, M. R. 2013 (October 14). *Annual Groundwater Monitoring Report at the Hondo, Inc. Facility 20807 Stockdale Highway.* Bakersfield, CA.
60. Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Report and 2006-2007 Management Plan*
61. California Department of Forestry and Fire Protection. 2015. Wildland Hazard & Building Codes. Available: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs.php#sra01. Accessed May 26, 2015.

62. California Department of Forestry and Fire Protection. 2007. *Draft Fire Hazard Safety Zones in LRA, 2007*.
63. Kern County Public Health Services Department. 2008. *Fight the Bite! Protect Yourself and Your Family from West Nile Virus!*
64. Kern County Public Health Services Department. 2015. West Nile Virus. <http://kernpublichealth.com/west-nile-virus/>. Accessed December 10, 2015.
65. Kern County Department of Public Health. 2015. Kern County Valley Fever Cases by Selected Measure. Available: <http://kerncountyvalleyfever.com/cases-in-kern-county-2/>. Accessed December 2, 2015.
66. Kern County Department of Public Health. 2015. Kern County Valley Fever Cases by Selected Measure. Available: <http://kerncountyvalleyfever.com/cases-in-kern-county-2/>. Accessed December 2, 2015.
67. WestLaw Next by Thompson Reuters. 2015. California Code of Regulations. Available: https://govt.westlaw.com/calregs/index?__lrTS=20151215173928352&transitionType=Default&contextData=%28sc.Default%29#agency. Accessed December 11, 2015.
68. WestLaw Next by Thompson Reuters. 2015. California Code of Regulations. Available: https://govt.westlaw.com/calregs/index?__lrTS=20151215173928352&transitionType=Default&contextData=%28sc.Default%29#agency. Accessed December 11, 2015.
69. Kern County. 2014 (October). *Operational Hazardous Materials Plan*. Bakersfield, CA.
70. Flint, S. A. 1987 (November 23). *Preliminary Assessment—Continental Carbon Co*. California Department of Health Services, Toxic Substances Control Division. Page 11.
71. RWQCB Geotracker. 2015. Uhler Fire Fighting Facility. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0602903940. Accessed May 14, 2015.
72. Central Valley Regional Water Quality Control Board, Correspondence, 2011.
73. California Department of Water Resources and Kern Water Bank Authority. 1996 (March). *Wrap Up Report*.
74. Kern Water Bank Authority and Chevron Pipeline Company. 2010 (December 1). *Settlement Agreement*.

7.12 NOISE (REVISED)

7.12 NOISE (REVISED)

7.12.1 INTRODUCTION

7.12.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.12 identified potential impacts to noise as a result of the transfer of the Kern Fan Element. Text from DEIR Section 7.12 that discusses KWB activities is copied below and shows revisions to this section. All other text in DEIR Section 7.12 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.12-1A identifies the potentially affected environmental resources from impacts of KWB activities on noise.

TABLE 7.12-1A

IMPACTS OF KWB ACTIVITIES~~PROPOSED PROJECT ELEMENTS~~ ON NOISE

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Noise associated with construction and operation of groundwater storage facilities in Kern Fan Element	7.12-3

During public review of the NOP for ~~this~~ the Monterey Plus EIR, interested parties submitted no comments regarding noise.

7.12.1.2 Analytical Method

The assessment of potential noise impacts was conducted in accordance with standard professional practices. Factors considered in the qualitative analysis include:

- sources of new or increased noise levels;
- the nature and magnitude of changes in noise;
- the types of sensitive land uses that would be exposed to new or increased noise levels; and
- likely reactions to changes in community noise levels.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to noise, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.12.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For purposes of this REIR, implementation of the KWB activities~~proposed project~~ may have a significant adverse noise impact if it would result in any of the following:

- exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinances, or applicable standards of other agencies;
- exposure of persons to or generation of excessive and substantial groundborne vibration or groundborne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The CEQA Guidelines also do not define the levels at which temporary and permanent increases in ambient noise are considered “substantial.” For the purposes of this analysis, noise impacts would be considered significant if the KWB activities~~project~~ resulted in the following:

- construction activities lasting more than one day that increase the ambient noise levels by 10 dBA or more at any noise-sensitive location;
- a permanent (i.e., long term operational) increase of 5 dBA Community Noise Equivalent Level (CNEL) over ambient noise levels at any noise-sensitive land use; or

- a permanent (i.e., long term operational) increase of 3 dBA CNEL over ambient noise levels at any noise-sensitive land use location where the future resulting noise level would exceed 70 dBA CNEL (i.e., the noise levels would be considered unacceptable for noise-sensitive uses by most public agencies).

The CEQA Guidelines do not define the levels at which groundborne vibration or groundborne noise is considered “excessive.” This analysis uses the Federal Railway Administration’s vibration impact thresholds for sensitive buildings, residences, and institutional land uses. These thresholds are 65 VdB at buildings where vibration would interfere with interior operations (e.g., sensitive research buildings), 80 VdB at residences and buildings where people normally sleep, and 83 VdB at institutional buildings with primarily daytime use.¹

7.12.2 ENVIRONMENTAL SETTING

7.12.2.1 Introduction

Fundamentals of Sound and Environmental Noise

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (“dB”). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (“dBA”) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady “background” noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Table 7.12-2 lists representative noise levels for the environment.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- L_{eq} —The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- L_{dn} —The Day-Night Average Noise Level, is a 24-hour average L_{eq} with a 10 dBA “penalty” added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.4 dBA L_{dn} .
- *CNEL*—The Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 10 dBA “penalty” added to noise during the hours of 10:00 P.M. to 7:00 A.M., and an additional 5 dBA penalty during the hours of 7:00 P.M. to 10:00 P.M. to account for noise sensitivity in the evening and nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.7 dBA *CNEL*.

TABLE 7.12-2
REPRESENTATIVE ENVIRONMENTAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock Band
Jet Fly-over at 100 feet		
	—100—	
Gas Lawnmower at 3 feet		
	—90—	
		Food Blender at 3 feet
Diesel Truck going 50 miles per hour at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Source: California Department of Transportation, 1998.

- L_{50} —A statistical noise level, is the noise level which is exceeded 50 percent of the time during which the noise is measured.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24 hour period. Environmental noise levels are generally considered low when the L_{dn} or CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated natural settings that can provide noise levels as low as 20 dBA, and quiet suburban residential streets that can provide noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of low-moderate level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with more noisy urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA).

When evaluating changes in 24-hour community noise levels, a difference of 3 dBA is a barely-perceptible increase to most people.² A 5 dBA increase is readily noticeable, while a difference of 10 dBA would be perceived as a doubling of loudness.³ Except in a carefully controlled laboratory condition, a change of 1 dBA is very difficult to perceive.

Noise levels from a particular source generally decline as distance to the receptor increases. Other factors such as the weather and reflecting or shielding also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically “hard” locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-

packed soil, or other solid materials) and 4.5 dBA at acoustically “soft” locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels are also generally reduced by 1 dBA for each 1,000 feet of distance due to air absorption. Noise levels may also be reduced by intervening structures—generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 dBA with closed windows. The exterior-to-interior reduction of newer homes is generally 30 dBA or more.

Fundamentals of Environmental Groundborne Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured as particle velocity in inches per second and in the U.S. is referenced as vibration decibels (VdB).

The background vibration velocity level in residential and educational areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, and 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.⁴

The general human response to different levels of groundborne vibration velocity levels is described in Table 7.12-3.

HUMAN RESPONSE TO DIFFERENT LEVELS OF GROUND BORNE VIBRATION	
Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: Federal Railroad Administration, 1998.

7.12.2.2 Physical Setting in 1995

Prior to the California Department of Water Resources’ (Department’s) purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. Most of the land was used for agriculture.

Before the KFE property was transferred to KCWA, the Department managed the KFE property by:

- performing demonstration studies and exploratory investigations for the potential development of the KFE property as a water banking facility; and
- controlling weeds, dust, trespassers, and vandalism.

Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services Inc., had a residence with an equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property.

~~The Kern Fan Element consists of 19,900 acres of land located in Kern County southwest of Bakersfield. The Kern Fan Element lies on both sides of the Kern River but does not include the river itself, or the lands within the river levees. In 1995, there were no major structures on Kern Fan Element except for I-5, the Cross Valley Canal, and some abandoned tanks and other oil field equipment.~~

~~The Kern Fan Element was farmed for many years until the mid-1980s. After the California Department of Water Resources (Department) purchased the land in 1986, the agricultural fields were gradually taken out of production. By 1995, agriculture had ceased on the property and introduced annual grasses and forbs had colonized the land. Therefore, vehicular traffic is the primary source of noise throughout the area. The Kern Fan Element is primarily bisected by rural roads, SRs 99, 119, 166, and 223, and I-5.~~

7.12.2.3 Changes in Physical Setting between 1996 – 201403

~~Between 1996 and 201403, noise levels in the immediate vicinity of KWB Lands proposed project in the Kern Fan Element increased temporarily while recharge/percolation ponds, and the Kern Water Bank Canal, and other ancillary facilities were constructed as described above. Otherwise, ambient noise levels on KWB Lands in the Kern Fan Element are similar to those in 1995.~~

7.12.2.4 Regulatory Setting in 1995

The California Government Code requires that a noise element be included in the general plan of each county and city in the state. These noise elements serve as comprehensive programs for including noise control in the land use planning process. They are tools that county and city planners use to ensure that sensitive land uses are not exposed to excessive noise levels, and that mitigation be identified and implemented to ensure noise-generating activities do not adversely affect such uses.

Kern County General Plan Noise Element

The major goals of the Noise Element of the *Kern County General Plan* are to establish reasonable standards for maximum desired noise levels in Kern County and to develop implementation programs which could effectively deal with noise.⁵ Because vehicular traffic is the primary source of noise throughout the area, the noise standards and programs were prepared to address this source. The noise standards adopted by the County are identified in Section 7.12.2.5 Table 7.12-4 below.

7.12.2.5 Changes in Regulatory Setting between 1996 – 201403

Kern County General Plan, Noise Element

The *Kern County General Plan* was amended in 2009 with new noise standards. Kern County has identified the following as noise-sensitive land uses: residential areas, schools, convalescent and

acute-care hospitals, parks and recreational areas, and churches. The following goals and policies from the Noise Element of the Kern County General Plan (adopted in 2004 and amended in 2009) related to noise would be applicable to KWB activities:

Goal 1: Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

Goal 2: Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

- Policy 1: Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.
- Policy 5: Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:
 - a. 65 dB Ldn [day-night average noise level] or less in outdoor activity areas;
 - b. 45 dB Ldn or less within interior living spaces or other noise sensitive interior spaces.
- Policy 7: Employ the best available methods of noise control.⁶

The policies are to be implemented by requiring that proposed commercial and industrial uses or operations be designed or arranged so that they will not subject residential or other noise-sensitive land uses to exterior noise levels in excess of 65 dB Ldn and interior noise levels in excess of 45 dB Ldn.

Kern County Noise Ordinance

According to Section 8.36.020, "Prohibited Sounds," of the Kern County Noise Ordinance, it is unlawful for any person to do, or cause to be done, any of the following acts within the unincorporated areas of the county:

- Paragraph H. To create noise from construction, between the hours of nine (9:00) p.m. and six (6:00) a.m. on weekdays and nine (9:00) p.m. and eight (8:00) a.m. on weekends, which is audible to a person with average hearing faculties or capacity at a distance of one hundred fifty (150) feet from the construction site, if the construction site is within one thousand (1,000) feet of an occupied residential dwelling except as provided below:
 1. The development services agency director or his designated representative may for good cause exempt some construction work for a limited time.
 2. Emergency work is exempt from this section.

Metropolitan Bakersfield General Plan, Noise Element

Maintenance of desirable noise exposures for sensitive areas is addressed through consideration of sporadic noise normally associated with stationary land uses. Table 7.12-4A provides a method of determining land use compatibility for sensitive uses through the assignment of noise exceedance levels and time restrictions.⁷

TABLE 7.12-4A**BAKERSFIELD NOISE LEVEL PERFORMANCE STANDARDS*—EXTERIOR NOISE LEVEL STANDARDS**

• Category	• Cumulative Number of Minutes in Any One-Hour Period	• Daytime 7 a.m. to 10 p.m.	• Nighttime 10 p.m. to 7 a.m.
<u>1</u>	<u>30</u>	<u>55</u>	<u>50</u>
<u>2</u>	<u>15</u>	<u>60</u>	<u>55</u>
<u>3</u>	<u>5</u>	<u>65</u>	<u>60</u>
<u>4</u>	<u>1</u>	<u>70</u>	<u>65</u>
<u>5</u>	<u>0</u>	<u>75</u>	<u>70</u>

Notes:

* Each of the noise level standards specified in this table shall be reduced by five (5) dB(A) [A-weighted decibels] for pure tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards should be applied at a residential or other noise-sensitive land use and not on the property of a noise generating land use.

Source: *Metropolitan Bakersfield General Plan*, Chapter VII, Noise Element, Page VII-8.

The following goals and policies from the Noise Element of the *Metropolitan Bakersfield General Plan* (adopted in 2002 and amended in 2007) related to noise would be applicable to KWB activities:

Goal 1: Ensure that residents of the Bakersfield Metropolitan Area are protected from excessive noise and existing moderate levels of noise are maintained.

Goal 2: Protect the citizens of the planning area from the harmful effects of exposure to excessive noise, and protect the economic base of the area by preventing the encroachment of incompatible land uses near known noise-producing roadways, industries, railroads, airports, and other sources.

- **Policy 3:** Review discretionary industrial, commercial or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses. Additionally, the development of new noise-generating land uses which are not preempted from local noise regulation will be reviewed if resulting noise levels will exceed the performance standards contained within Table VII-2 [6.13-2] in areas containing residential or other noise-sensitive land uses.
- **Policy 6:** Encourage interjurisdictional coordination and cooperation with regard to noise impact issues.⁸

City of Bakersfield Noise Ordinance

Section 9.22.050, "Noise during Construction," of the Bakersfield Noise Ordinance includes the following provisions that would be applicable to KWB activities:

- (1) Except as provided herein or in subsection B, C or D of this section, it is unlawful for any person, firm or corporation to erect, demolish, alter or repair any building, or to grade or excavate land, streets or highways, other than between the hours of six a.m. and nine p.m. on weekdays, and between eight a.m. and nine p.m. on weekends; provided, however, that city crews and those of the city's contractors performing street work between nine p.m. and six a.m. are exempt herefrom if the city engineer has directed that work be performed between such hours to alleviate potential traffic congestion.
- (2) Notwithstanding any other provisions of this chapter, if the city manager determines that the public health and safety will not be impaired by the erection, demolition, alteration or repair of any building or the excavating and grading of land, streets or highways between the hours of nine p.m. and six a.m., and if he or she further determines that loss or inconvenience would

result to any party in interest by virtue of the requirements provided in subsection A of this section, he or she may grant a permit for such work to be done between the hours of nine p.m. and six a.m., upon application being made at the time the permit for the work is awarded or during the progress of the work. Such permit may be granted for a period not to exceed three days, and may be extended by the city manager for a period not to exceed three days.

- (3) The provisions of this section shall not apply to any work of construction performed one thousand feet or more from the nearest residential dwelling.
- (4) The provisions of this section shall not apply to performance of emergency work as defined in this chapter. (Ord. 3924 § 3, 1999).⁹

7.12.3 IMPACTS AND MITIGATION MEASURES

7.12-3 Noise levels in the ~~KWB Lands~~~~Kern Fan Element~~ could be potentially affected by development of groundwater storage facilities.

1996 — 201403

Construction of the new groundwater storage facilities required the use of heavy-duty diesel equipment such as bulldozers, graders, trucks, and drilling equipment. The U.S. EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical construction activities. These data are presented in Table 7.12-5 and Table 7.12-6 for a reference distance of 50 feet. These noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 84 dBA measured at 50 feet from the noise source to the receptor would reduce to 78 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 72 dBA at 200 feet from the source to the receptor.

TABLE 7.12-5

NOISE RANGES OF TYPICAL CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Levels in dBA L_{eq} at 50 feet ¹
Front Loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic Impact Equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete Mixers	75–88
Concrete Pumps	81–85
Back Hoe	73–95
Pile Driving (peaks)	95–107
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

Note:

1. Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.

Source: U.S. EPA 1971 as presented in City of Los Angeles, 1998.

TABLE 7.12-6

TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Levels at 50 Feet (dBA L _{eq})	Noise Levels at 50 Feet with Mufflers (dBA L _{eq})
Ground Clearing	84	82
Excavation, Grading	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86

Source: U.S. EPA 1971 as presented in City of Los Angeles, 1998.

Construction activities primarily affected noise levels in the immediate vicinity of the construction sites. Construction activities that occurred under the KWB activities proposed project also had the potential to generate low levels of groundborne vibration. Table 7.12-7 identifies various vibration velocity levels for the types of equipment that could have been operated at the project sites during construction.

TABLE 7.12-7

TYPICAL VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

Construction Equipment	PPV (in./sec.)			
	25 Feet	100 Feet	200 Feet	400 Feet
Pile Driver (Impact)	0.644	0.081	0.028	0.010
Vibratory Roller	0.210	0.026	0.009	0.003
Large Bulldozer	0.089	0.011	0.004	0.001
Loaded Trucks	0.076	0.010	0.003	0.001
Jackhammer	0.035	0.004	0.002	0.001
Small Bulldozer	0.003	<0.001	<0.001	<0.001

Source: Derived from Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006, p. 12-12.

The KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (> 36-inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

~~The Monterey Amendment calls for ownership of the Kern Fan Element to be transferred from the Department to the KCWA. The transfer agreement was entered in 1995 and the transfer closed escrow in 1996. The KCWA then transferred ownership to a new agency, the KWBA. The KWBA built a groundwater storage facility, the Kern Water Bank. The primary reason for KWBA's acquisition of the KWB Lands and construction of a Kern Water Bank was to ensure a more reliable water supply for its member entities; storage of water during times of surplus in the service area for later recovery during times of shortage, and use in the service area (see primary water conservation objective of HCP/NCCP¹⁰).~~

~~At the end of 1995, approximately 3,034 acres of shallow percolation ponds existed in the Kern Fan Element. Between 1996 and 2003, as part of the Kern Water Bank, approximately 4,150,080 acres of land were converted to shallow percolation ponds, a six-mile long earthen canal, the Kern Water Bank Canal, and several wells and pump stations were built. In 2009, an additional 70 acres of percolation ponds were constructed, for a total of 7,184 acres.~~ Unpaved roads were built to provide access to the new facilities. However, there were no sensitive uses located in close proximity to the construction sites that were adversely impacted by daytime construction noise and groundborne vibration levels. Routine maintenance of the new facilities results in temporary noise levels. Operation of the ~~KWB Kern Fan Element~~ requires pumping to convey water to percolation ponds, to extract water from underground, and to convey water in the Kern Water Bank Canal. Electric motors power the pumps. A representative range of noise levels for pumps is estimated to be 68 to 72 dBA (see Table 7.12-5) at 50 feet. The installation and operation of pumps associated with the construction of ~~KWB recharge~~ percolation ponds on KWB Lands in the Kern Fan Element attributable to the proposed project ~~would~~ resulted in an increase in noise emissions from pumps compared to pre-1995 conditions. However, increased noise levels ~~would~~ did not affect sensitive receptors because the pumps are located in relatively remote areas far from homes and other sensitive receptors ~~businesses~~. Ongoing maintenance of the new facilities is intermittent and not considered a substantial source of increased noise levels at sensitive land uses.

Therefore, these ~~impact of KWB activities with regard to noise levels was~~ land use changes are ~~were~~ considered to have a ***less-than-significant impact***.

Mitigation Measures

None required.

Future Impacts 2015 – 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) requirements; final locations and areas will be determined as these facilities are designed.

In the future, an additional 1,200 acres of percolation ponds are it is expected to be constructed by that the KWBA would construct an additional 1,200 acres of percolation ponds. The construction-related noise impacts would be are temporary and short-term impacts that and would be considered less than significant. Operation of the Kern Fan Element KWB operations requires pumping to convey water to recharge percolation ponds and to extract water from underground. A representative range of noise levels for electric pumps is estimated to be 68 to 72 dBA (see Table 7.12-5) at 50 feet. If proper mufflers are provided, noise levels could be further reduced. The installation and operation of pumps associated with the operation of recharge percolation ponds during in the KWB activities Kern Fan Element attributable to the proposed project could result in an increase in noise levels. If proper mufflers are provided, noise levels could be reduced. However, even without mufflers, increased noise levels would not affect sensitive noise receptors because the pumps are located in relatively remote

areas far from homes and other sensitive receptors businesses. Additionally, maintenance of the new facilities would occur intermittently and would not constitute a significant increase in area noise levels.

~~Thus, any future such construction and operational activities would be considered to create result in a ***less-than-significant impact***.~~

The KWBA manages lands within the KWB Lands~~Kern Fan Element~~ in accordance with a Habitat Conservation Plan (HCP) and NCCP approved by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game CDFG) in 1997 (see Appendix 7-7a). The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands~~the Kern Fan Element~~. Developed uses include farming, permanent facilities for the KWB~~Water Bank~~, and commerce. Approximately 490 acres of land adjacent to Interstate 5 (I-5) ~~is~~ are designated for possible commercial use. Between 1995 and 2014~~03~~, no development occurred on the 490-acre parcel. ~~Since~~ After 2003, the Settlement Agreement ~~prohibits~~ development of this parcel was prohibited by the Settlement Agreement, and so under the KWB activities~~proposed project~~ the parcel would remain undeveloped. Noise levels at the parcel would be unchanged. Therefore, these land use changes are were considered to have a ***less-than-significant impact***.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to noise levels would be ***less than significant***.

Mitigation Measures

None required.

ENDNOTES

1. Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, December 1998.
2. Federal Highway Administration, *Highway Noise Fundamentals*, United States Department of Transportation, September 1980.
3. Federal Highway Administration, *Highway Noise Fundamentals*, United States Department of Transportation, September 1980.
4. Federal Railroad Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, December 1998.
5. Kern County Planning Department, *Noise Element of the Kern County General Plan*, December 1989.
6. Kern County Planning Department. 2009 (September 22). *Kern County General Plan, Noise Element*. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009.
7. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*, Chapter VII, Noise Element. Bakersfield, CA. Page VII-8.
8. City of Bakersfield. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*, Noise Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Pages VII-9 and VII-10.
9. City of Bakersfield. 2015. Bakersfield Municipal Code, Noise Ordinance. Section 9.22.050, "Noise during Construction."
10. ~~Kern Water Bank Authority (KWBA). 1997. *Habitat Conservation Plan / Natural Community Conservation Plan*. Page S-1.~~

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7.13 CULTURAL AND PALEONTOLOGICAL RESOURCES (NEW)

7.13 CULTURAL AND PALEONTOLOGICAL RESOURCES (NEW)

7.13.1 INTRODUCTION

7.13.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.13 identified potential impacts to cultural and paleontological resources as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.13 that discusses KWB activities. All other text in DEIR Section 7.13 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.13-1A identifies the potentially affected environmental resources from impacts of KWB activities on cultural and paleontological resources.

TABLE 7.13-1A

**IMPACTS OF KWB ACTIVITIES ON CULTURAL AND
PALEONTOLOGICAL RESOURCES**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Monterey Amendment		
Transfer of Kern Fan Element lands, and KWB activities	Damage or destruction of cultural and paleontological resources associated with construction and operation of groundwater storage facilities	7.13-1

During public review of the Notice of Preparation for the Monterey Plus EIR, concerns were raised regarding impacts to resources of cultural significance to Native Americans and sites that occur or may occur within project areas, particularly reservoir fluctuation zones (Patrick Porgans and Associates, March 28, 2002).

7.13.1.2 Analytical Method

Cultural Resources

Archaeological resources evaluated for potential impacts were identified from previous environmental studies, and record searches at the appropriate information centers which are cited in this section. This analysis included a review of the environmental setting, impacts, and mitigation measures related to cultural resources, to the extent that they apply, presented in the 1997 Monterey Initial Study and Addendum for the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP)(see Appendix 7-6a).

Paleontological Resources

Paleontological resources evaluated for potential impacts were identified from previous studies of rock units that underlie project areas, rock units similar to those under the project areas, and previous discoveries. Previous studies that provided information for the analysis are cited in this section. Specific to the KWB Lands, published geological and paleontological literature were reviewed to document the number and locations and previously recorded fossil sites from rock units exposed in and near the project site and vicinity, as well as the types of fossil remains each rock unit has produced. The literature review was supplemented by an archival search conducted at the U.C. Berkeley Museum of Paleontology (UCMP) in Berkeley, California, on April 29, 2015.

Paleontological Resource Assessment Criteria

The potential paleontological importance of a project site can be assessed by identifying the paleontological importance of exposed rock units within the project site. Because the areal distribution of a rock unit can be easily delineated on a topographic map, this method is conducive to delineating parts of a project site that are of higher and lower sensitivity for paleontological resources.

A paleontologically sensitive rock formation is one that has a high potential paleontological productivity rating and is known to have produced unique, scientifically important fossils. The potential paleontological productivity rating of a rock formation refers to the abundance/densities of fossil specimens and/or previously recorded fossil sites in exposures of the same formation. A specific rock formation within a given project site is most likely to yield fossil remains representing particular species in quantities or densities similar to those previously recorded from the formation in other locations.

The tasks listed below were completed to establish the paleontological importance of each rock unit exposed at or near KWB Lands:

- The potential paleontological productivity of each rock formation was assessed, based on the density of fossil remains previously documented within the rock formation.
- The potential for rock formations at the project site to contain unique paleontological resources was considered.

Stratigraphic Inventory

Regional and local surficial geologic mapping and correlation of the various geologic units on KWB Lands and vicinity have been provided at a scale of 1:500,000 by Bartow,¹ 1:250,000 by Croft² (with detailed stratigraphic columns), 1:500,000 by Page³ (with detailed stratigraphic columns), and 1:250,000 by Smith⁴.

Paleontological Resource Inventory and Assessment by Rock Unit

Based on a record search conducted at UCMP, there are no previously recorded fossil localities within KWB Lands.⁵

7.13.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For purposes of this REIR, impacts on cultural and paleontological resources would be considered potentially significant if the KWB activities would:

- cause a substantial adverse change in the significance of a unique archaeological resource or historical resource pursuant to CEQA Guidelines Section 15064.5;
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- disturb any human remains, including those interred outside of formal cemeteries.

7.13.2 ENVIRONMENTAL SETTING

7.13.2.1 Definition of Cultural Resources

For the purposes of this analysis, the term “cultural resources” generally encompasses three broad categories: archaeological resources, historical resources, and Native American ethnic and cultural values and concerns. Archaeological resources are byproducts of human activities, either during prehistoric or historic times, and include human remains. In general, archaeological resources occur at or beneath the ground surface. There are exceptions, however, such as petroglyphs, bedrock milling slicks or mortars, or other features which are visible on exposed rocks. Historical resources are defined by their age and generally refer to events and features associated with Euroamerican settlement, primarily structures or other above-ground remains. A site may be both historical and archaeological, particularly if the materials within the site indicate occupation span long periods of time. The subject of Native American ethnic and cultural values and concerns covers a broad range of resources. Most prominent is the use of sacred and traditional lands by contemporary Native Americans for ceremonies, faunal and botanical resource exploitation, or other traditional activities. These areas often correspond to unrecorded archaeological and/or historical sites, such as rock art or petroglyph sites, or traditional funerary areas. Since the location of sacred and traditional lands or associated activities is often not disclosed, specific location information for many of these areas are unknown.

Geologic units containing fossils (paleontological resources) are present in many locations. Most of the rock units containing fossils are sedimentary rocks. The type and distribution of fossils within a geologic unit provide valuable information that helps expand scientific knowledge about the range of plant and animal species and the ecosystems that were present millions of years ago.

7.13.2.2 Physical Setting in 1995

Archaeological Resources

Since the 1960s, several important studies have been conducted in the southern San Joaquin Valley. Riddell and Olsen's examination of Paleoindian projectile points in private collection from the Tulare Lake basin offered the first evidence of early Holocene use of the region.⁶ Fredrickson and Grossman's excavation of KER-116 for the California Department of Water Resources (Department) also indicated a Paleoindian occupation.⁷ Hartzell's reexamination of the Buena Vista Lake assemblages further refined the cultural chronology for the area,⁸ the results of which were supported by Sutton and Des Lauriers' overview of obsidian research from the southern San Joaquin Valley. To summarize, hydration measurements from localities in the nearby foothills and sites in or adjacent to lakeshore settings suggest exploitation of lacustrine resources was greatest between ca. 2,500 to 1,000 years before present (BP), when those environments were most productive. Prior and subsequent to this time period, hydration readings on obsidian artifacts suggest sporadic exploitation of lakeshore resources.⁹

Numerous cultural chronologies for the southern San Joaquin Valley and nearby regions have been offered by archaeologists, however critical gaps in the extant prehistoric record still exist. Although the cultural sequences differ in some of the details or vary by several hundred years, in general they concur, and identify similar technological and socio-political developments in California prehistory. Currently, the regional cultural sequence is divided into five periods: Paleoindian, Millingstone, Early, Middle, and Late.

Archaeological evidence suggests that California was settled during the **Paleoindian Period** (ca. 12,000-8,000 BP). In the southern San Joaquin Valley, numerous marshes and grassland environments offered early populations opportunities to procure a variety of resources.¹⁰

Assemblages dating to the **Millingstone Period** (ca. 8,500 to 5,500 BP) show similarities to the San Dieguito complex of Southern California, and contain a variety of flaked and cobble tools. Associated fauna from KER-116 reflect a generalized subsistence strategy, which incorporated artiodactyls, lagomorphs, waterfowl, fish, and turtles.¹¹

More definitive evidence of prehistoric populations occurs during the **Early Period** (ca. 5,500 BP to 2,600 BP). Collections from a number of sites in the region typically contain numerous handstones and millingstones, reflecting greater use of seeds and nuts in the diet. Most reconstructions of Early Period economies, however, stress exploitation of faunal resources, such as deer and rodents, or a range of waterfowl and fish species.¹²

An increase in the frequency of ground stone artifacts during the **Middle Period** (ca. 2,600 BP to 1,000 BP) indicates greater reliance on botanical resources than in earlier times. The presence of pestles in addition to handstones and millingstones suggests incorporation of resources such as roots or perhaps acorns, which have higher processing costs. Waterfowl, fresh water fish taxa, and terrestrial fauna remains indicate exploitation of lakeshore and upland territories. Recovery of artifacts manufactured from exotic materials, such as extra-local obsidian, implies trade with other groups from different regions.¹³

Likely ancestral to the ethnohistoric Emigdiano, Castac, Chumash, Tataviam, and Gabrieliño/Tongva cultures, the Late Period (ca. 1,000 to 500 BP) is marked by greater elaboration of social, political, and economic organization. A subsistence strategy based largely on fishing and hunting of marine resources further develops during this time. Affiliations between southern San Joaquin Valley and coastal California groups imply an expansion and intensification of exchange networks during the Late Period.¹⁴

Ethnographic research in the San Joaquin Valley and the lower Sierra Nevada foothills has identified three cultural groups in the area: the Northern Valley, Southern Valley, and Foothill Yokuts. The Southern Valley Yokuts included a large number of distinct small tribes. The traditional Southern Valley Yokuts' territory included the southern end of the San Joaquin Valley and the area around Tulare, Buena Vista, and Kern lakes. Subsistence practices emphasized lacustrine resources, including waterfowl, fish (trout, salmon, chub, perch, and suckers), turtles, mussels, roots, and seeds. Less important were terrestrial fauna, such as tule elk, pronghorn antelope, mule deer, jackrabbits, and ground squirrels.¹⁵

Early European exploration of the area and the advent of missions did not affect the Southern Valley Yokuts as much as it did tribes in other areas. In 1833, however, an outbreak of malaria took an estimated 75 percent of the native population. Subsequent annexation of California severely affected the Southern Valley Yokuts, as they were displaced and their land settled by immigrants.¹⁶

In the recent past, KWBA has cooperated with the Tinoqui-Chalola Council of Kitanemuk & Yowlumne Tejon Indians to allow the annual spirit walk to include walking across KWB Lands as part of the route from Beach Park to the Tule Elk State Natural Reserve.¹⁷

Paleontological Resources

The surficial geologic formations under KWB Lands are shown in Figure 7.13-1. Based on a review of geologic mapping, Younger Alluvium, Basin Deposits, and Stream Terrace Deposits are exposed at the surface of the KWB Lands.^{18,19,20} These formations are underlain by Older Alluvium and Stream and Terrace Deposits, which are in turn underlain by the Tulare Formation. Each of these geologic formations is discussed in further detail below.

Alluvium/Flood Basin Deposits/Stream Terrace Deposits

These formations are of Holocene age (i.e., 11,700 years Before Present [B.P.] to Present Day). The younger alluvium generally consists of discontinuous beds of clay, silt, sand, and gravel. In the KWB area, the alluvium is finer grained and less permeable as it grades into fine-grained flood basin deposits underlying the historic beds of Buena Vista and Kern Lakes. The flood basin deposits consist of silt, silty clay, sandy clay, and clay interbedded with poorly permeable sand layers. The stream terrace deposits consist of sediments deposited along river channels and major streams, poorly sorted, from clay to boulder sized. The total thickness of these units may range from 150–1,000 feet.^{21,22,23}

Alluvium/Stream and Terrace Deposits

These geologic formations are composed of up to 250 feet of Pleistocene-age (i.e., 2.6 million to 11,700 year B.P.) lenticular deposits of clay, silt, sand, and gravel that are loosely consolidated to cemented.^{24,25}

Tulare Formation

The Tulare Formation is composed of continental rocks and alluvial fan, deltaic, flood plain, lake, and marsh deposits. The formation is of late Pliocene—early Pleistocene age. In the southwestern part of the San Joaquin Valley, the Tulare Formation may comprise up to 4,000 feet of sedimentary deposits. The lithology of the Tulare formation varies from place to place, depending on the kind of material that furnished the sediments and the conditions under which they were laid down; however, it generally contains unconsolidated clay, silt, sand, and gravel.^{26,27}

By the end of the late Pliocene/early Pleistocene epochs, the ancient drainage way from the San Joaquin Valley to the ocean had closed, and the resulting impoundment of water formed a large lake as evidenced by the Corcoran Clay member of the Tulare Formation. The Corcoran Clay is present below the surface from the Kern River outlet channel on the west through the central and much of the eastern subbasin at depths of 300–650 feet.^{28,29}

The Corcoran Clay is generally very fine grained; however, isolated, coarser zones are apparent from well drilling logs, particularly where the clay is less than 20 feet thick. Although the Corcoran Clay is generally conceptualized as a single, continuous layer of very low hydraulic conductivity, detailed analyses of well drilling logs show that the Corcoran clay zone is not homogeneous. In some areas it is better characterized as a zone of multiple clay layers interbedded with more permeable materials.³⁰

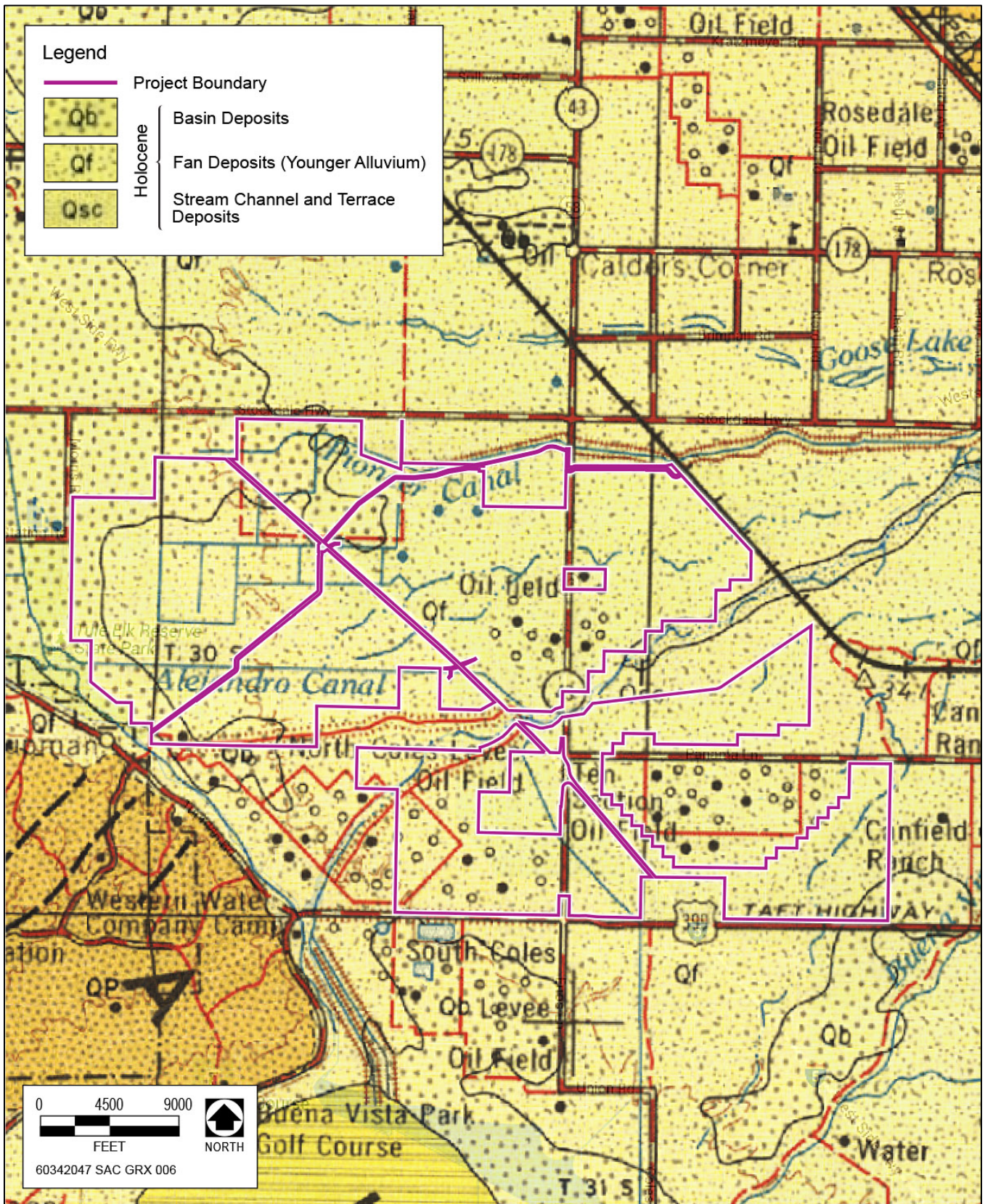
A search of the UCMP database indicates that vertebrate fossils have been recovered from the Tulare Formation from two localities in Kern County. One of those locations (V-6810) is within the Elk Hills, the eastern extent of which lies approximately 0.5 mile west of KWB Lands. This locality yielded specimens of *Equus occidentalis* (Western horse).³¹ The UCMP database indicates that 8 other localities in Kings County yielded vertebrate fossils from the Tulare Formation.³²

Croft³³ indicates that Pleistocene-age vertebrate fossils have been recovered from the Corcoran Clay member of the Tulare Formation at two locations. Teeth of an *Equus* (Irvingtonian or Rancholabrean age) were found in 1954 an excavation of the Madera Canal. In 1964, vertebrate remains in the Corcoran Clay were exposed by the San Canal excavation, about 15 miles northwest of Mendota. The fauna were determined to be either of middle Pleistocene (Irvingtonian) age or late Pleistocene (Rancholabrean) age.

In the Kettleman Hills—approximately 80 miles north of the project site in Kings County—hundreds of sand dollars, scallops, clams, and various fresh water mollusks (among other specimens) have been recovered from the Tulare Formation. The collection recorded by Woodring, et al.³⁴ includes 33 species of fresh water mollusks, 23 species of gastropods, and 10 species of pelecypods, in addition to 136 species of diatoms, two species of ostracodes, a horse, and miscellaneous fish.

In addition to vertebrate fossils, Page³⁵ presented reports from several other authors indicating the Tulare Formation contains specimens of the freshwater clams *Anodonta* and *Sphaerium kettlemanense*, the freshwater and brackish-water snail *Amnicola*, and the freshwater snails *Fluminicola*, *Planorbis*, *Pyrgulopsis*, *Valvata*, *Lithoglyphus*, and *Seminalis*.

Because of the large number of fossils that have been recovered from the Tulare Formation, it is considered to be of high paleontological sensitivity.



Source: Smith 1964³⁶

Figure 7.13-1. Surficial Geologic Formations at the Kern Water Bank Site

Younger Alluvium/Flood Basin Deposits/Younger Stream and Terrace Deposits

The younger alluvium, flood basin deposits, and younger stream and terrace deposits are of Holocene age. To be considered a unique paleontological resource, a fossil must be more than 11,700 years old. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered “unique” paleontological resources. Therefore, these formations are not considered to be paleontologically sensitive.

Older Alluvium/Stream and Terrace Deposits

The older alluvium and older stream and terrace deposits are of Pleistocene age. The Pleistocene epoch, known as the “Great Ice Age,” began approximately 2.6 million years ago. On the basis of Savage’s³⁷ survey of vertebrate fauna from the nonmarine late Cenozoic deposits of the San Francisco Bay region, he concluded that two major divisions of Pleistocene-age fossils could be recognized: the Irvingtonian (older Pleistocene fauna) and the Rancholabrean (younger Pleistocene and Holocene fauna). These two divisions of Quaternary Cenozoic vertebrate fossils are widely recognized today in the field of paleontology. The age of the later Pleistocene, Rancholabrean fauna was based on the presence of bison and on the presence of many mammalian species that are inhabitants of the same area today. In addition to bison, larger land mammals identified as part of the Rancholabrean fauna include mammoths, mastodons, camels, horses, and ground sloths.

Remains of vertebrate fossils have been found at several localities in older alluvium and stream and terrace deposits related to similar deposits at the KWB site. Excavations for the Arvin landfill approximately 25 miles southeast of KWB Lands (UCMP locality V-93068), which occurred in older alluvium, resulted in the recovery of 32 specimens from 9 different species (*Microtus*, *Neotoma*, *Canidae*, *Dipodomys*, *Thomomys*, *Squamata*, *Equus*, *Hyla*, and *Leporidae*).³⁸

A deposit of Pleistocene mammals from older alluvium was reported by Cogstone³⁹ approximately 4.5 miles east of KWB Lands. This site yielded specimens of horse, deer, pronghorn, muskrat, seven kinds of rodents, two kinds of rabbits, bat, snake, bird, lizard, turtle, frog/toad, and a freshwater bivalve.

Jefferson^{31,32} compiled a database of California late Pleistocene vertebrate fossils from published records, technical reports, unpublished manuscripts, information from colleagues, and inspection of paleontological collections at more than 40 public and private museums. Jefferson indicates that a recorded locality in the vicinity of Maricopa/Pentland, approximately 15 miles southwest of KWB Lands, yielded specimens from 46 different Rancholabrean-age species of lower nonmarine and avians, and 27 species of mammals, from older alluvial fan deposits. Jefferson also indicates that UCMP localities 1370, 1386, 7139, and 34001 all originated within the McKittrick Oil Field holdings west of KWB Lands, and have yielded specimens from over 70 Rancholabrean-age and younger species of lower nonmarine and avians, and 45 species of mammals.

In addition to the above, seven other UCMP localities have yielded Rancholabrean fauna from Pleistocene alluvial sediments in Kern County. Vertebrate specimens recovered included species of horse, bison, and rodent.⁴⁰

Because of the large number of vertebrate fossils that have been recovered from the older alluvium and stream and terrace deposits, these formations are considered to be of high paleontological sensitivity.

7.13.2.3 Changes in Physical Setting between 1996 and 2014

The nature and types of cultural resources present generally do not change and, therefore, the environmental setting described under 1995 conditions would be the same under 1996–2014 conditions.

7.13.2.4 Regulatory Setting in 1995

The treatment of cultural resources is governed by federal, State, and local laws and guidelines. There are specific criteria for determining whether prehistoric and historic resources or objects, and traditional cultural sites are significant and/or protected by law. Federal and State significance criteria generally focus on the resource's integrity and uniqueness, its relationship to similar resources, and its potential to contribute important information to scholarly research. Some resources that do not meet federal significance criteria may be considered significant by State criteria. The laws and regulations seek to lessen impacts on significant prehistoric or historic resources. The federal, State, and local laws and guidelines for protecting historic resources are summarized below.

Federal

Federal laws for cultural resources are governed primarily by Section 106 of the National Historic Preservation Act of 1966 (amended in 1999 and 2014). The Code of Federal Regulations Title 36 includes specific information on the protection of historic resources. A historic property is defined to mean any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties, as well as localities that are of traditional religious and/or cultural importance to a Native American tribe or Native Hawaiian organization.

State

Archaeological Resources

CEQA and the State CEQA Guidelines also require lead agencies to consider whether projects will affect archaeological resources (Public Resources Code [PRC] Section 21083.2 and California Code of Regulations [CCR] Section 15064.5[c]). If an archaeological site is a historical resource meeting one of the above criteria, agencies shall follow the provisions of PRC Section 21084.1. If, however, an archaeological site does not meet these criteria, but does meet the definition of a “unique archaeological resource” as defined in PRC Section 21083.2(g), the resource must be considered under CEQA in compliance with PRC Section 21080.1. An unique archaeological resource is defined in PRC Section 21083.1(g) as “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; or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.”

Native American Burials

California law protects Native American burials, skeletal remains and associated grave goods regardless of their antiquity and provides for the sensitive treatment and disposition of those remains (California Health and Safety Code Section 7050.5, California PRC Sections 5097.94 *et seq.*). Section 7050.5(b) of the California Health and Safety code specifies protocol when human remains are discovered. These requirements have been incorporated into Section 15064.5(e) of the CEQA Guidelines.

Historical Resources

CEQA requires public agencies to consider the effects of proposed projects on both “historical resources” and “unique archaeological resources.” Pursuant to PRC Section 21084.1, 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.” Section 21083.2 of the PRC also requires agencies to determine whether a proposed project would have a significant effect on “unique archaeological resources.” Section 15064.5 of the State CEQA Guidelines (CCR Title 14, Chapter 3) provides additional guidance on how agencies are to determine the significance of impacts on historical and archaeological resources. Pending future evaluation of cultural resources against the criteria noted below, resources will be managed as though eligible.

Section 15064.5 of the State CEQA Guidelines defines a “historical resource” as a resource that meets at least one of the following three criteria:

- A resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR), as defined in PRC Section 5024.1 and CCR Section 4850 *et seq.*;
- 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 resources survey meeting the requirements of PRC Section 5024.1(g) – unless the preponderance of evidence demonstrates that it is not historically or culturally significant; or
- Any object, building, structure, site, area, place, record, or manuscript which 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.

PRC Section 21084.1 and Section 15064.5 (a)(4) also acknowledge that even if a resource does not meet the above criteria, this fact shall not preclude a lead agency from determining that the resources may be a historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

The CRHR was created in 1992 and is intended as an authoritative listing of the State’s significant historical and archaeological resources (PRC Section 5024.1 and CCR Section 4852). The criteria for listing in the CRHR (codified in PRC Section 5024.1 and clarified in CCR Section 4852) are intended to serve as the definitive criteria for assessing the significance of historical resources for purposes of CEQA.

By definition, the CRHR includes the following resources:

- Listed in the NRHP,
- Formally determined eligible for listing in the NRHP,

- California Historical Landmarks beginning with #770, and
- California Points of Historical Interest beginning with those designated in January 1998.

The second category of “historical resources” under PRC Section 21084.1 includes those “deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1.” Subdivision (g) of the statute provides that a resource identified as significant in a historical survey may be listed in the CRHR if the survey meets all of the following criteria:

- The survey has been or will be included in the State Historic Resources inventory;
- The survey and the survey documentation were prepared in accordance with procedures and requirements of the State Office of historic Preservation;
- The resource is evaluated and determined to have a significance rating of Category 1 to 5 on the DPR Historic Resources Inventory Form; and
- If the survey is 5 years or older at the time of its nomination for inclusion in the CRHR, the survey is updated to identify historical resources which have become eligible or ineligible due to changed circumstances, or further documentation is provided on those resources which have been demolished or altered in a manner that substantially diminished the significance of the resource.

A resource is presumed to constitute an “historical resource” if it is included in a “local register of historical resources” meeting the above criteria, unless “the preponderance of evidence demonstrates that it is not historically or culturally significant” (CCR Section 15064.5[a][2]).

In addition to assessing whether historical resources potentially affected by a proposed project are listed in the CRHR or have been identified in a survey process meeting the requirements of PRC Section 5024.1(g), lead agencies have a responsibility to evaluate resources against the CRHR criteria for eligibility before making a finding as to a proposed project’s impacts on historical resources (PRC Section 21084.1; CCR Section 15064.5[a][3]). A resource shall be considered historically significant if it is significant at the local, state, or national 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 value; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be determined eligible for listing in the CRHR, it must be historically significant and retain enough of its historic character or appearance to be recognizable as a historic resource and to convey the reasons of its significance. “Integrity” is defined as the retention of the resource’s physical identify that existed during its period of significance. Integrity is determined by considering the location, design, setting, materials, workmanship, feeling, and association of the resource.

California Public Resources Code Section 5097.5

Unauthorized collection of fossils on land under state ownership or jurisdiction is considered a misdemeanor, punishable by fine and/or imprisonment. PRC Section 5097.5 states:

A person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

Professional Paleontological Standards

The Society of Vertebrate Paleontology (SVP), a national scientific organization of professional vertebrate paleontologists, has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, mitigation, data and fossil recovery, sampling procedures, specimen preparation, analysis, and curation.⁴¹

In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, SVP⁴² established three categories of sensitivity for paleontological resources: high, low, and undetermined. Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas that have not had any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys and mapping are performed to determine their sensitivity. All vertebrate fossils are generally categorized as being of potentially significant scientific value.

Local

General Plans

General Plans of the various counties and cities of the State of California contain goals and policies aimed at protecting cultural resources in the region.

Kern County

The *Kern County General Plan* includes extensive reviews of archaeological research, history, and ethnography in the county, and Native American concerns are noted (especially in regard to cemeteries). The appropriateness of using Native American monitors is indicated. The Plan notes that impacts may occur when development takes place without consideration of important resources, and it notes the prudence of using inventories and avoiding impacts to sites by various means.

7.13.2.5 Changes in Regulatory Setting between 1996 and 2014

Federal

Revisions to 36 CFR 800 were made in January 2001 and in August 2014 call for a significant increase in Native American consultation in the Section 106 process. Native American Tribes must now be consulted at all phases of work, including eligibility of prehistoric sites, which was not previously required.

State

California Senate Bill 297

This bill addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and

establishes the Native American Heritage Commission to resolve disputes regarding the disposition of such remains. It has been incorporated into Section 15064.5(e) of the State CEQA Guidelines.

California Natural Resources Agency Tribal Consultation Policy (2012)

The California Natural Resources Agency Tribal Consultation Policy was adopted pursuant to Executive Order B-10-11 requiring State departments to implement effective government-to-government consultation with California Indian Tribes so that Indian tribes and tribal communities can provide meaningful input into the development of projects, plans, and other activities that may affect tribal communities.

California Assembly Bill 52

Assembly Bill 52 was approved and chaptered into CEQA in September 2014. This law defines a new category of cultural resources that requires evaluation under CEQA Appendix G, Section V (Cultural Resources). Under this new legislation, a project that may cause a substantial adverse change in the significance of a tribal cultural resource would be a project that may have a significant effect on the environment. The law also requires lead agencies to consult with tribes on projects for which tribes request consultation.

The requirements of Assembly Bill 52 went into effect on July 1, 2015, and are applicable only to those projects that have a Notice of Preparation, Negative Declaration, or Mitigated Negative Declaration filed on or after that date. Therefore, KWB activities are not subject to the requirements of the law because the DEIR Notice of Preparation was issued in January 2003.

Local Plans

Metropolitan Bakersfield General Plan, Land Use Element

The *Metropolitan Bakersfield General Plan* (adopted in 2002 and amended in 2007) Land Use Element lists the following general policies that would be applicable to KWB activities:⁴³

- **Policy 104:** As part of the environmental review procedure, an evaluation of the significance of paleontological, archaeological, and historical resources and the impact of proposed development on those resources shall be conducted and appropriate mitigation and monitoring included for development projects.
- **Policy 105:** Development on land containing known archaeological resources (i.e., high sensitivity areas) shall utilize methodology set forth, as described necessary by a qualified archaeologist, to locate proposed structures, paving, landscaping, and fill dirt in such a way as to preserve these resources undamaged for future generations when it is the recommendation of a qualified archaeologist that said resources be preserved in situ.
- **Policy 106:** The preservation of significant historical resources as identified on Table 4.10-1 shall be encouraged by developing and implementing incentives such as building and planning application permit fee waivers, Mills Act contracts, grants and loans, implementing the State Historic Building Code and other incentives as identified in the City's Historic Preservation Ordinance.
- **Policy 107:** The preservation of significant historical resources shall be promoted and other public agencies or private organizations shall be encouraged to assist in the purchase and/or relocation of sites, buildings, and structures deemed to be of historical significance.

No specific implementation measures are assigned to these policies, other than the following measure, which calls for following the requirements of the CEQA Guidelines:

- **Implementation Measure 7: Environmental Review.** Local guidelines for project processing shall reflect California Environmental Quality Act (CEQA) Guidelines which state that the environmental effects of a project must be taken into account as part of project consideration.⁴⁴

The 2007 general plan update reserved a chapter (Chapter XIII) for a Historical Resources Element,⁴⁵ but policies and goals for cultural resources have not yet been developed.

Kern County General Plan

The following policy and implementation measures related to cultural resources from the Land Use, Open Space, and Conservation Element of the *Kern County General Plan* (adopted in 2004 and amended in 2009) would be applicable to KWB activities.^{79,80}

- **Policy 25:** The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.
 - **Implementation Measure K:** Coordinate with the California State University, Bakersfield's Archaeology Inventory Center.
 - **Implementation Measure L:** The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).
 - **Implementation Measure N:** The County shall develop a list of Native American organizations and individuals who desire to be notified of proposed discretionary projects. This notification will be accomplished through the established procedures for discretionary projects and CEQA documents.
 - **Implementation Measure O:** On a project specific basis, the County Planning Department shall evaluate the necessity for the involvement of a qualified Native American monitor for grading or other construction activities on discretionary projects that are subject to a CEQA document.

7.13.3 IMPACTS AND MITIGATION MEASURES

7.13-1 KWB activities could potentially result in damage and/or destruction of cultural and paleontological resources.

1996 — 2014

The KWB facilities include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. The ponds consist of low earthen berms that pond water to depths of a few feet. The ponded water infiltrates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; KWBA operators control the flow with small weir boxes. The recovery wells average about 750 feet deep and produce as much as 5,000 gallons per minute of water. They are distributed throughout the KWB Lands and are spaced approximately one-third mile apart. The 16- to 20-inch-diameter wells are powered with electric motors. Small diameter (15- to 36-inch-diameter) PVC pipelines transport water recovered from wells to existing canals or, in some cases, to large diameter (> 36 inch-diameter) pipelines. Approximately 31 miles of small-diameter and 5 miles of large-diameter pipeline have been constructed.

The KWB Canal was constructed to convey water both to the water bank ponds for recharge purposes and from the water bank wells for recovery purposes. The canal extends 6 miles from the Kern River on the east to the California Aqueduct on the west. Associated structures include headworks at the Kern River, a 100 cubic feet per second (cfs) pump station serving the Kern River area, a crossing under Enos Lane, a check structure, a 545 cfs pump station serving the eastern portions of the KWB, and diversion facilities at the California Aqueduct.

Between 1996 and 2014, maintenance and operational activities included the replacement of recovery wells and the servicing and maintenance of all wells involved in groundwater recovery. Periodic berm repair and mowing of the KWB Canal banks to control excessive vegetation growth were ongoing maintenance activities. Existing fencing was maintained and additional fencing installed as needed. Other management activities included trash cleanup and removal of illegally dumped materials, environmental cleanup, and monitoring of third-party operations and cleanup activities.^{46,47,48,49,50,51,52} No previously unidentified archaeological resources were identified during KWB activities during 1996-2014 with the exception of isolates such as chert flakes and mano.^{53,54,55} Furthermore, only historical isolates such as glass and ceramics have been found during KWB activities during 1996-2014.⁵⁶

As discussed previously, prehistoric sites have been recorded on KWB Lands and paleontological deposits have been identified in the southern portion of the county. Some of these deposits are exposed while others are underground. Ground disturbance associated with the construction of groundwater storage facilities could expose paleontological resources. Prior to construction, archaeological investigations were completed in the Kern Fan Element and for the KWB Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). Some of these investigations recorded significant archaeological sites at or near KWB Lands.⁵⁷ Known cultural sites were avoided and no new cultural sites were discovered during ground-disturbing construction activities during 1996-2014. Mitigation measures were adopted to avoid and/or preserve existing cultural sites and to ensure that if previously unidentified archaeological resources were discovered during construction activities, that work would cease and a qualified archaeologist would examine the discovery and make recommendations for appropriate data recovery.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to cultural resources was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed. KWBA has also issued a Notice of Preparation in 2012 for the proposed Kern Water Bank Conservation and Storage Project, which would use existing facilities to divert water from the Kern River to increase reliability and enhance the dry-year water supply of KWBA's participating members through storage in the KWB. No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants already have facilities in place to convey and exchange recovered water.

In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place.⁵⁸

The KWB HCP/NCCP allows developed uses on about 4,000 acres of KWB Lands.⁵⁹ Developed uses include farming, permanent facilities for the KWB, and commerce. Approximately 490 acres are designated for possible commercial use. Between 1996 and 2014, no development occurred on the 490-acre parcel. The Settlement Agreement prohibits development of this parcel, so with KWB activities the parcel would remain undeveloped.

As a consequence of KWB activities, approximately 1,052 acres of land would be converted to recharge ponds and three wells constructed between 2015 and 2030. Construction of recharge ponds and associated berms could expose cultural resources to damage and/or destruction.

As shown in Figure 7.13-1 and discussed previously, the surface of KWB Lands is covered with Holocene-age basin and alluvial sediments. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered “unique” paleontological resources. Therefore, these formations are not considered to be paleontologically sensitive. Because these formations extend from 150 to 1,000 feet below the ground surface on KWB Lands, most of the proposed KWB activities would have no effect on unique paleontological resources. However, well depths on KWB Lands range from 300 to 1,400 feet below the ground surface. Therefore, well drilling and refurbishing activities associated with groundwater recharge, extraction, and monitoring may occur in the Older Alluvium, Older Stream and Terrace Deposits, and Tulare Formation. Because of the number of vertebrate fossils that have been recovered from these formations, they are considered paleontologically sensitive.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to cultural resources and unique paleontological resources could be **potentially significant**.

Mitigation Measures

Mitigation Measure 7.13-1a would reduce potentially significant impacts of KWB activities to cultural resources to less than significant. KWBA is obligated to carry out Mitigation Measure 7.13-1a (see Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, KWB activities from 2015 to 2030 with regard to cultural resources would be **less than significant, with mitigation**.

Mitigation Measure 7.13-1b would reduce potentially significant impacts of KWB activities on unique paleontological resources to less than significant. KWBA is obligated to carry out Mitigation Measure 7.13-1b (see Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, KWB activities with regard to unique paleontological resources would be **less than significant, with mitigation**.

7.13-1a *KWBA will implement the following measures to minimize potential adverse impacts on cultural resources (see Appendix 7-6b, 2016 KWBA Resolution):*

- a) *Prior to ground disturbance for new pond or well construction and associated facilities, an analysis to identify the potential presence of archaeological resources on the project site shall be conducted. The analysis shall include, at a minimum, a records check and literature survey from the appropriate California Historical Resources Information System (CHRIS) center and a Phase I Cultural Resources Investigation by an archaeologist meeting the Secretary of the Interior’s Standards. If resources are known to exist on a project site, the analysis shall include an assessment of the resource and shall include measures for the in-situ protection, or the recovery, preservation, study, and curation of*

the resource, as appropriate. The analysis and the measures developed shall be consistent with the practices and intent described in Section 21083.2 et seq. of the Public Resources Code, as well as Sections 15064.5 et seq. and 15126.4(b) of the California Code of Regulations, and shall be consistent with current professional archaeological standards. The archaeologist shall prepare a report of the results of any study prepared, following accepted professional practice. Copies of the report shall be submitted to the KWBA and to the appropriate CHRIS information center. KWBA shall also consult, as appropriate, with the Native American Heritage Commission and appropriate Native American tribal representatives to address Native American cultural values with respect to archaeological contexts and places of traditional use or importance.

- b) *As a condition of all contracts for new pond or well construction and associated facilities and prior to ground-disturbing activities, all earth-moving and excavation contractor employees shall attend an orientation session informing them of the potential for inadvertently discovered cultural resources and/or human remains and protection measures to be followed to prevent destruction of any and all cultural resources discovered on site. The applicant's designated project construction manager, a qualified archaeologist, and a qualified cultural resource manager/monitor from a local California Native American tribe shall conduct the orientation (unless the local tribe opts not to participate). The orientation will include information regarding the potential for objects to occur on site, a summary of applicable environmental law, procedures to follow if potential cultural resources are found, and the measures to be taken if cultural resources and/or human remains are unearthed as part of the project.*
- c) *Construction areas for new ponds and wells and associated facilities shall be staked prior to earthmoving by a qualified archaeologist in consultation with the contractor to indicate the construction area, construction staging area, and buffer. No earthmoving, parking, or materials storage will be allowed outside the staked areas. Prior to construction, the archaeologist shall survey the area to identify any surface artifacts within the staked area. An archaeologist and qualified cultural resource manager/monitor from a local California Native American tribe (unless the local tribe opts not to participate) shall be present during any grubbing or topsoil grading within the staked area. If previously unknown buried cultural resources, such as flaked or ground stone, historic debris, building foundations, or nonhuman bone (unless determined to be from present day grazing operations), are discovered during ground-disturbing activities, work will stop in that area and within an appropriate buffer area, as determined by the archaeologist. The archaeologist shall assess the significance of the affected cultural resources and, if necessary, develop feasible and appropriate treatment measures in consultation with the project staff, such as avoidance, capping with geotextile and fill, or Phase III data recovery consistent with applicable standards adopted pursuant to the National Historic Preservation Act.*
- d) *In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately, the area of the find shall be protected, and KWBA immediately shall notify the County Coroner of the find and comply with the provisions of PRC Section 5097 with respect to Native American involvement, burial treatment, and re-burial, if necessary.*

- 7.13-1b.** *KWBA will implement the following measures to minimize potential adverse impacts on previously unknown potentially unique, scientifically important paleontological resources: (see Appendix 7-6b, 2016 KWBA Resolution):*
- a) *Before the start of any well-drilling activities, KWBA shall retain a qualified paleontologist or other qualified individual to train all personnel involved with earthmoving and/or well drilling activities regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered (this training can take place at the same time as the orientation required by 7.13-1a).*
 - b) *In the event that paleontological resources are discovered, KWBA will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. If fossil or fossil bearing deposits are discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist will notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If KWBA determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to KWBA for review and approval prior to implementation. The analysis and measures developed shall be consistent with the Conformable Impact Mitigation Guidelines developed by the Society of Vertebrate Paleontology and current professional paleontological standards.*

ENDNOTES

1. Bartow, J.A. 1991. The Cenozoic Evolution of the San Joaquin Valley, California. U.S. Geological Survey Professional Paper 1501. Washington, D.C.
2. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.
3. Page, R.W. 1986. *Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections*. U.S. Geological Survey Professional Paper 1401-C. Washington, DC.
4. Smith, A.R. 1964. *Geologic Map of California Bakersfield Sheet*. California Division of Mines and Geology. Sacramento, CA.
5. University of California Museum of Paleontology. 2015. Paleontological Collections Database.
6. Riddell, F. A., and W. E. Pritchard. 1969. "An Early Man Site in the San Joaquin Valley, California." *American Antiquity* 34(2):21–130.
7. Fredrickson, D. A., and J. Grossman. 1966. *Radiocarbon Dating of an Early Site at Buena Vista Lake, California*. Paper presented at the Annual meeting of the Society for American Archaeology, Reno, NV.
8. Hartzell, L. 1992. *Hunter-Gatherer Adaptive Strategies and Lacustrine Environments in the Buena Vista Lake Basin, Kern County, California*. Unpublished dissertation, University of California, Davis.
9. Erlandson, J. M. 1997. "The Middle Holocene along the California Coast." In J. E. Arnold, ed., *Archaeology of the California Coast during the Middle Holocene*, pages 1–10. Los Angeles: Regents of the University of California.
10. Fredrickson, D. A., and J. Grossman. 1966. *Radiocarbon Dating of an Early Site at Buena Vista Lake, California*. Paper presented at the Annual meeting of the Society for American Archaeology, Reno, NV.
11. King, C. 1990. *Evolution of Chumash Society*, New York: Garland Publishing.
12. Hartzell, L. 1992. *Hunter-Gatherer Adaptive Strategies and Lacustrine Environments in the Buena Vista Lake Basin, Kern County, California*. Unpublished dissertation, University of California, Davis.
13. Hartzell, L. 1992. *Hunter-Gatherer Adaptive Strategies and Lacustrine Environments in the Buena Vista Lake Basin, Kern County, California*. Unpublished dissertation, University of California, Davis.
14. Moratto, M. J. 1984. *California Archaeology*. Orlando, FL: Academic Press.
15. Wallace, W. J. 1978. "Southern Valley Yokuts." In R. F. Heizer, ed., *Handbook of North American Indians*, Vol. 8, California, pages 448–461. Washington, DC: Smithsonian Institution.

16. Wallace, W. J. 1978. "Southern Valley Yokuts." In R. F. Heizer, ed., *Handbook of North American Indians*, Vol. 8, California, pages 448–461. Washington, DC: Smithsonian Institution.
17. Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Report and 2005–2006 Management Plan*. Bakersfield, CA.
18. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.
19. Woodring, W.P., R. Stewart, and R.W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.
20. Page, R. W. 1983. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin County, California, with a Section on Ground-Water Management Considerations and Use of Texture Maps*. U.S. Geology Water-Resources Investigations Technical Report 83-4000. Sacramento, CA.
21. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.
22. Woodring, W.P., R. Stewart, and R.W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.
23. Page, R. W. 1983. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin County, California, with a Section on Ground-Water Management Considerations and Use of Texture Maps*. U.S. Geology Water-Resources Investigations Technical Report 83-4000. Sacramento, CA.
24. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.
25. Woodring, W.P., R. Stewart, and R.W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.
26. Page, R. W. 1983. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin County, California, with a Section on Ground-Water Management Considerations and Use of Texture Maps*. U.S. Geology Water-Resources Investigations Technical Report 83-4000. Sacramento, CA.
27. Smith, A.R. 1964. *Geologic Map of California Bakersfield Sheet*. California Division of Mines and Geology. Sacramento, CA.
28. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.

29. Woodring, W.P., R. Stewart, and R.W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.
30. Page, R.W. 1986. *Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections*. U.S. Geological Survey Professional Paper 1401-C. Washington, DC.
31. University of California Museum of Paleontology. 2015. Paleontological Collections Database.
32. University of California Museum of Paleontology. 2015. Paleontological Collections Database.
33. Croft, M.G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.
34. Woodring, W.P., R. Stewart, and R.W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.
35. Page, R. W. 1983. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin County, California, with a Section on Ground-Water Management Considerations and Use of Texture Maps*. U.S. Geology Water-Resources Investigations Technical Report 83-4000. Sacramento, CA.
36. Smith, A.R. 1964. *Geologic Map of California Bakersfield Sheet*. California Division of Mines and Geology. Sacramento, CA.
37. Savage, D.E. 1951. Late Cenozoic Vertebrates of the San Francisco Bay Region. University of California Publications, Bulletin of the Department of Geological Sciences 28(10):215–314.
38. University of California Museum of Paleontology. 2015. Paleontological Collections Database.
39. California Department of Transportation. 2011 (May). Paleontological Resources: Paleontological *Identification and Evaluation Report and Mitigation Plan for State Route 178 Widening Project*. Prepared by Cogstone Resource Management, Inc. Orange, CA.
40. University of California Museum of Paleontology. 2015. Paleontological Collections Database.
41. Society of Vertebrate Paleontology. 2016. Guidelines from the Ethics Education Committee for Collecting, Documenting and Curating Fossils. Available: <http://vertpaleo.org/The-Society/Governance-Documents/Guidelines-from-the-Ethics-Education-Committee-for.aspx>.
42. Society of Vertebrate Paleontology. 1995 (January). *Society for Vertebrate Paleontology News Bulletin*, Number 163. http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F9331215932%7D/uploads/SVP_1995.pdf.
43. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Metropolitan Area)*, Land Use Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Pages II-18 to II-19.

44. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Metropolitan Area)*, Land Use Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Page II-21.
45. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Metropolitan Area)*, Table of Contents. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Page i.
46. Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA. Pages 2 and 45–53.
47. Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA. Pages 5 and 22–32.
48. Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA. Pages 5, 8, and 31–39.
49. Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA. Pages 4, 7, and 23–28.
50. Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA. Pages 9 and 25.
51. Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA. Pages 7 and 25.
52. Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA. Pages 7 and 25.
53. Pruett, C.L. 1997. Addendum 1: Emergency Flood Area. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California. *Three Girls and a Shovel*, Bakersfield, CA.
54. Murphy, P. G. 1999. *Addendum V: Four New Berm Sites [location redacted]. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California*. Three Girls and a Shovel, Bakersfield, CA.
55. Pruett, C. L. 1999. *Addendum VI: A Cultural Resources Assessment for New Berms [location redacted]. Kern County, California*. Three Girls and a Shovel, Bakersfield, CA.
56. Pruett, C.L. 1997. Addendum 1: Emergency Flood Area. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California. *Three Girls and a Shovel*, Bakersfield, CA.

57. Kern Water Bank Authority. 1997 (October). *Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, Volume II, Environmental Assessment*. Pages 52 and 53.
58. Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Page 25.
59. Kern Water Bank Authority. 1997 (October). *Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan*.

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7.14 PUBLIC SERVICES AND UTILITIES (NEW)

7.14 PUBLIC SERVICES AND UTILITIES (NEW)

7.14.1 INTRODUCTION

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the "Kern Fan Element property" in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.14 identified potential impacts to public services and utilities as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, that replaces text from DEIR Section 7.14 that discusses KWB activities. All other text in DEIR Section 7.14 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts. Impacts on water supply are described in Section 7.1, Surface Water and Groundwater Hydrology. Impacts on energy use are described in Section 7.16, Energy.

Table 7.14-1 identifies the potentially affected environmental resources from impacts of KWB activities on public services and utilities.

TABLE 7.14-1**IMPACTS OF KWB ACTIVITIES ON PUBIC SERVICES AND UTILITIES**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Changes in public services and utility capacity associated with construction and operation of groundwater storage facilities	7.14-1

During public review of the Notice of Preparation for the Monterey Plus EIR, interested parties submitted no comments related to public services and utilities.

7.14.1.1 Analytical Method

Effects on utilities and public services were identified by comparing existing service capacity and facilities against KWB activities and the ability of a service provider to continue to provide a level of service that would meet public needs. The evaluation of potential impacts on public services and utilities was based largely on a review of KWBA's annual compliance and management reports. Additional background information on current services was obtained through consultation with KWBA staff and other appropriate agencies.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to public services and utilities, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.14.1.2 Standards of Significance

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For purposes of this REIR, impacts on public services and utilities would be considered potentially significant if the KWB activities would:

- result in substantial adverse physical impacts resulting from the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other public facilities;
- substantially exceed wastewater treatment requirements or require construction of new water or wastewater treatment facilities, storm water facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- generate enough solid waste to exceed landfill capacity or substantially shorten the life of a landfill.

7.14.2 ENVIRONMENTAL SETTING

7.14.2.1 Physical Setting in 1995

Fire Protection

Fire protection services are provided by the Kern County Fire Department (KCFD). KCFD provides fire protection and emergency medical services to unincorporated areas of Kern County and to the cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco.

Law Enforcement

Kern County Sheriff's Office

The Kern County Sheriff's Office (Sheriff's Office) provides law enforcement services in unincorporated Kern County, including the Kern Fan Element lands. The Sheriff's Office, which enforces local, state, and federal laws, is responsible for crime prevention, ground and air patrol, crime investigation, the apprehension of offenders, regulation of noncriminal activity, and a number of related and support services. Headquarters for the Sheriff's Office is located at 1350 Norris Road in Bakersfield.

California Highway Patrol

The California Highway Patrol (CHP) provides traffic regulation enforcement, emergency management, and vice assistance on state highways, interstate highways, and other major roadways. The KFE property was traversed and bordered by highways and freeways maintained by CHP's Central Division, including Stockdale Highway, Taft Highway, Enos Lane, and Interstate 5 (I-5).

Solid Waste

No construction-related solid waste was generated in 1995 on the KFE property and the 1995 KWBA annual report does not indicate that any cleanup of illegal dump sites or disposal of other solid waste occurred.

7.14.2.2 Changes in the Physical Setting between 1996 – 2014

Fire Protection

As the largest fire district in Kern County, KCFD provides service to nearly 500,000 people in an approximately 8,000-square-mile area. In addition, KCFD maintains 14 mutual-aid agreements with neighboring fire suppression organizations.¹ KCFD has 46 fire stations throughout Kern County and is divided into seven battalions.² KCFD's Station 25 and Station 53 are the closest fire stations to KWB Lands. Station 25 is located approximately 9.5 miles northwest of KWB Lands at 100 Mirasol Avenue in the community of Buttonwillow. Station 53 is located approximately 6.5 miles east of KWB Lands at 9443 Taft Highway in the city of Bakersfield.

Law Enforcement

Kern County Sheriff's Office

The Kern County Sheriff's Office has 15 substations that are staffed by police, investigators, and supervisors, with each substation having access to all department support services.³ KWB Lands are located within the service areas of the Buttonwillow, Taft, Rosedale, and Lamont Substations.

The Buttonwillow Substation is located at 181 East First Street in Buttonwillow, approximately 10 miles northwest of KWB Lands. The Buttonwillow Substation provides law enforcement services to 1,500 square miles in northwestern Kern County, including the portion of KWB Lands north of Station Road, east of Morris Road, and west of I-5.⁴ The Buttonwillow Substation also houses the Sheriff's Office Rural Crime Investigation Unit (RCIU). The RCIU is a collaborative program designed to have experienced investigators work directly with stakeholders in the agricultural, livestock, and oil production industries.⁵

The Taft Substation is located at 215 North Lincoln Street in Taft, approximately 5 miles southwest of KWB Lands. The substation provides law enforcement services to a 787-square-mile area in

southwestern Kern County.⁶ The Taft Substation's service area includes the portion of KWB Lands south of Station Road, east of Morris Road, and west of I-5.

The Rosedale Substation is located at 10814 Rosedale Highway in Bakersfield, approximately 7 miles northeast of KWB Lands. The Rosedale Substation provides law enforcement services to the unincorporated communities bordering the northwest city limits of Bakersfield, including the portion of KWB Lands north of the Kern River and east of I-5.⁷

The Lamont Substation is located at 12022 Main Street in Lamont, approximately 15 miles southeast of KWB Lands. The Lamont Substation provides law enforcement services to an approximately 840-square-mile area, including the portion of KWB Lands south of the Kern River and east of I-5. The Lamont Substation's response area includes isolated agricultural areas, remote business locations, and Lamont. A large portion of the Lamont Substation's jurisdiction consists of farming and ranching communities that experience rural industrial thefts. As a result, patrol deputies work closely with the Sheriff's Office RCIU to prevent and deter agricultural, livestock, and oil field-related crimes.⁸

California Highway Patrol

The Central Division includes 15 area offices and six resident posts and maintains a mutual-aid agreement with the Sheriff's Office. The closest Central Division CHP office is located at 29449 Stockdale Highway in the community of Buttonwillow.⁹

Solid Waste

Solid waste collection services are provided to KWB Lands by American Refuse. American Refuse provides a 3-yard bin, and additional trash receptacles are located throughout KWB Lands. Refuse is collected weekly and materials such as steel, PVC pipe, and tires are recycled.

Illegal dumping occurs throughout KWB Lands and generally consists of construction and domestic waste, tires, furniture, appliances, and abandoned vehicles. When possible, KWBA staff members identify the source of the trash and contact the responsible party to remove the materials and clean the site. Kern County Environmental Health Services enforces county regulations on dumping; however, KWBA often loads, hauls, and cleans up dump sites.

Any nonrecyclable wastes collected from KWB Lands are transported to the Shafter-Wasco Sanitary Landfill. This landfill is located at 17621 Scofield Avenue in the community of Shafter, approximately 18 miles north of KWB Lands. According to the California Department of Resources Recycling and Recovery, the Shafter-Wasco Sanitary Landfill has a maximum permitted throughput of 1,500 tons per day (tpd), a total maximum permitted capacity of 21.9 million cubic yards, a remaining capacity of approximately 7.9 million cubic yards, and an anticipated closure date of December 21, 2053. The landfill is classified as a Class III municipal solid-waste landfill facility and is permitted to accept general residential, commercial, and industrial refuse for disposal, including municipal solid waste, construction and demolition debris, metals, green materials, agricultural debris, and other nonhazardous designated debris.¹⁰

7.14.3 IMPACTS AND MITIGATION MEASURES

With the exception of water supply and energy, the following discussion describes why the KWB activities would not have a direct significant impact on public services and utilities. The use of pumps for groundwater storage facilities could have an effect on water supply and energy use, see Sections 7.1, Hydrology, and 7.16, Energy, respectively.

7.14-1 KWB activities could potentially result in the need for new or expanded governmental facilities or an increase in demand for public services and utilities.

1996 – 2014

KWB activities included the construction of new facilities associated with the KWB. These activities have not directly resulted in population changes generating a need for new or expanded governmental facilities. Similarly, these activities have not directly increased water supply treatment and/or distribution facilities, wastewater collection and treatment facilities, or storm water runoff collection facilities.

KWB activities could have resulted in an increased demand for fire protection services, police protection services, and generated solid waste that exceeds landfill capacity.

Fire protection and emergency services are provided to KWB Lands by the KCFD. Station 25 and Station 53 are the closest fire stations to KWB Lands. Livestock grazing, mowing, and prescribed burning reduce fire hazards within and near KWB Lands by minimizing tumbleweeds, which create fire hazards when they pile up along fences near public highways, and by managing excessive plant growth. Prescribed burning occurred primarily on small patches of KWB Lands during winter and spring, when fuel moisture can prevent the active spread of the fire. KWBA personnel conducted and monitored small-scale burns and coordinated with KCFD during large-scale burns (see Section 7.0.4.1.4).

KWB activities did not introduce new land uses that that increased the demand for fire protection services and facilities. There were no fires on KWB Lands by KWBA that required KCFD fire or emergency services between 1996 and 2014. During this time, there have been incidents associated with power lines and other third-party facilities on KWB Lands that required fire protection services that are not due to KWBA activities.

One goal of the KWB Vegetation Management Plan required by the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) is to control trespass and vandalism that may damage conservation values (see Appendix 7-7c). KWBA contracts with a private security company that conducts daily patrols, monitors authorized access, checks gate locks, and controls traffic on KWB Lands. Security patrols protect the property from unauthorized access and/or unauthorized activities, including fishing, hunting, horseback riding, off-roading, illegal dumping, vandalism, and theft. KWB security removes poachers, target shooters, vagrants, and off-roaders from KWB Lands. Enforcement is provided by the Sheriff's Office Buttonwillow, Taft, Rosedale, and Lamont Substations; the Sheriff's Office RCIU; and the California Department of Fish and Wildlife (CDFW) wardens.

Private security at KWB Lands has minimized the need for police response. Relatively few calls for service to the Sheriff's Office as a result of theft on the property occurred each year. In addition, KWB activities did not introduce new land uses that increased demand for police protection services.

KWB activities did not increase demand for police protection services such that the construction of new or expansion of existing police protection services and facilities were required to maintain acceptable service ratios and response times.

KWB activities did not include any demolition or other similar activities that would generate solid waste. Excavated soils resulting from construction activities were redistributed on KWB Lands to construct other KWB facilities. Excess soil and other organic waste (i.e., cleared vegetation, trees, roots, and grass) were disposed of on-site or removed from the site and hauled to a suitable disposal area.

Solid waste generated during KWB operation was incidental and was collected in a 3-yard bin and in trash receptacles throughout KWB Lands. Illegal dumping occurred throughout KWB Lands, and waste generally consisted of construction and domestic waste, tires, furniture, appliances, and abandoned vehicles. KWBA often loads, hauls, and cleans up dump sites. Materials such as steel, PVC pipe, and tires are recycled. Any nonrecyclable wastes collected from KWB Lands are transported to the Shafter-Wasco Sanitary Landfill. The landfill is permitted to accept a maximum of 1,500 tpd of solid waste. With a permitted capacity of more than 21.9 million cubic yards, a remaining capacity of nearly 7.9 million cubic yards, and an expected closure date of 2053, Shafter-Wasco Sanitary Landfill has sufficient permitted capacity to accommodate the KWB's disposal needs.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to public services was ***less than significant***.

In addition, KWB activities from 1996 to 2014 have resulted in benefits to public services resources on KWB Lands as private security at KWB Lands has minimized the need for police response.

Mitigation Measures

None required.

2015 – 2030

Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as a result of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place.

These activities would not directly result in changes in population generating a need for new or expanded governmental facilities or an increase in demand for public services and utilities. Similarly, these activities would not directly increase water supply treatment and/or distribution facilities, wastewater collection and treatment facilities, storm water runoff collection facilities, and/or solid waste collection and disposal.

KWB activities could potentially have a direct impact by increasing the demand for fire protection services, police protection services, and generated solid waste that exceeds landfill capacity.

Fire protection and emergency services are provided to KWB Lands by KCFD. In the event of a fire during KWB activities, KCFD's Station 25 and Station 53 are the closest fire stations to KWB Lands and would provide first response.

Livestock grazing, mowing, and prescribed burning would continue to be implemented on KWB Lands to reduce fire hazards within and near KWB Lands by minimizing tumbleweeds, which create fire hazards when they pile up along fences near public highways, and by managing excessive plant growth. Prescribed burning would continue to occur primarily on small patches of KWB Lands during winter and spring, when fuel moisture is likely to prevent active spread of the fire. KWBA personnel would continue to conduct and monitor small-scale burns and would coordinate with KCFD during large-scale burns (see Section 7.0.4.1.4). KWB activities would not introduce new land uses that would increase demand for fire protection services and facilities. Therefore, KWB activities would not increase

demand for KCFD fire protection services such that the construction of new or expansion of existing fire protection services and facilities would be required to maintain acceptable service ratios and response times.

One goal of the KWB HCP/NCCP Vegetation Management Plan is to control trespass and vandalism that may damage conservation values (see Appendix 7-7c). KWBA would continue to contract with a private security company that conducts daily patrols, monitors authorized access, checks gate locks, and controls traffic on KWB Lands. Security patrols would continue to protect the property from unauthorized access and/or unauthorized activities, including fishing, hunting, horseback riding, off-roading, illegal dumping, vandalism, and theft. KWB security would continue to remove poachers, target shooters, vagrants, and off-roaders from KWB Lands. If necessary, enforcement of the security would continue to be provided by the Sheriff's Office Buttonwillow, Taft, Rosedale, and Lamont Substations; the Sheriff's Office RCIU; and the CDFW wardens.

Private security on KWB Lands minimizes the need for police response. It is anticipated that relatively few calls for service to the Sheriff's Office would occur each year. In addition, KWB activities would not introduce new land uses that increase demand for police protection services.

Therefore, KWB activities would not increase demand for police protection services such that the construction of new or expansion of existing police protection services and facilities would be required to maintain acceptable service ratios and response times.

KWB activities would not include any demolition or other similar activities that would generate solid waste. Excavated soils resulting from construction of future KWB facilities, such as recharge ponds and recovery wells, would be redistributed on KWB Lands. Excess soil and other organic waste (i.e., cleared vegetation, trees, roots, and grass) would be disposed of on-site or removed from the site and hauled to a suitable disposal area.

Solid waste generated during KWB operation would be incidental and collected in a 3-yard bin and in additional trash receptacles located throughout KWB Lands. However, illegal dumping has occurred throughout KWB Lands in the past and would likely continue to occur in the future. Wastes would consist of construction and domestic waste, tires, furniture, appliances, and abandoned vehicles. KWBA would load, haul, and clean up the dump sites as it has in the past.

Any nonrecyclable wastes collected from KWB Lands would be transported to the Shafter-Wasco Sanitary Landfill. The landfill is permitted to accept a maximum of 1,500 tpd of solid waste. With a permitted capacity of more than 21.9 million cubic yards, a remaining capacity of nearly 7.9 million cubic yards, and an expected closure date of 2053, Shafter-Wasco Sanitary Landfill has sufficient permitted capacity to accommodate the KWB activity disposal needs. Therefore, KWB activities would not generate waste materials that exceed permitted capacity of the Shafter-Wasco Sanitary Landfill.

Waste materials would not be generated or generated in small quantities when KWB recovered water would be used beyond KWB Lands. No new water conveyance facilities outside of KWB Lands to convey KWB-recovered water would be constructed for this purpose; KWB participants already have facilities in place to convey and exchange recovered water.

Therefore, the impact of KWB activities from 2015 to 2030 to public services would be ***less than significant***.

In addition, KWB activities from 2015 to 2030 are likely to result in benefits to public services resources on KWB Lands as private security at KWB Lands has minimized the need for police response.

Mitigation Measures

None required.

ENDNOTES

1. Kern County Fire Department. 2015. KCFD Facts. Available: <http://www.kerncountyfire.org/about-us.html>. Accessed November 25, 2015.
2. Kern County Fire Department. 2015. KCFD Facts. Available: <http://www.kerncountyfire.org/about-us.html>. Accessed November 25, 2015.
3. Kern County Sheriff's Office. 2015. Substations. Available: <http://www.kernsheriff.com/FieldOps/Substations/Pages/default.aspx>. Accessed November 25, 2015.
4. Kern County Sheriff's Office. 2015. Buttonwillow Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Buttonwillow/Pages/default.aspx>. Accessed November 25, 2015.
5. Kern County Sheriff's Office. 2015. Rural Crime. Available: <http://www.kernsheriff.com/Investigations/Detective/RuralCrime/Pages/default.aspx>. Accessed November 25, 2015.
6. Kern County Sheriff's Office. 2015. Taft Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Taft/Pages/default.aspx>. Accessed November 25, 2015.
7. Kern County Sheriff's Office. 2015. Rosedale Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Rosedale/Pages/default.aspx>. Accessed November 25, 2015.
8. Kern County Sherriff's Office. 2015. Lamont Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Lamont/Pages/default.aspx>. Accessed November 25, 2015.
9. California Highway Patrol. 2015. Central Division. Available: <https://www.chp.ca.gov/Find-an-Office/Central-Division>. Accessed November 25, 2015.
10. California Department of Resources Recycling and Recovery. 2015. Facility/Site Summary Details: Shafter-Wasco Recycling & Sanitary LF (15-AA-0057). Available: <http://www.calrecycle.ca.gov/SWFacilities/Directory/15-AA-0057/Detail/>. Accessed November 25, 2015.

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7.15 TRAFFIC AND TRANSPORTATION (REVISED)

7.15 TRAFFIC AND TRANSPORTATION (REVISED)

7.15.1 INTRODUCTION

7.15.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- Transfer of property known as the “Kern Fan Element property” in Kern County;*
- Water supply management practices; and*
- Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.15 identified potential impacts to traffic and transportation as a result of the transfer of the Kern Fan Element. Text from DEIR Section 7.15 that discusses KWB activities is copied below and shows revisions to this section. All other text in DEIR Section 7.15 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.15-1A identifies the potentially affected environmental resources from impacts of KWB activities on traffic and transportation.

TABLE 7.15-1A		
IMPACTS OF KWB ACTIVITIES PROPOSED PROJECT ELEMENTS ON TRAFFIC AND TRANSPORTATION		
Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and <u>KWB activities</u>	Changes in traffic patterns associated with construction and operation of groundwater storage facilities in Kern Fan Element	7.15-3

During public review of the ~~NOP~~ Notice of Preparation for the Monterey Plus EIR, interested parties submitted no comments on transportation resources.

7.15.1.2 Analytical Method

The assessment of impacts to transportation resources was conducted in accordance with standard professional practices. Factors considered in the analysis include:

- Substantial changes in traffic and circulation patterns as a result of KWB activities.

This analysis included a review of the environmental setting, impacts, and mitigation measures related to traffic and transportation, to the extent they apply, presented in the 1997 Monterey Initial Study and Addendum (see Appendix 7-6a).

7.15.1.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For the purposes of this REIR, impacts to traffic and circulation patterns would be considered potentially significant if the KWB activities ~~proposed project~~ would:

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system; or
- substantially exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

7.15.2 ENVIRONMENTAL SETTING

7.15.2.1 Physical Setting in 1995

Prior to the Department’s purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation (see Revised Appendix E). The remaining property contained 1,515 acres of isolated sensitive native plant communities and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities A Memorandum of Understanding was signed between the Department and Kern County Water Agency on March 25, 1987, that provided for the phase out of all agricultural production on the KFE property by the end of 1993. In fact, one of the tenants’ leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter all agricultural lands owned by the Department were fallowed and introduced annual grasses and forbs colonized the KFE property. The Kern Fan Element was transferred from DWR consists of approximately 19,900 acres of land located in Kern County southwest of Bakersfield. The Kern Fan Element was farmed for many years until the mid-1980s. After the California Department of Water Resources (Department) purchased the land in 1986, the agricultural fields were gradually taken out of production. By 1994, agriculture had ceased on the property and introduced annual

~~grasses and forbs had colonized the land.~~ The area is traversed by I-5, SRs 99, 119, 166, and 223 and paved and unpaved rural roads.

7.15.2.2 Changes in Physical Setting between 1996 – 201403

~~The KWB facilities currently include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. Numerous small, unpaved roads have been constructed to provide access along the KWB Canal and to other KWB facilities. Between 1996 and 201403, and as a result of the proposed project, some minor access roads associated with groundwater storage facilities were built in Kern County.~~

7.15.2.3 Regulatory Setting in 1995

Various federal, state and local agencies are responsible for transportation in the areas affected by the KWB activities~~proposed project~~. The most relevant agencies and laws and regulations are described below.

Federal

Federal Highway Administration

The Federal Highway Administration coordinates highway transportation programs in cooperation with states and other partners to enhance the country's safety, economic vitality, quality of life, and the environment. Major program areas include the Federal-Aid Highway Program, which provides federal financial assistance to states for construction and improvement of the National Highway System, urban and rural roads, and bridges. This program provides funds for general improvements and development of safe highways and roads.

State

California Department of Transportation

The California Department of Transportation (Caltrans) and its predecessors are responsible for planning, designing, building, operating and maintaining California's 15,000-mile State Highway System.

California Transportation Commission

The California Transportation Commission (CTC) is responsible for programming and allocating funds for the construction of highway, passenger rail and transit improvements throughout California. The Commission also advises and assists the Secretary of Business, Transportation, and Housing Agency and the Legislature in formulating and evaluating State policies and plans for California's transportation programs. The Commission is also an active participant in the initiation and development of State and federal legislation that seeks to secure financial stability for the State's transportation needs.

State Transportation Improvement Program

The State TIP is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the State Highway Account and other funding sources. The fund estimate serves to identify the amount of new funds available for the programming of transportation projects. Once the fund estimate is adopted, Caltrans and the regional planning agencies prepare TIPs for submittal by December 15th. Caltrans prepares the Interregional

Transportation Improvement Plan and regional agencies prepare Regional Transportation Improvement Plans. Public hearings are held in January (even years) in both northern and southern California. The State TIP is adopted by the CTC by April (even years).

State Highway Operations and Protection Program

The State Highway Operations and Protection Program (SHOPP) is a funding program for Caltrans-initiated projects that meet certain guidelines in accordance with Government Code Section 14526.5, Streets and Highways Code Section 164.6. These projects must be approved by the CTC, a separate governmental body from Caltrans. SHOPP is a four-year program of projects that address traffic safety, roadway rehabilitation, roadside rehabilitation, and operations related to the State Highway System.

Local

Kern Council of Governments

Kern Council of Governments (KCOG) is an association of city and county governments created to address regional transportation issues while protecting the integrity and autonomy of each jurisdiction. Its member agencies include the County of Kern and the eleven incorporated cities within Kern County, including Arvin, Bakersfield, California City, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco.

The Kern County 2000 Regional Transportation Plan is comprised of the Action Element, which establishes a plan for addressing identified needs and issues in accordance with the goals, objectives, and policies of the Regional Transit Plan, Intelligent Transportation Systems, Congestion Management Program, Air Quality Conformity, and a Financial Element. In addition, Kern County utilizes Transportation System Management (TSM) in its transportation planning, a system-wide approach to maximize use of existing facilities and available resources. KCOG, in cooperation with the City of Bakersfield, Kern County, and Caltrans, has developed TSM strategies to reduce traffic congestion.

General Plans

General Plans of the various counties and cities of the State of California contain a mandatory transportation and circulation element that includes policies to facilitate the respective Counties' Congestion Management Plans as well as local and regional transportation planning. All individual projects under the ~~KWB activities proposed project~~ would be expected to comply with the policies of the transportation element of the applicable General Plan.

7.15.2.4 Changes in Regulatory Setting between 1996 – 2014⁰³

Local

Kern County Regional Transportation Plan

The 2014 Regional Transportation Plan (RTP) prepared by KCOG was adopted on June 24, 2014. The 2014 RTP is a 26-year blueprint that establishes a set of regional transportation goals, policies, and actions intended to guide development of the planned multimodal transportation systems in Kern County. The RTP includes a Congestion Management Program designed to ensure that a balanced transportation system is developed, relating population and traffic growth, land use decisions, performance standards, and air quality improvements.¹

Kern County General Plan

The Circulation Element of the General Plan adopted in 2004 contains goals and policies related to traffic and transportation. The goals include protecting road right-of-way, protecting corridors for future transportation facilities, reserving right-of-way to meet future road needs that result from development, and providing ample flexibility in the Highway Plan to allow for growth beyond the 20-year planning horizon.²

The policies provide that the development of roads shall be in accordance with the Circulation Diagram Map, the timing and scope of required facilities should be set up and implemented through the Kern County Land Division Ordinance, mitigation is required if development causes affected roadways to fall below Level Of Service D, and developers shall build roads needed to access the existing road network

Bakersfield General Plan

The Circulation Element of the General Plan adopted in 2002 contains goals to provide a safe and efficient street system that links all parts of the area for movement of people and goods; provide for safe and efficient motorized, non-motorized, and pedestrian traffic movement; and minimize the impact of truck traffic on circulation, and on noise sensitive land uses.

Circulation Element policies include designing and locating driveways to minimize traffic disruption, require truck access to commercial and industrial properties be designed to minimize impacts on adjacent residential parcels, design transportation improvements to minimize noise impacts on adjacent uses, prevent streets and intersections from degrading below Level of Service "C" where possible, and require new development and expansion of existing development to pay or participate in its pro rata share of the costs of expansions.³

7.15.3 IMPACTS AND MITIGATION MEASURES

7.15-3 Traffic and circulation on or near KWB Lands in the Kern Fan Element could potentially be affected by KWB activities. ~~construction and operation of percolation ponds.~~

1996 — 201403

~~In 1995, the Kern Water Bank Authority (KWBA) constructed 3,034 acres of recharge ponds. From 1998 through 2003, an additional 4,080 acres were converted to shallow percolation ponds, for a total of 7,114 acres in 2003 in the Kern Fan Element. KWBA also constructed the Kern Water Bank Canal, a six-mile long earthen canal extending from the Kern River to the California Aqueduct.⁴ The KWBA facilities include approximately 7,200 acres of recharge ponds, 85 recovery wells, an extensive network of monitoring wells, 36 miles of pipeline, and the 6-mile-long KWB Canal. Unpaved roads were constructed to provide access to the new facilities. Traffic volumes on some rural roads temporarily increased during the construction period. In addition, routine maintenance of the new facilities resulted in a permanent increase in vehicular traffic on rural roads. Prior to 1995, the land now occupied by the ponds lay fallow and generated little or no traffic. The small increases in vehicular movements attributable to KWB construction and operation of the proposed project had little adverse effect on traffic flow on the affected rural roads. ~~Consequently, the proposed project is considered to have a less than significant impact.~~~~

Therefore, the impact of KWB activities from 1996 to 2014 with regard to traffic and circulation was **less than significant.**

Mitigation Measures

None required.

Future Impacts 2015 — 2030

~~A Habitat Conservation Plan (HCP) was developed for the KWB. The HCP allows developed uses on about 4,000 acres of KWB Lands (see Appendix 7-7a). Developed uses included permanent KWB facilities, farming, and commerce. Approximately 490 acres of land adjacent to Interstate 5 is designated for possible commercial use. Between 1995 and 2014, no development occurred on the 490-acre parcel. Since 2003, the Settlement Agreement prohibits development of this parcel. The Habitat Conservation Plan for the KWB allows developed uses; and approximately 490 acres are designated for possible commercial use. Between 1995 and 2003, no development occurred on the 490-acre parcel. The Settlement Agreement prohibits development of this parcel, and so under the proposed project the parcel would remain undeveloped.~~

~~Under the proposed project, it is expected that the KWBA would construct an additional 1,200 acres of percolation ponds in the Kern Fan Element. Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as a result of full build-out. In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but will be consistent with KWB HCP/Natural Community Conservation Plan (NCCP) requirements; final locations and areas will be determined as these facilities are designed.~~

The impacts of future conversion of lands for use as recharge ponds~~percolation basins~~ would affect traffic and circulation in the same way as past land conversion for the same purpose, as discussed above. The small increases in vehicular movements attributable to construction and operation of the recharge ponds and other KWB facilities would have a small temporary average daily traffic increase ~~little effect on traffic flow on the affected rural roads. The proposed project would have a **less-than-significant impact.**~~

Therefore, the impact of KWB activities from 2015 to 2030 with regard to traffic and circulation would be **less than significant.**

Mitigation Measures

None required.

ENDNOTES

1. Kern Council of Governments. 2014 (June 19). *2014 Regional Transportation Plan/Sustainable Communities Strategy*. Available: http://www.kerncog.org/images/docs/rtp/2014_RTP.pdf. Accessed May 7, 2015. Pages 2-2 through 2-11.
2. Kern County Planning Department. 2009 (September 22). *Kern County General Plan, Circulation Element*. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009. Available: <http://www.co.kern.ca.us/planning/pdfs/kcgp/KCGPChp2Circulation.pdf>. Accessed May 6, 2015. Pages 91–95.
3. Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*, Circulation Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Available: <http://www.bakersfieldcity.us/weblink7/Browse.aspx?startid=602140&dbid=0>. Accessed May 6, 2015. Pages III-10 through III-19.
4. ~~Jonathon Parker, Kern Water Bank Authority, personal communication with John Davis, EIP team, October 2003.~~

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7.16 ENERGY (NEW)

7.16.1 INTRODUCTION

7.16.1.1 Content

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Section 7.16 identified potential impacts to energy as a result of the transfer of the Kern Fan Element. Substantial new information is presented in this section, however, such that the text entirely replaces and updates text from DEIR Section 7.16 that discusses KWB activities. All other text in DEIR Section 7.16 remains unchanged. In addition to the impacts discussed below, to the extent they apply, indirect impacts as a result of population growth are presented in Chapter 8, Growth-Inducing Impacts, and indirect impacts from potential cropping changes are presented in Section 10.1, Cumulative Environmental Impacts.

Table 7.16-1 identifies the potentially affected environmental resources from impacts of KWB activities on energy.

TABLE 7.16-1**IMPACTS OF KWB ACTIVITIES RELATIVE TO ENERGY**

Proposed Project Element	Potentially Affected Environmental Resources	Impact Number
Transfer of Kern Fan Element lands, and KWB activities	Substantial wasteful, inefficient, and unnecessary energy consumption, increased demand for energy; construction of new electrical or natural gas facilities	7.16-1; 7.16-2

7.16.1.2 Analytical Method

Energy-related impacts associated with KWB activities were addressed qualitatively as part of this analysis. The analysis below uses guidance from the California Environmental Quality Act (CEQA) Guidelines Appendix F, and water sector-related emission reduction measures from the Assembly Bill (AB) 32 Scoping Plan (Scoping Plan) pertaining to energy use, to evaluate both past (1996-2014) and future (2015-2030) construction and operations and maintenance (O&M) energy impacts. When available, project-specific energy consumption data were used to evaluate energy impacts from KWB activities.

7.16.1.3 Standards of Significance

The significance criteria listed below are based on Appendix F and Appendix G of the State CEQA Guidelines. KWB activities would have a significant impact on energy and energy facilities if they would:

- require or result in the construction of new electrical power generation facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- develop land uses and patterns that cause substantial wasteful, inefficient, and unnecessary consumption of energy.

Appendix F also states that the goal of conserving energy should be met through decreasing overall per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance and use of renewable energy sources. Projects that are consistent with these strategies would be considered to meet the statewide goal of conserving energy.

In addition to the Appendix F guidance, this analysis also evaluates how the KWB complies with the water sector-related emission reduction measures established in the Scoping Plan. Similar to the analysis in Chapter 12, Climate Change, compliance with the Scoping Plan's applicable water/energy-related emission reduction measures would demonstrate that KWB is not operating in a fashion that would cause substantial wasteful, inefficient, and unnecessary consumption of energy. As determined in Chapter 12, Climate Change, the Scoping Plan's Measure W-3 would be applicable to KWB and is used to evaluate KWB's potential energy impacts.

7.16.2 ENVIRONMENTAL SETTING**7.16.2.1 Energy Sources**

The electrical system in Kern County is supplied by three of California's largest utilities: Pacific Gas & Electric Company (PG&E), Southern California Edison, and Southern California Gas. Electrical generation technologies present in Kern County include: cogeneration, wind energy, geothermal energy, biomass/transformation, solar energy, and hydroelectric.¹ Kern County consumed approximately 13,189 million kilowatt hours (kWh) of electricity in 2014.²

7.16.2.2 Regulatory Setting

Federal

There are no current federal policies, plans, laws, or regulations related to energy that are pertinent to KWB activities. United States Department of Energy pump efficiency regulations (10 CFR Part 429 and 431) will become effective in the marketplace in 2020.

State

Senate Bills 1078, 107, and 350, and Executive Orders S-14-08, S-21-09

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In February 2014, the California Public Utilities Commission reported that California's three largest investor-owned utilities (PG&E, Southern California Edison, and San Diego Gas and Electric Company) collectively provided 22.7 percent of their 2013 retail electricity sales using renewable sources and are continuing progress toward future 2020 requirements.³

Executive Order S-14-08 expanded the State's Renewable Portfolio Standard (RPS) to 33 percent renewable power by 2020. Executive Order S-21-09 directs the California Air Resources Board under its AB 32 authority to enact regulations to help the State meet its RPS goal of 33 percent renewable energy by 2020.

The 33 percent-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new RPS applies to all electricity retailers in California, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Consequently, PG&E, which would be the electricity provider for KWB activities, must meet the 33 percent goal by 2020. This requirement applies to any electricity used for KWB construction and/or operational activities. Further, SB 350 (chapter 547, Statutes 2015) adopted in 2015 increases the RPS to 50% by 2030.

Assembly Bill 32 Scoping Plan: Water/Energy-Related Measures

The original AB 32 Scoping Plan included emission reduction measures specifically focused on the water sector. The reduction measures, as listed and discussed in more detail in Chapter 12, Climate Change, focus on water management (i.e., usage efficiency, recycling, and urban runoff), water pricing, and water-related energy (i.e., system energy efficiency and renewable energy). Measure W-3 (Water System Energy Efficiency) includes energy-related actions that apply to KWB and this analysis. Compliance with this measure demonstrates that KWB is consistent with the energy- and greenhouse gas emissions-related goals of the state.

7.16.3 IMPACTS AND MITIGATION MEASURES

7.16-1 KWB activities would potentially require or result in the construction of new electrical or natural gas facilities.

The KWB is provided with electricity and natural gas by PG&E. No new electrical or natural gas facilities have been needed to serve KWB activities in the past, including construction activities that were more extensive than activities planned in the future, with the exception of minor facilities to provide electricity to KWB facilities. It is not anticipated that any future KWB activities, including

proposed temporary construction activities, would require any new electrical or natural gas facilities to provide energy.

1996 — 2014

The KWB's 1996 to 2014 O&M activities required electricity for the operation of water pumps and other related water conveyance infrastructure. PG&E provided electricity to all the KWB O&M components. The KWB's annual electrical demand would be approximately 55.2 million kWh, based on current estimates. It is conservatively assumed that these electricity consumption levels would be representative of past energy consumption as well. Electrical demand was higher during recovery and lower during recharge. It is anticipated that from 1996 to 2014, the KWB activities O&M energy needs would have required some minor incremental increase in PG&E's electricity service infrastructure. However, the KWB's O&M (and construction) activities did not result in the construction of new electrical or natural gas facilities.

Therefore, the impact of KWB activities from 1996 to 2014 with regard to the need to construct new electrical or natural gas facilities was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

The KWB's 2015 to 2030 O&M activities would require additional electricity beyond the 1996 to 2014 demands to operate additional recharge ponds and recover and convey the recharged water. The KWB's annual electrical demand would be approximately 55.2 million kWh, based on current estimates. Electrical demand would be higher during recovery and lower during recharge. The proposed KWBA construction projects would incrementally increase electricity demand beyond current levels; however, it is not anticipated that the planned construction projects would require PG&E to construct new electricity facilities that could cause additional environmental impacts.

Therefore, the impact of KWB activities from 2015 to 2030 with regard to the need to construct new electrical or natural gas facilities would be ***less than significant***.

Mitigation Measures

None required.

7.16-2 KWB activities could potentially develop land uses and patterns that cause substantial wasteful, inefficient, and unnecessary consumption of energy that would result in an increased demand for energy.

1996 — 2014

Construction-Related and On-road Vehicles Energy Consumption

The 1996 to 2014 construction activities on KWB Lands increased energy consumption for the duration of construction activities in the form of electricity, natural gas, and petroleum products. The primary energy demands during construction were associated with construction equipment and vehicle fueling. Energy, in the form of fuel, would have been consumed during construction by work vehicles and off-road equipment operating on-site, trucks delivering equipment and supplies to the site, and construction workers driving to and from the site. During those construction activities, both on- and off-road

construction-related vehicles would have been required to comply with any applicable federal and state standards at that time. Construction activities occurring from 1996 to 2014 included constructing typical KWB infrastructure and supporting O&M activities, and therefore did not involve any especially energy intensive activities.

Operations and Maintenance Electrical Energy Consumption

O&M activities included electricity consumption for water management – primarily water recovery pumping during dry periods. Annual average electricity consumption associated with operation of the KWB activities is conservatively assumed to have been 55.2 million kWh, which is based on the average electricity consumption from 2010 to 2014. Annual average electricity consumption for O&M activities in previous years would have been less than or equal to this value. PG&E provided electricity to all the KWB O&M components. The amount of power required was within the limits of the planned power supply since no new facilities were built to fulfill energy needs from KWB activities. The other option for energy for water management activities is diesel energy which is less energy efficient and would require on-going transport of diesel fuel rather than using established electric power lines. In addition, diesel-fueled infrastructure would result in other resource impacts to air quality and greenhouse gas emissions.

As the utility provider in the area, PG&E has been increasing the amount of renewable resources in its electricity production portfolio over this period of time. These actions are a result of market conditions (e.g., maturing renewables technology and increasing fossil fuel prices) and regulatory requirements. PG&E's achievement of the 2020 and 2030 RPS requirements (i.e., 33% renewable by 2020 and 50% renewable by 2030) would increase its (and indirectly KWBA's) reliance on renewable resources and decrease future reliance on fossil fuels.

Furthermore, during this time period, PG&E was implementing its Advanced Pump Efficiency Program (APEP), which has resulted in the rehabilitation, retrofit, and replacement of a number of KWB pumps (see Chapter 12, Climate Change, for additional information on APEP energy savings). The APEP provides funding for these types of energy efficiency actions, which reduces energy demand from PG&E's customers (e.g., KWB).

In addition to PG&E's APEP, during this time, KWBA was implementing its standard pump stations and water-well maintenance program, which includes pump repair every three to five pumping seasons, or as determined through pump and energy monitoring. This maintenance and monitoring program ensured that pumps were operating at average industry standards to achieve efficiency of KWB operations and costs. The servicing of pumps under this program minimized electricity consumption (and subsequent GHG emissions) needed for operations. (See Chapter 12, Climate Change, for additional information on KWBA's pump efficiency program.)

Conclusion

Construction activities occurring from 1996 to 2014 included constructing typical KWB infrastructure and, therefore, did not involve any especially energy intensive activities. Through the APEP and its own maintenance actions, KWBA has increased its pump energy efficiency and thus decreased the energy intensity of water provided to KWB participants.

Therefore, KWBA's construction and O&M activities from 1996 to 2014 with regard to energy consumption was ***less than significant***.

Mitigation Measures

None required.

2015 — 2030

Construction-Related Energy Consumption

Future KWB construction activities, including recharge pond and well construction, would increase energy consumption similar to the previous (1996 to 2014) construction activities, which were similar activities to those proposed now by KWBA. However, future construction activities would result in reduced energy consumption rates for construction equipment and vehicles because of improved fuel efficiency technologies and turnover in KWBA's vehicle and equipment fleet. In addition, planned construction activities do not have any unusual project characteristics that would necessitate the use of less energy-efficient construction equipment or vehicles that would be less energy-efficient than the equipment and vehicles used at the time at comparable construction sites elsewhere in the region. Rather, it is anticipated that over time, construction-related on- and off-road vehicles would become more energy efficient as new emissions technology become available, new emissions standards are promulgated, and overall turnover occurs in the vehicle fleet. Therefore, it is expected that construction fuel consumption associated with future KWB construction activities would be more efficient than in the past and not any more inefficient, wasteful, or unnecessary than fuel consumption at other construction sites in the region.

Operational and Maintenance Energy Consumption

KWB activities requiring electricity would continue to be supplied by PG&E, which as described above would continue to increase its renewable energy portfolio to meet its RPS requirements in 2020 and 2030. As of April 2016, PG&E is still administering its APEP to provide financial incentives for entities such as KWBA to continue increasing the energy efficiency of its pump systems. Furthermore, KWBA's existing monitoring program, if continued and strengthened, would ensure that the pump system's energy efficiency is regularly monitored and those data are used to make decisions on rehabilitations, retrofits, and/or replacements, regardless of PG&E's APEP. Thus, future KWB O&M activities would continue to manage and improve the pump system energy efficiency.

Conclusion

Construction activities occurring during 2015-2030 would include constructing typical KWB infrastructure and therefore would not involve any especially energy intensive activities. It is expected that construction fuel consumption associated with future KWB construction activities would be more efficient than in the past and not any more inefficient, wasteful, or unnecessary than fuel consumption at other construction sites in the region. Therefore, KWBA construction activities from 2015 through 2030 with regard to energy consumption would be less than significant.

With respect to KWB O&M activities, KWB's activities would continue to use a similar amount of electrical energy as during 1996-2014. However, KWB's energy provider (PG&E) would continue increasing its renewable energy portfolio to meet its 2020 and 2030 RPS requirements and, as of April 2016, is continuing to administer the APEP, which assists in KWBA's pump rehabilitation, retrofit, and replacement actions. KWBA has historically and currently performs pump efficiency actions to monitor and maintain pumps at optimal working conditions; there is no formal mechanism to require these pump efficiency actions that minimize energy consumption. Therefore, consistency with Scoping Plan Measure W-3 (Water System Energy Efficiency)(see Chapter 12, Climate Change, Mitigation Measure 12-1) cannot be tracked as part of an official plan or program approved by the KWBA Board of Directors. Thus, for the purposes of a conservative analysis, it is assumed that without a formal pump

efficiency plan, KWBA might not be consistent with the applicable water-related Scoping Plan measures (i.e., Measure W-3), and KWB O&M activities from 2015 through 2030 could be **potentially significant**.

Mitigation Measures

Mitigation Measure 7.16-2 requires implementation of Mitigation Measure 12-1, which is a formal Pump System Energy Efficiency Plan (PSEEP) to ensure that O&M activities are consistent with the AB 32 Scoping Plan's Measure W-3. In addition, as new recharge ponds, water pumps, and conveyance infrastructures are installed in the future, procurements would be required to meet the most currently applicable pump efficiency standards as required in Mitigation Measure 12-1. Similarly, as older water pumps and conveyance infrastructures are replaced through passive turnover (not required in the PSEEP), O&M activities would increase in energy efficiency. Therefore, it is anticipated that the energy efficiency of future O&M activities would gradually increase with time independent of the PG&E APEP and Mitigation Measure 12-1.

Mitigation Measure 7.16-2 would reduce impacts of KWB activities with regard to energy resources to less than significant. Therefore, the impact of KWB activities from 2015 to 2030 with regard to energy consumption would be **less than significant, with mitigation**.

7.16-2 *KWBA will implement Mitigation Measure 12-1.*

ENDNOTES

1. Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). Stockdale Integrated Banking Project Draft Environmental Impact Report (SCH # 2013091076). Available: <http://www.rrbwsd.com/wp-content/uploads/2015/04/2015-04-Stockdale-DEIR-optimized.pdf>.
2. California Energy Commission Energy Consumption Data Management System, Electricity Consumption by County, 2014.
3. California Public Utilities Commission. 2014 (February). *Biennial RPS Program Update*. Available: http://www.cpuc.ca.gov/NR/rdonlyres/F39A3D4C-6EE9-48AA-A0C9-03D6A3B3EF38/0/Section_399_19_Report_FINAL.pdf. Accessed January 7, 2016.

8. GROWTH-INDUCING IMPACTS (NEW)

8. GROWTH-INDUCING IMPACTS (NEW)

8.1 INTRODUCTION

The proposed project analyzed in the Monterey Plus EIR was the Monterey Amendment and the Settlement Agreement. The Monterey Plus EIR considered five “elements” of the Monterey Amendment as follows:

- *Changes in the procedures for allocation of Table A water and surplus water among the SWP contractors;*
- *Approval to permanent transfers of 130,000 acre feet and retirement of 45,000 acre-feet of SWP long-term water supply contracts’ Table A amounts;*
- *Transfer of property known as the “Kern Fan Element property” in Kern County;*
- *Water supply management practices; and*
- *Restructured water rates.*

This REIR has changed the description of the Kern Fan Element property transfer to be:

- *Transfer of property known as the “Kern Fan Element property” in Kern County and its development and continued use and operation as a locally owned and operated groundwater banking and recovery project.*

There are no revisions to the other elements of the Monterey Amendment or of the Settlement Agreement, and no changes have been made relating to them in this REIR. (See discussion in Introduction/Executive Summary.)

This REIR does not supersede the analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR. The Monterey Plus EIR focused on the transfer of the KFE property, which was fully analyzed in the Monterey Plus EIR. This REIR did not identify any new impacts or changes to impacts caused by the transfer of the KFE property. Therefore, this REIR focuses on the development and continued use and operation of the KWB as a locally owned and operated groundwater banking and recovery project (“KWB activities”).

The Monterey Plus DEIR Chapter 8 identified potential growth-inducing impacts of the Monterey Amendment and the Settlement Agreement, but did not specifically discuss potential growth-inducing impacts of the KWB activities. Substantial new information is presented in this section regarding KWB activities. All other text in DEIR Chapter 8 remains unchanged.

8.1.1 CEQA Requirements

To comply with the California Environmental Quality Act (CEQA), an EIR must discuss the ways in which the proposed project could affect economic or population growth in the vicinity of the project and how the characteristics of the project could result in other activities with adverse impacts to the environment [CEQA Guidelines Section 15126.2(d)].

Specifically, CEQA Guidelines Section 15126.2(d) states that an EIR must:

“Discuss the ways in which the 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.”

Economic growth refers to the extent to which a proposed project could cause increased activity in the local or regional economy. Economic and population growth can be induced in a number of ways, including through the elimination of obstacles to growth, or through the stimulation of economic activity. Elimination of obstacles to growth refers to the extent to which a proposed project removes infrastructure limitations or removes regulatory constraints that could result in growth. For example, an increase in the capacity of utility or road infrastructure that is installed as part of the proposed project could allow either new or additional development in the surrounding areas. Increases in the population may tax existing community service facilities, requiring new facilities, the construction of which could cause potentially significant environmental impacts.

8.1.2 Analysis of Growth Impacts

8.1.2.1 Elimination of Obstacles to Growth

Increased average annual deliveries of KWB water to affected service areas could result in the greater reliability of water and potentially construction of additional local infrastructure to deliver the water supplies. This could remove an obstacle to growth.

8.1.2.2 Economic Effects

At the local level, increased population that could result from increased reliability with KWB water, could stimulate increased economic activity as a result of an increased demand for goods and services necessary to support the population growth. The need for additional goods and services would induce increased employment. An increase in future employees would require the development of physical space. It is the characteristics of this physical space and its specific location that would determine the type and magnitude of associated environmental impacts of this economic activity.

8.1.2.3 Environmental Impacts

Because there could be an increase in population in some areas, currently undeveloped land could be converted to urban uses or current urbanization could be intensified, which could have secondary (or indirect) environmental effects such as impacts on special-status species and their habitat, changes in storm water quality and quantity due to increased impervious surface cover, reduction in air quality, increased traffic and noise levels, reduction in public service and utility levels of service, etc.

The project-specific environmental impacts of implementing the KWB activities are evaluated in Chapter 7 of this REIR. This Chapter 8 of the REIR provides a generalized analysis of potential

secondary impacts of the KWB activities based on the known environmental effects of urban development in California.

8.2.4.1 Types of Environmental Impacts Related to Growth

In general, land that would be converted to urban uses along transportation routes and on the fringes of existing urban and suburban areas is typically undeveloped or used for agriculture. Conversion to urban uses of agricultural lands removes this land permanently from being available for agricultural production. In addition, conversion of agricultural or undeveloped lands eliminates most of the wildlife habitat value of these lands. Landform and drainage patterns could be altered, with natural drainage channels largely replaced by engineered storm water systems. Impermeable roofs, parking lots, and roadways could replace permeable surfaces with a consequent increase in storm water runoff and a decrease in groundwater recharge. Various substances associated with homes, yards, and vehicle use (paints, pesticides, plasticizers, oil and grease, brake dust, pet wastes, etc.) could be deposited on urban surfaces and conveyed to natural waterways. The introduction of people and vehicles into previously unpopulated or lightly populated areas could increase traffic, noise levels, air pollutant emissions, the generation of sanitary wastewater and solid waste, and the demand for local services.

The following discussion briefly summarizes the general types of environmental impacts that could occur as a result of growth-inducing activities:

- **Aesthetics**—Temporary and permanent degradation of visual character for developed land uses during construction and operation and creation of new light, glare, and skyglow.
- **Agricultural Resources**—Conversion of Important Farmland to nonagricultural urban uses; cancellation of Williamson Act contracts; conflicts with and disruption of existing agricultural operations; and conflicts among agricultural operations and new residential, commercial land uses, or other facilities, such as parks and schools.
- **Air Quality and Global Climate Change**—Temporary, short-term construction-generated emissions of criteria air pollutants, such as particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (i.e., PM₁₀), and emissions of ozone precursors (e.g., reactive organic gases [ROG] and oxides of nitrogen [NO_x]); long-term operational-generated emissions that exceed San Joaquin Valley Air Pollution Control District (SJVAPCD) thresholds for criteria air pollutants (PM₁₀, ROG, and NO_x), exposure of sensitive receptors to toxic air contaminants and odors; long-term emissions of criteria air pollutants or local mobile-source carbon monoxide; emissions of greenhouse gases; and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions.
- **Biological Resources**—Loss and degradation of habitat for special-status wildlife and plants; potential loss and degradation of jurisdictional wetlands and other waters of the United States or waters of the state; and impacts on fisheries resulting from changes in discharge to local waterways and the Kern River.
- **Cultural and Paleontological Resources**—Loss of or damage to known and as-yet-undiscovered cultural resources, paleontological resources, and human remains during construction.
- **Geology and Soils**—Temporary, short-term construction-related erosion; damage to structures and infrastructure from seismic activity; and construction on expansive/unstable soils and soils with high shrink-swell potential.
- **Hazards and Hazardous Materials**—Exposure of construction crews and the public to contaminated soil, groundwater, and hazardous materials used in construction or present in excavated soils or from the routine transport, use, and disposal of hazardous materials;

temporary road hazards caused by lane closures, increased truck traffic, and other roadway impacts during construction; and exposure to wildlife collision hazards.

- **Hydrology and Water Quality**—Increased stormwater discharges of suspended solids, increased turbidity, and potential mobilization of other pollutants from project construction sites; and hydrologic and water quality impacts from discharge to local waterways and the Kern River.
- **Land Use and Agricultural Resources**—Conflict with Kern County or the City of Bakersfield General Plan policies, land use designations, or zoning; physically divide an established community; or incompatible land uses with adjacent agricultural land uses.
- **Noise**—Temporary, short-term exposure of sensitive receptors to noise levels above noise ordinances during construction and long-term exposure of sensitive noise receptors to new stationary-source noise and increased vehicular-related traffic that exceed County noise standards.
- **Population and Housing**—Induce population growth in Kern County and the City of Bakersfield through construction of new homes and businesses or through the extension of roads or other infrastructure or displace people or existing housing that necessitates the construction of replacement housing elsewhere.
- **Public Services**—Increase demand for fire protection facilities and services, including the City of Bakersfield Fire Department, Kern County Fire Protection District, and Kern County Fire Department facilities and services; law enforcement facilities and services, including the City of Bakersfield Police Department, Kern County Sheriff's Department, California Highway Patrol facilities and services; schools; parks; or other public facilities, thus necessitating the construction of new or expansion of existing public facilities.
- **Recreation**— Increase the use of existing neighborhood and regional parks or other recreational facilities, such as the Kern River Parkway Trail, such that substantial physical deterioration of the facility would occur or be accelerated.
- **Traffic and Transportation**— Conflict with the City of Bakersfield or Kern County ordinances, policies, or programs establishing measures of effectiveness for the performance of the circulation system or those related to bicycle or pedestrian facilities; result in traffic hazards from incompatible urban land uses and adjacent agricultural land uses, such as those; or result in inadequate emergency access; and increase traffic near centers of regional development.
- **Utilities and Service Systems**—Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities; increase demand for water supplies, including water supplies provided by the City of Bakersfield, Improvement District No. 4 (ID4), and Tejon-Castac Water District (TCWD); require the construction of new stormwater drainage facilities; or generate solid waste beyond the capacity of existing landfills.

EIRs have been prepared on several projects that receive water from KWB participants. Summaries of the significant and unavoidable impacts identified for these projects are presented below. See Section 8.2 for an analysis of growth-inducing impacts that focuses on the two KWB participants that deliver water for municipal and industrial (M&I) uses: ID4 and TCWD.

The TCWD provides water supplies to the Tejon Industrial Complex area and residential, commercial, and recreational land uses identified in the proposed Tejon Mountain Village (TMV).¹ Environmental impacts for these projects are analyzed in the *Tejon Industrial Complex Final Environmental Impact Report*, *Final Environmental Impact Report Tejon Industrial Complex East Specific Plan*, *Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan*, and *Final Environmental Impact Report Tejon Mountain Village* by TMV, LLC.^{2,3,4,5} The environmental

impact analyses and cumulative impacts analyses from these documents are hereby incorporated by reference.

Because the KWB stores water supplies for the Tejon Industrial Complex area and TMV, KWB activities potentially contribute to the significant and unavoidable impacts identified for those projects. The significant and unavoidable environmental impacts identified in the Tejon Industrial Complex EIR, Tejon Industrial Complex East EIR and Supplemental Analysis EIR, and the TMV EIR are briefly summarized below.

Tejon Industrial Complex EIR

The Tejon Industrial Complex EIR (State Clearinghouse No. 99061016) was circulated for public review and adopted by Kern County in February 2000. The significant and unavoidable environmental impacts identified in the Tejon Industrial Complex EIR are summarized below:

- **Aesthetics**—Cumulatively considerable contributions to significant cumulative impacts related to visual changes from regional development.
- **Air Quality and Climate Change**—Emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds and cumulative contributions to significant cumulative impacts on regional emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds.
- **Public Services**—Cumulatively considerable contributions to significant cumulative impacts related to generation of solid waste that exceed landfill capacity.

Tejon Industrial Complex East Specific Plan EIR

The Tejon Industrial Complex East Specific Plan EIR (State Clearinghouse No. 2001101133) was circulated for public review and adopted by Kern County on January 21, 2003. The significant and unavoidable environmental impacts identified in the Tejon Industrial Complex East Specific Plan EIR are summarized below:

- **Agricultural Resources**—Conversion of over 1,000 acres of Farmland of Statewide Importance to nonagricultural urban uses.
- **Air Quality**—Long-term operational-generated emissions of PM₁₀ and emissions of ozone precursors (e.g., ROG and NO_x) that exceed SJVAPCD thresholds.
- **Noise**—Long-term exposure of rural residences along Wheeler Ridge Road to increased vehicular-related traffic.

Tejon Industrial Complex East Supplemental Analysis EIR

Subsequent to the certification of the Tejon Industrial Complex East Specific Plan EIR, various parties challenged the County's certification and project approval in an action in Kern County Superior Court (the Court), entitled *Center for Biological Diversity; Center on Race, Poverty, and the Environment; the Sierra Club; and Kern Audubon Society v. County of Kern* (2003). A Supplemental Analysis, in accordance with the Kern County trial court's direction, was prepared that provided new technical information on air quality and biological resources; evaluated the project for impacts to air quality and biological resources; identified mitigation measures and design features, as necessary, that would reduce the impacts to air quality and biological resources; and provided a determination of the level of significance of these impacts. The applicant also revised the Tejon Industrial Complex East Specific Plan based on supplemental analysis of air quality impacts.

The Supplemental Analysis EIR determined that significant and unavoidable impacts would occur from project-related emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds and from cumulatively considerable contributions to significant cumulative impacts on regional emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds. No significant and unavoidable impacts were identified for biological resources. The Kern County trial court discharged the writ of mandate, and the Court of Appeal affirmed.⁶

Tejon Mountain Village Specific Plan EIR

The TMV Specific Plan EIR (State Clearinghouse No. 2005101018) was circulated for public review and adopted by Kern County on October 5, 2005. This EIR was also challenged under CEQA and the Court of Appeal concluded that the EIR complied with CEQA.⁷ The significant and unavoidable environmental impacts identified in the TMV Specific Plan EIR are summarized below:

- Aesthetics/Light and Glare—Changes to views along Interstate 5 and the Lebec Road interchange and introduction of new sources of light and glare.
- Air Quality and Climate Change— Temporary, construction-related emissions of ROG and long-term operational-generated emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds; cumulative contributions to regional emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds; and cumulatively considerable contributions to significant cumulative impacts associated with greenhouse gas emissions that do not meet Assembly Bill 32 greenhouse gas reduction requirements.
- Biological Resources—Cumulatively considerable contributions to significant cumulative impacts on the California condor population levels and range.
- Hazards and Hazardous Materials—Exposure to construction workers and residents from encounters with wildlife.
- Noise—Long-term exposure of sensitive receptors to increased noise from vehicular-related traffic and cumulatively considerable contributions to significant cumulative impacts on traffic noise that already exceeds the County’s General Plan noise standards.
- Population and Housing—Significant project-related and cumulatively considerable contributions to significant cumulative impacts from increases in population and housing relative to existing conditions.
- Transportation and Traffic—Cumulatively considerable contributions to significant cumulative impacts from increases in traffic at intersections and freeway segments from regional development.

Tehachapi Uplands Multiple Species Habitat Conservation Plan and Environmental Impact Statement

The U.S. Fish and Wildlife Service prepared the Tehachapi Uplands Multiple Species Habitat Conservation Plan (Tehachapi HCP) and Environmental Impact Statement for issuance of an incidental take permit for approximately 141,886 acres (permit area) of the 270,360-acre Tejon Ranch. A total of 8,817 acres of the Tejon Ranch were designated for development associated with the previously discussed TMV Specific Plan EIR (see above) and associated projects covered under the TMV Specific Plan EIR. A total of 16 acres managed by the TCWD on California Department of Water Resources (Department) lands are also located within the 8,817 development footprint area. The Tehachapi HCP permanently protects 116,523 acres of the 141,886 permit area, including 23,001 acres of open space within the TMV Specific Plan area as mitigation for growth-related impacts of development projects on Tejon Ranch.⁸

8.2.4.2 Local Decision Making on Land Use Planning

It is unclear whether in certain areas increased reliability of water supply eliminates an obstacle to growth. Increased reliability of water supply would not improve infrastructure capacity or remove a regulatory constraint that had previously limited growth in the municipal contractor's service areas. However, it is possible that uncertainty in water supplies could, in and of itself, be considered an obstacle to growth because planners might have limited growth (urbanization) based on water supply availability.

Although a project may have growth-inducing potential, it may not result in growth. Neither the Department nor the Kern Water Bank Authority (KWBA) make decisions with regard to where and how growth should occur. Decisions regarding growth policy are made through the general planning process at regional and local levels. However, growth is ultimately controlled by decisions made with respect to individual development proposals at the local level by cities and counties. Availability of water is only one of many factors that land use planning agencies consider when making decisions about growth. Identifying water demands and available sources to meet those demands is now something that urban water suppliers must do in the Urban Water Management Plans (UWMPs) and water supply assessments required for projects above a certain size. See Monterey Plus DEIR Section 9.2, Reliability of Water Supply and Growth, Pertinent Laws, Regulations, and Planning Processes, for further information.

The cities and counties are responsible for considering the environmental effects of their decisions. When new developments are proposed, the cities and counties prepare environmental documents pursuant to CEQA. The impacts of growth would be analyzed in detail either in general plan EIRs or in project-level CEQA documents. Mitigation of identified impacts would be the responsibility of the local jurisdictions in which the growth would occur. Mitigation measures could include locating the growth in areas where sensitive resources are absent, minimizing the loss of resources, or replacing any loss. If identified impacts could not be mitigated to a level below the established thresholds, then the local jurisdiction would need to adopt overriding considerations.

8.2 POTENTIAL GROWTH-INDUCING IMPACTS OF THE KWB

8.2.1 Introduction

KWB activities do not involve construction of new housing and would not substantially expand or establish new employment opportunities that, in turn, would generate housing development. Nor would the KWB provide water supply infrastructure to a previously undeveloped or underserved region.

The following analysis of growth-inducing impacts focuses on the two KWB participants that deliver water for municipal and industrial (M&I) uses: ID4 and TCWD. This section describes the ID4 and TCWD service areas, reviews the population growth projections for ID4 and TCWD, and presents the existing and projected water demand and water supply conditions based on the ID4 2010 UWMP, the TCWD 2005 UWMP, and the TMV Water Supply Assessment (WSA).^{9,10,11} It evaluates the potential for KWB activities to have an indirect effect on growth by removing an obstacle to growth within the ID4 and TCWD service areas. It also describes KWB-recovered water by Irvine Ranch Water District for use in its service area.

8.2.2 Improvement District No. 4 Service Area

ID4 currently has agreements to provide wholesale treated water to the California Water Service Company, City of Bakersfield, and North of the River Municipal Water District, all of which provide treated water supplies to the City of Bakersfield, as well as East Niles Community Services District,

which provides treated water supplies to the unincorporated area of Kern County adjacent to the City of Bakersfield's eastern boundary.

ID4 does not make decisions with regard to new development that would require connections to potable water supplies nor does it have authority or responsibility for approving land use designations. The California Water Service Company, City of Bakersfield, North of the River Municipal Water District, and East Niles Community Services District provide their projected water demands to ID4 based on projects that are under evaluation, are in the planning process, or are the result of water planning efforts within each respective service area. Table 8-1 identifies the water demand projections provided by each wholesale water supplier between 2010 and 2035.

Wholesale Water Supplier	2010	2015	2025	2035
East Niles Community Services District	5,000	11,000	11,000	11,000
City of Bakersfield	0	6,500	6,500	6,500
California Water Service Company	11,500	19,500	20,500	20,500
North of the River Municipal Water District	8,500	11,000	12,500	15,000
Total	25,000	48,000	50,500	53,000

Notes:
afy = acre-feet per year
Source: Kennedy/Jenks Consultants 2011:2-5

8.2.4.1 Population Projections

The ID4 2010 UWMP provides population projections from 2015 to 2035 within its service area. ID4 based these population projections on the Kern Council of Governments' Transportation Advisory Zone population projection database. As shown in Table 8-2, the population in the ID4 service area is projected to increase from 362,447 in 2015 to 525,052 by 2035, or approximately 45 percent.

Year	Population
2015	362,447
2020	414,027
2025	466,989
2030	428,118
2035	525,052

Source: Kennedy/Jenks Consultants 2011:2-1

8.2.4.2 Water Supply and Demand

ID4's water supply consists of SWP water, banked groundwater in Kern Fan groundwater projects, water surplus to the CVP, and Kern River water. Water surplus to the CVP and Kern River water typically have no predictable pattern of yield and therefore are not considered to be part of the ID4 supplies for planning purposes. While ID4 receives supply benefits from these sources when they are available, ID4 does not make long-term planning decisions on the basis of these supplies continued availability.¹²

In the event of a short-term SWP water deficiency, ID4 can rely upon water previously banked in groundwater banking projects to augment surface supply from the SWP. ID4 participates in five groundwater banking projects: KWB, the City of Bakersfield 2800 Acre Recharge Facility, Pioneer Project, Allen Road Complex Well Field, and ID4/Rosedale Joint Use Recovery Project. Table 8-3 summarizes the recharge and recovery capacity of its currently operating groundwater banking programs. Supplies available to ID4 from previously banked water are projected to be 86,066 acre-feet per year (afy) in average water years.

TABLE 8-3

**IMPROVEMENT DISTRICT NO. 4 GROUNDWATER
RECHARGE AND RECOVERY SUMMARY (AFY)**

	City of Bakersfield 2800 Acre Recharge Facility¹	Kern Water Bank	Pioneer Project	Allen Road Complex Well Field	ID4/Rosedale Joint Use Recovery Project¹	Total
Total Recharge Capacity	--	450,000	146,000	--	--	596,000
Total Recovery Capacity	12,000	230,000	100,000	36,000	21,000	399,000
ID4 Percent Interest	100%	9.62%	10%	100%	22%	--
ID4 Recharge Capacity	--	43,290	14,600	--	--	57,890
ID Recovery Capacity	12,000	22,126	10,000	36,000	5,940	86,066

Notes:

afy = acre-feet per year; ID4 = Improvement District No. 4; Rosedale = Rosedale-Rio Bravo Water Storage District

1. In 2012 and 2025, the contracts for the City of Bakersfield 2800 Acre Recharge Facility and the ID4/Rosedale Joint Use Recovery Project are set to expire, respectively.

Source: Kennedy/Jenks Consultants 2011:3-15

As shown in Table 8-3, ID4 has a 9.62 percent interest in the recharge and recovery facilities of KWB as a result of the 1995 joint powers agreement between KWB participants and KWBA (see Revised Appendix E, Section V.B.2). As of 2010, based on its most recent UWMP, ID4 currently has approximately 140,000 af of previously banked groundwater stored in the KWB available to meet its water supply. ID4's total recovery capacity in average water years was 22,126 afy, which accounts for approximately 26 percent of the total recovery capacity available to ID4 (86,066 af).¹³

Table 8-4 identifies water supply and projected demand within the ID4 service area between 2010 and 2035 in normal, single-dry, and multiple dry years. As shown, ID4 is able to access and deliver 100 percent of its total annual water demands under all normal, single- and multiple-dry year scenarios. Deliveries made from ID4's banking programs meet water demand and supplement the annual SWP Table A allocation as needed.¹⁴ Table 8-4 shows that 86,066 afy of banked water was estimated to be available for 2010 demands in normal year and single-dry years, and a minimum of 40,130 afy of banked water is estimated to be available in future (2025+) multiple-dry years.¹⁵

ID4 has structured its participation in the water banking projects to provide sufficient recharge, storage, and recovery capacity to meet its water supply obligations. ID4's water banking projects allow ID4 to cushion impacts associated with SWP variability and re-regulate high flow waters for recovery during dry years.

8.2.3 KCWA Member Unit Tejon-Castac Service Area

TCWD provides water service to the Tejon Industrial Complex, located south of the junction of Interstate 5 (I-5) and State Route 99, and the Tejon Mountain Village Specific Plan area, located east of I-5 and surrounding Tejon Lake. Both are located in Kern County.

TABLE 8-4				
COMPARISON OF IMPROVEMENT DISTRICT NO. 4 WATER SUPPLY AND DEMAND, 2010–2035				
Total Water Supplies and Demand ¹	Projected Demands (afy) ¹			
	2010	2015	2025	2035
Normal Year				
Total Supply	169,012	157,012	151,072	151,072
Banked Groundwater Portion of Supply	86,066	74,066	68,126	68,126
Total Demand	25,000	48,000	50,500	53,000
Single-Dry Year				
Total Supply	91,872	157,012	151,072	151,072
Banked Groundwater² Portion of Supply	86,066	74,066	68,126	68,126
Total Demand³	26,250	50,400	53,025	55,650
Multiple-Dry Years				
Total Supply	114,268	72,142	68,332	68,332
Banked Groundwater Portion of Supply	86,066	43,940	40,130	40,130
Total Demand³	26,250	50,400	53,025	55,650
Notes:				
afy = acre-feet per year; SWP = State Water Project				
1. In 2012 and 2025, the contracts for the City of Bakersfield 2800 Acre Recharge Project and the ID4/Rosedale Joint Use Recovery Project are set to expire, respectively. A 12,000 and 5,940 afy reduction in overall banking capacity is shown.				
2. Groundwater recovery of previously banked supplies to supplement SWP Table A.				
3. Improvement District No. 4 assumes water demands in single- and multiple-dry years increases by 5 percent of the normal year water demands.				
Source: Kennedy/Jenks Consultants 2011; data compiled by AECOM in 2015				

TCWD's existing and future water supplies were estimated based on full buildout of proposed industrial uses in the Tejon Industrial Complex area and residential, commercial, and recreational land uses identified in the proposed TMV.¹⁶

The following discussion also relies on the TMV WSA. The WSA updated water supply and demand data identified in the 2005 UWMP reflect actual and projected water use at the Tejon Industrial Complex and refined land use plans for the proposed TMV.¹⁷ Therefore, the TMV WSA provides the most comprehensive dataset for the TCWD service area.

8.2.4.1 Water Supply and Demand

TCWD's water supply consists of a portion of KCWA's SWP Table A water, high-flow Kern River water, local groundwater from the White Wolf Basin, previously banked groundwater in the KWB and Pioneer Project, and recycled water. Table 8-5 summarizes average year and future water supplies.

TCWD has a 2.0 percent interest in the recharge and recovery facilities of the KWB as a result of the 1995 joint powers agreement between KWB participants and KWBA (see Revised Appendix E, Section V.B.2). For planning purposes, TCWD has estimated that it may request a maximum of about 6,000 afy from the KWB in the future. As of 2008, TCWD had 28,381 af of previously banked water in the KWB.¹⁸ TCWD is only able to recover water to the extent the water is TCWD banked water.

Supply	Average Year (afy)	Potential Supply (afy)
SWP Table A	3,325	5,278
High-Flow Kern River	--	187
Groundwater ¹	--	2,420
Recycled Water	1,158	1,700
Water Banking		
Kern Water Bank	4,000	6,000
Pioneer Project	750	1,000
Total	9,233	16,585

Notes:
afy = acre-feet per year
1. Groundwater only meets water supply demands for the Tejon Industrial Complex Area.
Source: TCWD 2008

Table 8-6 identifies water supply and demand within the TCWD service area between 2008 and 2028 in normal and single-dry years. Table 8-7 identifies water supply and demand within the TCWD service area over four multiple-dry years. As shown in Tables 8-6 and 8-7, TCWD is able to access and deliver 100 percent of its total annual water demands under all water year scenarios. Deliveries made from the TCWD's banking programs meet water demand and supplement the annual SWP Table A allocation as needed.

Total Water Supplies and Demand	Projected Demands (afy)			
	2008	2013	2018	2028
Normal Year				
SWP Table A	3,325	3,365	3,444	3,483
Recycled Water	1,158	1,158	1,158	1,158
Total Supply	4,483	4,523	4,562	4,641
Total Demand	4,102	4,102	4,102	4,102
Surplus	381	421	460	539
Single-Dry Year				
SWP Table A	317	330	343	369
Recycled Water	1,158	1,158	1,158	1,158
Total Supply	1,475	1,488	1,501	1,527
Total Demand	4,102	4,102	4,102	4,102
Extraction from Water Banks	2,627	2,614	2,601	2,575

Notes:
afy = acre-feet per year; SWP = State Water Project
Source: TCWD 2008; data compiled by AECOM in 2016

TABLE 8-7				
COMPARISON OF TEJON-CASTAC WATER DISTRICT WATER SUPPLY AND DEMAND FOR MULTIPLE-DRY YEARS				
Total Water Supplies and Demand	Projected Demands (afy)			
	Year 1	Year 2	Year 3	Year 4
SWP Table A	1,320	1,742	2,058	1,742
Recycled Water	1,158	1,158	1,158	1,158
Total Supply	2,478	2,900	3,216	2,900
Total Demand	4,102	4,102	4,102	4,102
Extraction	1,624	1,202	866	1,202
Notes:				
afy = acre-feet per year; SWP = State Water Project				
Source: TCWD 2008; data compiled by AECOM in 2016				

The County of Kern adopted Mitigation Measure 4.16-5 applicable to the TMV project. Mitigation Measure 4.16-5 states that prior to issuance of any building permit for residential housing, written verification must be provided from the TCWD that a 7-year indoor water supply for the number of dwelling units that have been constructed, or for which building permits have been issued, is reserved in the water banks for the TMV Specific Plan project. Mitigation Measure 4.16-5 further states that no building permits will be issued without the applicable reserve amount being available exclusively for the TMV Specific Plan area.

As stated in TCWD's 2005 UWMP and TMV WSA, TCWD is able to access and deliver 100 percent of its total annual water demands under all normal, single, single-dry, and multiple dry-year scenarios. In addition, the TCWD 2005 UWMP and WSA concluded that the reclaimed water strategy for the Tejon Mountain Village Specific Plan area and its water conservation in both services areas will maximize the use of all water resources.

8.2.4 KWB Water Used Outside the KWB Participants' Service Area

8.2.4.1 Direct Sales from KWB Participants

From 1996 through 2007, water was sold by KWB participants to the Environmental Water Account (EWA), a program that has since been discontinued. The EWA water was not growth-inducing because its primary purpose was providing water for fishery protection and recovery and providing assurances against additional water supply losses for urban and agricultural water supplies. From 1998 through 2008, other KWB participant water sales include water that went to agricultural entities within the San Joaquin Valley, a wildlife refuge, and a power plant located within Kern County. In addition to these types of sales, 4 percent of the water recharged and stored at the KWB can be purchased by adjoining groundwater districts within Kern County for overdraft correction purposes (see Revised Appendix E, Table 9A). During 2009 through 2014, there were no out-of-county sales of KWB water by KWB participants. Given the past history and current usage patterns, it is expected that sales to non-KWBA participants are likely to occur infrequently, if at all, outside of Kern County and would represent a small percentage of the total recovered KWB water by the KWBA participants. See Revised Appendix E, Section IV.A.3.

8.2.4.2 Other Water Transactions by KWB Participants

Water transfers and exchanges have historically been and continue to be a regular and critical part of water management in California, especially during dry years. Transfers are one-way transactions, where water from one agency is transferred to another, with no future return of that water. For KCWA, transfers with another agency are typically “landowner transfers,” where a landowner that owns land within both KCWA and another agency’s service area wants to transfer the water available to it from one agency for use on its land in the other agency’s service area. Exchanges are two-way transactions, where water from one agency or source is delivered to another agency, in exchange for the return of a specified quantity of water. An exchange may involve a change in the timing of delivery of water due to a critical need (e.g., one agency has a dry year water deficit which another agency can meet, and in return future water will be returned back to the providing water agency), or a change in the source of water delivered (e.g., water from a source available to one agency is delivered to another, in exchange for water from a different source). These transactions can provide a number of benefits, including improved water management, reduced costs for water delivery, and/or improved water quality. See Revised Appendix E, Section VI.A.2.

8.2.4.3 Use of Water by Irvine Ranch Water District via Dudley Ridge Water District

The KWB is designed to store water for later use by participants in Kern and Kings Counties. It is therefore expected that most KWB recovered water will remain within Kern and Kings Counties as it has in the past. However, some of the water may be used outside Kern and Kings Counties. Irvine Ranch Water District (IRWD) is a member unit of SWP Contractor Metropolitan Water District of Southern California; however, it now owns land within Dudley Ridge Water District (DRWD) as noted below. IRWD intends to bank some of its water supplies in the KWB for future use in its service area in Orange County.

IRWD acquired approximately 883 acres (the “Jackson Ranch”) located within the DRWD and its associated rights to use approximately 1,738 afy of Table A SWP allocated water. Additionally, acquisition of the Jackson Ranch land included certain participation rights in the KWB. According to IRWD’s 2010 UWMP, IRWD can store up to approximately 7,600 afy of water in the KWB. Total IRWD water supplies in 2010 from all sources were 151,751 afy.

8.2.5 Conclusions

The stored water supply that is made available as a result of the KWB contributes to meeting the needs of KWB participants ID4 and TCWD. In both cases, the KWB stored water is one of several water sources relied upon by these two water suppliers as well as other water management options (i.e., reclaimed water). Participation in the KWB provides greater flexibility for these water suppliers, allowing them to use surface water when it is available and bank water to use in dry years. Additionally, in 2011 IRWD obtained participation rights in the KWB through DRWD as a result of a land purchase in DRWD’s service area.

While an adequate water supply alone does not cause growth, it is a public service that supports growth. Other important factors influencing growth include: economic factors (such as employment opportunities); capacity of public services and infrastructure (e.g., wastewater, public schools, roadways); local land use policies; and land use constraints such as floodplains, sensitive habitat areas, and seismic risk zones.

Developing housing and implementing the services needed for population increases would generate impacts at locations where that growth would occur. The impacts of growth in ID4 and TCWD service areas have been analyzed in the City of Bakersfield and Kern County General Plan EIRs, respectively,

and the relationship between growth and water supplies has been analyzed in applicable UWMPs and water supply assessments. When new developments are proposed within the City of Bakersfield and Kern County, the City and County prepare project-level environmental documents pursuant to CEQA. Three key EIRs have concluded that urban projects that relied on several water sources including KWB recovered water would have significant and unavoidable impacts related to growth, as summarized in Section 8.1.2.3.

Growth in an area outside of the KWB participants' service area (such as with IRWD) would be similarly analyzed and mitigated by local planning authorities before it occurs. Identifying the specific locations and characteristics of growth in areas outside the KWB participants' service areas, and consequently the specific environmental impacts of that growth, can be characterized generally based on environmental impacts identified in general plans, UWMPs, and EIRs in the areas where this growth could occur and could be significant and unavoidable. See Section 8.1.2.3.

Development projects that rely upon KWB recovered water, along with other water supplies, have been found to result in significant and unavoidable impacts. Therefore, it is possible that KWB activities contribute to the significant and unavoidable impacts identified for those projects. The Department and KWBA lack the authority to approve or deny development projects or to impose mitigation to address significant environmental impacts associated with development projects; that authority resides with local cities and counties. As discussed in Section 8.1.2.4, Local Decision Making on Land Use Planning, decisions regarding growth are made through the general planning process at regional and local levels. Cities and counties in the service areas affected by the increased population are responsible for considering the environmental effects of their growth and land use planning decisions. Availability of water is only one of many factors that land use planning agencies consider when making decisions about growth. Identifying water demands and available sources to meet those demands is now something that urban water suppliers must do in the Urban Water Management Plans and that cities and counties must do in water supply assessments required for projects above a certain size. When new developments are proposed, the cities and counties prepare environmental documents pursuant to CEQA. In addition, numerous federal, state, regional, and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment. Where appropriate, they must consider feasible mitigation measures, feasible alternatives, and statements of overriding considerations.

ENDNOTES

- 1 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
- 2 Kern County. 2002 (November). *Final Environmental Impact Report Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 3 Kern County. 2005 (July). *Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 4 Kern County. 2009 (August). *Final Environmental Impact Report Tejon Mountain Village by TMV, LLC*. State Clearinghouse No. 2005101018.
- 5 Kern County. 2000 (February). *Tejon Industrial Complex Final Environmental Impact Report*. State Clearinghouse No. 99061016.
6. *Center for Biological Diversity, et al. v. County of Kern, et al.*, (Apr. 6, 2007, F050685) [nonpub. opn.], 2007 WL 1032268.
7. *Center for Biological Diversity v. Kern County*, unpublished decision, 2012 WL 1417682. April 25, 2012.
8. USFWS. 2013 (April). Tehachapi Uplands Multiple Species Habitat Conservation Plan Environmental impact Statement.
- 9 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
- 10 Tejon-Castac Water District. 2008 (July). Tejon Mountain Village Water Supply Assessment. Lebec, CA.
- 11 Kennedy/Jenks Consultants. 2011 (June). Kern County Water Agency Improvement District 4 and North of the River Municipal Water District 2010 Urban Water Management Plan.
- 12 Kennedy/Jenks Consultants. 2011 (June). Kern County Water Agency Improvement District 4 and North of the River Municipal Water District 2010 Urban Water Management Plan.
13. Kennedy/Jenks Consultants. 2011 (June). Kern County Water Agency Improvement District 4 and North of the River Municipal Water District 2010 Urban Water Management Plan.
- 14 Kennedy/Jenks Consultants. 2011 (June). Kern County Water Agency Improvement District 4 and North of the River Municipal Water District 2010 Urban Water Management Plan.
- 15 In 2012 and 2025, the contracts for the City of Bakersfield 2800 Acre Recharge Facility and the ID4/Rosedale Joint Use Recovery Project are set to expire, respectively. A 12,000 and 5,940 afy reduction in overall banking capacity is shown in Table 8-6.
- 16 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
- 17 Tejon-Castac Water District. 2008 (July). Tejon Mountain Village Water Supply Assessment. Lebec, CA.
- 18 Tejon-Castac Water District. 2008 (July). Tejon Mountain Village Water Supply Assessment. Lebec, CA.

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**9. RELIABILITY OF WATER SUPPLIES AND GROWTH
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

10. OTHER CEQA CONSIDERATIONS (REVISED AND NEW)

10. OTHER CEQA CONSIDERATIONS (REVISED AND NEW)

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the EIR must also identify (1) significant environmental effects of the proposed project, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, and (4) growth-inducing impacts of the proposed project.

The Introduction/Executive Summary, Appendix E Revised) and Chapter 7 and Chapter 12 of this REIR provide a comprehensive identification of the ~~proposed project's~~KWB activities' environmental effects, including the level of significance both before and after proposed mitigation measures. In addition, Chapter 8 of this REIR provides a comprehensive analysis of growth-inducing effects.

Section 15130(a) of the CEQA Guidelines requires that an EIR contain an assessment of the cumulative impacts that could be associated with project implementation. This assessment for KWB activities is included in Section 10.1, Cumulative Environmental Impacts and includes an analysis of indirect impacts from potential cropping changes.

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. The effects of the ~~proposed project~~KWB activities on various aspects of the environment are discussed in detail in Section 10.2, Significant and Unavoidable Impacts.

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the proposed project. This analysis is included in Section 10.3, Significant and Irreversible Environmental Impacts, for KWB activities.

Although not required by CEQA, this chapter includes an analysis of the ~~proposed project's~~KWB activities' potential impact on social and economic factors in Section 10.4, Environmental Justice.

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10.1 CUMULATIVE ENVIRONMENTAL IMPACTS (NEW)

10.1 CUMULATIVE ENVIRONMENTAL IMPACTS (NEW)

10.1.1 INTRODUCTION

This REIR cumulative impact analysis does not supersede the cumulative impact analysis of the Monterey Plus EIR but supplements the Monterey Plus EIR by focusing specifically on cumulative impacts related to KWB activities. The numbering of the impact statements in this chapter continues from where the Monterey Plus DEIR stopped. Therefore the first impact for this chapter is 10.1-23.

As defined in the California Environmental Quality Act (CEQA) Guidelines Section 15355, a cumulative impact is an environmental impact that is created as a result of the combination of the project evaluated together with other projects causing related impacts. CEQA requires that an EIR discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable (CEQA Guidelines Section 15130[a]). "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects (CEQA Guidelines Section 15065(a)(3)). If an incremental effect is not cumulatively considerable, then the lead agency does not need to consider that effect significant and must briefly describe the reason why (CEQA Guidelines Section 15130(a)).

CEQA Section 15130(b) states that the discussion of cumulative impacts need not provide as much detail as the discussion of the effects attributable to the project. The level of detail should be guided by what is practical and reasonable.

The following elements are necessary for an adequate discussion of significant cumulative impacts (CEQA Guidelines Section 15130(b)):

- A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.
- A defined geographic scope of the area affected by the cumulative effect and a reasonable explanation for the geographic limits identified.
- A summary of expected environmental effects that might be produced by those projects with specific reference to additional information stating where that information is available.
- A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

10.1.2 METHOD OF ANALYSIS

The Monterey Plus EIR cumulative impact analysis has been updated for this REIR by including past, present, and probable future water and other development projects that potentially could impact resources affected by KWB activities. The update includes: 1) using new information to update project status for projects relevant to KWB activities in the Monterey Plus EIR cumulative impact analysis, and

2) including additional projects related specifically to KWB activities such as water banking programs and projects in the Kern Fan area; regional and local development plans and programs; and related development projects in the city of Bakersfield and Kern County (Table 10.1-1). The criteria used to identify individual projects for consideration in this cumulative analysis included:

- 1) whether the project is under active consideration (generally indicated by issuance of a notice of preparation of an EIR by a lead agency);
- 2) whether the project would be operational or contemplated within the timeframe of the KWB activities; and
- 3) whether the project in combination with KWB activities would have the potential to affect the same resources.

If a project met all of these criteria, then it was considered reasonably foreseeable and was selected for inclusion in the cumulative impact analysis. It was then determined whether KWB activities could cause a cumulatively considerable incremental contribution to an overall significant cumulative impact on each resource from all projects shown in Table 10.1-1 combined, including KWB activities.

The cumulative impact analyses for each resource could be qualitative or quantitative, depending on each resource and available data. The qualitative analysis considered projects that are in the planning stage and are being discussed by various entities, and projects that are not quantifiable using other modeling or analytical programs. These cumulative projects were addressed qualitatively to disclose information about potential cumulative impacts. Some resources were analyzed quantitatively (i.e., surface water hydrology and groundwater hydrology, air quality, climate change, and growth). All other resource topics are qualitatively assessed.

The following are summary descriptions of the projects, grouped into similar categories, considered in this cumulative impact analysis.

10.1.2.1 Water Banking Programs and Related Projects

This section describes projects that have been included in the groundwater modeling assumptions for Section 7.1, Surface Water and Groundwater Hydrology, and described in Appendix 7-2. The water banking programs and related projects not included in the groundwater modeling are still applicable to the cumulative impact analysis and were considered qualitatively. The reasonable foreseeable projects listed in Table 10.1-1 could incrementally contribute to the cumulative impact to the environment when considered with KWB activities described in Revised Appendix E.

Kern Water Bank Authority

Future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Resources Water Management (IWRM) program (Kern Water Bank Recharge and Recovery Project). The IRWM program ponds have been sited whereas the locations of additional ponds are approximate but consistent with the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWB HCP/NCCP) requirements; final locations and areas will be determined as these facilities are designed. Future build-out of the KWB would include construction of approximately 862 acres of additional recharge ponds and associated facilities.

TABLE 10.1-1

PROJECTS CONSIDERED IN REVISED EIR CUMULATIVE IMPACT ANALYSIS

Line	Project	Criterion 1: Is the action under active consideration?	Criterion 2: Would the action be completed or operational within the timeframe being considered for the proposed project?	Criterion 3: Does the action, in combination with the proposed project alternatives, have the potential to affect the same resources?
Programs and Projects Related to Kern Water Bank Activities				
1	<u>Coordinated Long-Term Operation of the Central Valley Project and State Water Project</u>	√	√	No
2	<u>Proposed Long-Term Water Transfers of CVP Water for 2015-2024</u>	√	√	No
3	<u>CVP Water Transfer Program for the San Joaquin River Exchange Contractors for 2014–2038</u>	√	√	No
4	<u>SWP Water Supply Contract Extension Project 2014 to 2085</u>	√	√	No
5	<u>Isabella Lake Dam Safety Modification Project</u>	√	√	√
Water Banking Programs and Related Project Activities in the Kern Fan Subbasin				
Kern Water Bank Authority				
6	<u>Kern Water Bank Recharge and Recovery Project (Integrated Resources Water Management Program)*</u>	√	√	√
7	<u>Kern Water Bank Conservation and Storage Project</u>	√	√	√
8	<u>Kern Water Bank Short-Term Storage Program</u>	No	No	No
Arvin-Edison Water Storage District				
9	<u>Arvin-Edison Water Storage District/Metropolitan Water District Banking Program</u>	√	√	√
10	<u>Arvin-Edison Water Storage District Water Management Program; In-District Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
11	<u>Arvin-Edison Water Storage District and Westside Mutual Water Company, LLC. Water Supply Exchange Agreements 2011–2016</u>	√	√	√
12	<u>Arvin-Edison Water Storage District Intake Canal and Kern Delta Buena Vista River Canal Intertie Project</u>	No	No	No
13	<u>South Canal Balancing Reservoir Project</u>	No	No	No
Berrenda Mesa Water District				
14	<u>Berrenda Mesa Water Banking Project</u>	√	√	√
15	<u>Berrenda Mesa Property Joint Water Banking Project (BMWD/ID4)</u>	√	√	√
16	<u>Westside Districts' Groundwater Banking Project</u>	No	No	No
Buena Vista Water Storage District				
17	<u>Buena Vista Water Storage District Water Management Program (Groundwater Recharge and Recovery Project; Water Exchange Project Conservation Easement Water Acquisition and Management Project; Brackish Groundwater Remediation Project); Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
18	<u>Buena Vista Water Storage District/West Kern Water District Joint Water Supply Project (In Lieu/Direct Recharge Components)</u>	√	√	√
19	<u>Buena Vista/Rosedale–Rio Bravo Water Banking and Recovery Program</u>	√	√	√
20	<u>Buena Vista Water Storage District/Irvine Ranch Water District Exchange Agreements (2010 to 2038)</u>	√	√	√

TABLE 10.1-1

PROJECTS CONSIDERED IN REVISED EIR CUMULATIVE IMPACT ANALYSIS

Line	Project	Criterion 1: Is the action under active consideration?	Criterion 2: Would the action be completed or operational within the timeframe being considered for the proposed project?	Criterion 3: Does the action, in combination with the proposed project alternatives, have the potential to affect the same resources?
21	<u>James Groundwater Storage and Recovery Project*</u>	√	√	√
22	<u>California Aqueduct Turnout BV8</u>	√	√	√
23	<u>Water Use Efficiency Project</u>	√	√	√
24	<u>Palms Groundwater Banking Project</u>	√	√	√
25	<u>Northern Improvement Project</u>	No	No	No
26	<u>Kern Fan Direct Recharge and Recovery Project</u>	No	No	No
<u>Cawelo Water District Water Management Program</u>				
27	<u>Cawelo Water District/Dudley Ridge Water District Conjunctive Use Program</u>	√	√	√
28	<u>Cawelo–Modified Famoso Water Banking Project</u>	√	√	√
29	<u>Calloway Canal Lining Project*</u>	√	√	√
<u>City of Bakersfield</u>				
30	<u>City of Bakersfield 2800 Acre Groundwater Recharge Project</u>	√	√	√
31	<u>Kern River Flow and Municipal Water Program</u>	√	√	√
32	<u>Kern River Channel Maintenance Program</u>	√	√	√
<u>Kern Delta Water District</u>				
33	<u>Kern Delta Water District Groundwater Banking Program; In-Lieu Banking Program</u>	√	√	√
34	<u>Kern Delta/MWD Water Banking</u>	√	√	√
35	<u>Kern River Water Allocation Plan</u>	√	√	√
<u>Kern County Water Agency (ID4)</u>				
36	<u>Pioneer Project Banking Program</u>	√	√	√
	<u>Cross Valley Canal Extension Lining Project (Phase 1- Pool No. 7)</u>	No	√	√
37	<u>ID4 Joint Use Groundwater Recovery Programs (with Rosedale and BMWWD)</u>	√	√	√
38	<u>ID4/Kern Tulare & Rag Gulch Banking</u>	√	√	√
39	<u>Allen Road Complex Well Field Project</u>	√	√	√
40	<u>Cross Valley Canal Extension Lining Project (Phase 1— Pool No. 7)</u>	No	No	No
<u>North Kern Water Storage District</u>				
41	<u>North Kern Water District Groundwater Storage Project; Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
42	<u>Delano-Earlimart Irrigation District/North Kern Water Storage District Banking</u>	√	√	√
43	<u>Drought Relief Project</u>	√	√	√
<u>Rosedale–Rio Bravo Water Storage District</u>				
44	<u>Rosedale–Rio Bravo Water Storage District Groundwater Banking and Sale Program; In-District Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
45	<u>Rosedale–Rio Bravo Water Storage District and Kern Tulare & Rag Gulch</u>	√	√	√
46	<u>Rosedale–Rio Bravo Water Storage District Joint Use Groundwater Recovery Projects</u>	√	√	√
47	<u>Rosedale–Rio Bravo Water Storage District/Irvine Ranch Water District Exchange Agreements (2009 to 2039)</u>	√	√	√

TABLE 10.1-1

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Line	Project	Criterion 1: Is the action under active consideration?	Criterion 2: Would the action be completed or operational within the timeframe being considered for the proposed project?	Criterion 3: Does the action, in combination with the proposed project alternatives, have the potential to affect the same resources?
48	<u>Strand Ranch Integrated Banking Project</u>	√	√	√
49	<u>Stockdale West/Strand Ranch Water Banking Project</u>	√	√	√
50	<u>Drought Relief Project*</u>	√	√	√
<u>Semitropic Water District</u>				
51	<u>Semitropic Water District Banking Project</u>	√	√	√
52	<u>Semitropic In-District Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
53	<u>Semitropic/Metropolitan Water District et al. Water Banking</u>	√	√	√
54	<u>Semitropic/Shafter-Wasco Water Banking</u>	√	√	√
55	<u>Semitropic/Westlands Water District Water Banking</u>	√	√	√
56	<u>Semitropic/Santa Clara Valley Water District Water Banking</u>	√	√	√
57	<u>Semitropic/Poso Creek Mutual Water Company Water Banking</u>	√	√	√
58	<u>Semitropic/Madera Irrigation District Water Banking</u>	√	√	√
<u>West Kern Water District</u>				
59	<u>West Kern Water District Groundwater Banking Program</u>	√	√	√
60	<u>North Project Water Banking Expansion</u>	√	√	√
<u>Wheeler Ridge–Maricopa Water Storage District</u>				
61	<u>In-District Conjunctive Use/In-Lieu Recharge Program</u>	√	√	√
62	<u>Wheeler Ridge–Maricopa Groundwater Storage and Recovery Project</u>	No	No	No
<u>Lost Hills Water District</u>				
63	<u>Regional Brackish Water Treatment Project</u>	No	No	No
<u>Tejon-Castac Water District</u>				
64	<u>California Aqueduct Turnout for Tejon-Castac Water District</u>	√	√	√
<u>Regional and Local Development Plans and Programs</u>				
65	<u>Metropolitan Bakersfield General Plan*</u>	√	√	√
66	<u>Kern County General Plan*</u>	√	√	√
67	<u>Metropolitan Bakersfield Habitat Conservation Plan</u>	√	√	√
68	<u>Kern Council of Governments Regional Blueprint</u>	√	√	√
69	<u>Tehachapi Uplands Multiple Species Habitat Conservation Plan</u>	√	√	√
<u>Related Development Projects</u>				
<u>City of Bakersfield</u>				
70	<u>West Ming Specific Plan*</u>	√	√	√
71	<u>McAllister Ranch Specific Plan</u>	No	No	No
72	<u>Rosedale Ranch (approved residential development)*</u>	√	√	√
73	<u>Saco Ranch (approved commercial development)*</u>	√	√	√
74	<u>Strand Ranch (approved residential and commercial development)*</u>	√	√	√
75	<u>Stockdale Ranch (approved residential development)*</u>	√	√	√
76	<u>Old River Ranch (approved residential and commercial development)*</u>	√	√	√

TABLE 10.1-1				
PROJECTS CONSIDERED IN REVISED EIR CUMULATIVE IMPACT ANALYSIS				
Line	Project	Criterion 1: Is the action under active consideration?	Criterion 2: Would the action be completed or operational within the timeframe being considered for the proposed project?	Criterion 3: Does the action, in combination with the proposed project alternatives, have the potential to affect the same resources?
77	Bakersfield Commons (approved commercial development)*	√	√	√
78	Ashe No. 4 (approved residential development)*	√	√	√
79	Hosking Commercial Center (proposed commercial development)*	√	√	√
<u>Kern County</u>				
80	Tejon Mountain Village Specific and Community Plan	√	√	√
81	Tejon Industrial Complex Specific Plan	√	√	√
82	Grapevine Specific and Community Plan	√	√	√
83	Reina Ranch (proposed residential development and drill island for petroleum extraction)*	√	√	√
84	Rosedale & Referno Precise Development Plan*	√	√	√
85	Hydrogen Energy Power Plant	√	√	√
86	San Emidio Quarry Expansion	√	√	√
<u>Related Capital Improvement Projects</u>				
87	Centennial Corridor Project (Interstate 5 to State Route 58 alignment)	√	√	√
88	Rosedale Highway Widening	√	√	√
89	State Route 99 Auxiliary Land/Rosedale Highway Off-ramp Improvements	√	√	√
90	State Route 99/Hosking Avenue Interchange	√	√	√
91	State Route 178 at Morning Drive Interchange	√	√	√
92	State Route 99 Widening (8-Lane) Project, North Bakersfield	√	√	√
93	State Route 99 Widening (8-Lane) Project, South Bakersfield	√	√	√
<p>Notes: BMWD = Berrenda Mesa Water District; CVP = Central Valley Project; ID4 = Improvement District No. 4; Rosedale = Rosedale-Rio Bravo Water Storage District; SWP = State Water Project</p> <p>The decision-making criteria used to determine whether a project should be addressed in the cumulative impact analysis for the Revised EIR are listed in columns 2, 3, and 4 above. Projects determined to meet all three criteria are highlighted in gray and included in the cumulative analysis. For each of the three criteria listed above, a checkmark (√) is used to denote a “yes” decision. Unless otherwise noted above, projects that do not meet all three of the criteria were not included in the cumulative analysis discussed in this section.</p> <p>*Projects included in cumulative groundwater modeling analysis of KWB future operations.</p>				

The Kern Water Bank Authority (KWBA) also issued a Notice of Preparation in 2012 for the proposed Kern Water Bank Conservation and Storage Project, which would use existing facilities to divert additional water from the Kern River to increase reliability and enhance the dry-year water supply of KWBA’s participants through storage in the KWB.

Berrenda Mesa Joint Project

The Berrenda Mesa Project encompasses 369 acres and is located near the farthest most northeast corner of KWB Lands along both sides of the Kern River channel. The participating water districts

include Berrenda Mesa Water District (WD), Belridge Water Storage District (WSD), Kern Delta WD, Lost Hills WD, and Wheeler Ridge–Maricopa WSD.

The project began operations in 1983 with 250 acres of recharge basins along the south side of the Kern River channel. The recharge basins can receive deliveries of State Water Project (SWP), Kern River, and Cross Valley Canal (CVC) water through the Wilson Ditch intake canal. The facility also has access to 65 acres of the Kern River channel for recharge when the river is not flowing. Recovery from the facility is from 14 water production wells: eight on-site and six in the Pioneer Project. Recovered water from the production wells is pumped directly to the CVC by either individual pipelines from wells or manifolds of multiple wells to the CVC. Berrenda Mesa WD, Belridge WSD, and Lost Hills WD are located over 10 miles north, and recovered water is delivered by exchange from the California Aqueduct.

Buena Vista Water Storage District

Buena Vista Water Storage District (Buena Vista WSD) and Rosedale-Rio Bravo Water Storage District (Rosedale) are in the planning stages for the James Groundwater Storage and Recovery Project, bordering the southeastern border of the KWB. It would include construction and operation of 1,400 acres of shallow recharge ponds, water conveyance facilities, and up to 14 groundwater wells and well pumping plants. Recharge on the property is estimated at up to 150,000 acre-feet per year (AFY) with recovery of water of up to 50,000 AFY.

The project includes water conveyance to and from the property using local canals and facilities that may be available, including but not limited to, the CVC, Kern River, Friant-Kern Canal, California Aqueduct, Buena Vista Canal, 2800 Acre Groundwater Recharge Project, Pioneer Project, KWB, Berrenda Mesa Project, and Kern River Canal, subject to applicable rules and regulations. The project would be constructed, operated, and managed by Buena Vista WSD and Rosedale, although day-to-day operations, or portions thereof, may be contracted to other parties. Sources of water for recharge could include water from the Kern River, Friant-Kern Canal, SWP, Central Valley Project (CVP), and possibly other sources that may be available to Buena Vista WSD or Rosedale from time to time.

The Buena Vista WSD is also implementing the Buena Vista Water Management Program, which consists of four project components: Groundwater Recharge and Recovery Project (GRRP), Water Exchange Project (WEP), Conservation Easement Water Acquisition and Management Project (CEWAMP), and Brackish Groundwater Remediation Project (BGRP). The components are described as follows:

Component 1: The GRRP consists of groundwater recharge that would be conducted through direct recharge methods, in-lieu methods, or a combination, resulting in an additional annual recovery of up to 20,000 AFY.

Component 2: The WEP would allow the Buena Vista WSD to deliver portions of its water supplies to other entities in exchange for later return of more regulated water supplies, increasing its overall supply during dry years.

Component 3: The CEWAMP consists of acquiring and actively managing some or all of the water service rights within the district that have already entered into, or that will enter into, conservation easements programs and that have transitioned away from full agricultural production. This project would result in substantial water savings.

Component 4: The BGRP is designed to remediate brackish groundwater conditions and shallow, perched groundwater conditions within the Buttonwillow Service Area by recovering

brackish groundwater and shallow brackish perched groundwater from strategic locations within the district. Annual brackish groundwater recovery could lead to up to 12,000 AFY in additional water supplies.

California Department of Water Resources

The 2014 Sustainable Groundwater Management Act (SGMA) went into effect on January 1, 2015. The California Department of Water Resources (Department) is responsible for oversight and implementation of SGMA, which establishes a new structure for managing groundwater in California. SGMA requires development of projects and programs to achieve long-term basin sustainability and includes: a) formation of groundwater sustainability agencies (GSAs) for all basins designated as high or medium priority by the Department; b) development of a groundwater sustainability plan (GSP); and c) implementation of the GSP to avoid “undesirable result” (California Water Code Section § 10721(x)).

The Kern County subbasin (No. 5-22.14) has been designated a high priority basin by the Department. This means local agencies in this subbasin are required to form GSAs by June 2017, and to develop and adopt their GSPs by January 2020. Each GSP must include measurable goals and objectives, and implementation actions to achieve/maintain basin sustainability. The subbasin needs to be under sustainable management by 2040, by implementing monitoring, project implementation, and administrative actions.

City of Bakersfield

The City of Bakersfield has several sources of water supply for its urban customers. It can use surface water supplies from the Improvement District No. 4 (ID4) water treatment plant (from either the CVC or the Kern River), the California Water Service plant located at the mouth of the Kern River Canyon (Kern River water), or the City of Bakersfield treatment plant in northwest Bakersfield and groundwater delivered by various purveyors. Other agencies serving the unincorporated Bakersfield area include North of the River Municipal Water District and Oildale Mutual Water Company. These purveyors, and the city, purchase imported water (from state and federal water sources, mainly in the Sacramento-San Joaquin Delta area), through Kern County Water Agency (KCWA) and KCWA member unit, ID4. The City of Bakersfield can recharge water in its 2800 Acre Groundwater Recharge Project, the Parkway and Truxtun Lakes Facilities, and the Kern River channel.

In 1976, the City of Bakersfield entered into an agreement with Tenneco West Inc. to purchase Tenneco’s pre-1914 appropriative Kern River rights, yielding an average of 160,000 AFY of water. With the purchase of the water rights came 2,800 acres of land along the Kern River stretching approximately 6 miles between Renfro Road and Interstate 5 (I-5). Additionally, all of Tenneco’s canals and surface water conveyance facilities within the 2,800 acres and upstream of the facility went with the purchase.

The City of Bakersfield 2800 Acre Groundwater Recharge Project consists of 14 recharge basins and approximately 25 production water wells. Water for recharge can be delivered by the Kern River channel and the CVC. This water can derive from the Kern River, the SWP, or CVP sources via interconnections between the CVC, the Friant-Kern Canal (conveys CVP water), and the Arvin-Edison Canal (also conveys CVP water). Water recovered during dry years is delivered to the City of Bakersfield via pipelines or to water districts purchasing water via the City of Bakersfield River Canal. Between 1978 and 2007, approximately 1.3 million acre-feet (MAF) of water were recharged into the facility.

The City of Bakersfield also operates recharge facilities that consist of two ponds along Truxtun Extension (Truxtun Lakes), the Kern River channel within its city limits, and ponds in the vicinity of Allen

Road and Stockdale Highway (Parkway Facility). Water for recharge is delivered to these facilities via the Kern River channel and the CVC. Operation of the City of Bakersfield recharge facilities is the responsibility of the City of Bakersfield Water Department.

Improvement District No. 4

Pioneer Groundwater Recharge and Recovery Project

The Pioneer Project consists of approximately 2,233 acres of ponds on the Pioneer property, with the capacity to recharge 12,000 AF of water per month. The Kern River channel is considered to be part of the Pioneer Project. The group of participating water districts includes KCWA, Buena Vista WSD, Henry Miller WD, Kern Delta WSD, Rosedale, Wheeler Ridge–Maricopa WSD, Tejon-Castac WD (TCWD), Semitropic WSD, Lost Hills WD, Belridge WSD, Berrenda Mesa WD, and ID4.

The Pioneer Project participants and KCWA have rights to spread or recover water, or both, in (1) the Pioneer Property; (2) the City of Bakersfield 2800 Acre Groundwater Recharge Project; (3) the Kern River channel east of the 2800 Acre Groundwater Recharge Project; and (4) any land, other than the Pioneer Property, that KCWA has or acquires the use of for similar purposes. These rights provide a total recharge capacity of about 430 cubic feet per second (cfs).

In 1999, KCWA was awarded a \$5 million loan to fund construction of 11 new wells and rehabilitation of six existing wells described above on the Pioneer Property. During 1999 and 2000, KCWA constructed 11 new wells, adding approximately 33,000 AFY of recovery capacity for the Pioneer Project recovery participants and KCWA. The wells were completed in 2000. The loan was also used to construct pipelines from the wells to the CVC or Kern River Canal.

Rosedale-Rio Bravo Water Storage District

Rosedale-Rio Bravo Water Storage District Groundwater Storage, Banking, Exchange, Extraction and Conjunctive Use Program

Rosedale was formed in 1959 by an act of the California Legislature to develop a groundwater recharge program to offset overdraft conditions in the regional aquifer underlying the district. Rosedale is located to the north of the KWB. It is composed of approximately 44,150 acres, 28,500 of which are developed as irrigated agriculture and about 6,000 acres as developed urban use.

To meet the needs of its landowners, Rosedale has developed the Groundwater Storage, Banking, Exchange, Extraction and Conjunctive Use Program. This program includes six water entities that collectively can provide a maximum recharge of approximately 150,000 AFY and a maximum recovery of 45,750 AFY. Surface water for the Program is supplied by the participating entities through high-flow Kern River water, the CVP (via the Friant-Kern Canal), and the SWP (via the CVC). The infrastructure for the Program includes 1,400 acres of recharge ponds along the Goose Lake Slough, and seven recovery wells. High-flow Kern River waters can be diverted to Goose Lake Slough directly from the Kern River. SWP water via the CVC can be delivered to the recharge facilities via Rosedale's Turnouts 1 and 2. CVP water can be delivered to Rosedale via the Friant-Kern Canal Intertie or the Friant-Kern Kern River Intertie. The Buena Vista WSD East Side Canal can deliver either SWP water, Kern River water, or a mixture of both to the western portion of Rosedale.

Rosedale-Rio Bravo Water Storage District /ID4 Joint-Use Groundwater Recovery Program

Rosedale has partnered with ID4 in a joint-use groundwater recovery program which includes 45 cfs of well recovery, 60 cfs of transmission pipeline capacity, and 60 cfs of CVC capacity. Rosedale paid for

the construction of wells, pipelines, and turn-in facilities to the CVC, and ID4 operates and maintains the wells as part of its expanded Allen Road Well Field. This project was completed in 2007.

Rosedale-Rio Bravo Water Storage District /Irvine Ranch Water District Integrated Banking Project

Irvine Ranch WD was established in 1961 and receives SWP water from the Metropolitan Water District of Southern California. It provides potable and recycled water, sewage collection and treatment, and urban runoff treatment to municipal/industrial and agricultural customers within approximately 114,560 acres of service area in Orange County.

In 2004, Irvine Ranch WD purchased 611 acres of the former Strand Ranch, located adjacent to a portion of the northern KWB boundary. The CVC and Pioneer Canal run east-west through the middle of the project. Irvine Ranch WD currently participates in Rosedale's Conjunctive Use Program through its Strand Ranch Integrated Banking Project and was annexed into Rosedale. The Strand Ranch Project includes approximately 502 acres of recharge basins and seven recovery wells. Irvine Ranch WD has the ability to store up to 50,000 AF and to recover 17,500 AFY in accordance with its banking project terms with Rosedale. Buena Vista WSD also participates in this project.

Surface water (SWP, CVP, and Kern River) for groundwater recharge is delivered to the Strand Ranch project via turnouts and siphons from the CVC, the Rosedale West Intake Canal, and the North and South Supply Canals along the eastern boundary of the project. Recovered water is transported to the CVC via pipelines connecting multiple water production wells from both the northern and southern portions of the project.

West Kern Water District/Buena Vista Water Storage District Joint-Use Recharge Facility

West Kern WD and Buena Vista WSD operate a joint-use recharge facility within the West Kern WD well field. The recharge facility is located adjacent to the KWB along its northern, eastern, and southern boundaries. It is composed of 10 recharge basins and approximately 14 water production wells. The facility receives water via the Kern River through the West Kern WD–Buena Vista WSD Diversion Works and also from the California Aqueduct via the KWB Canal and the Buena Vista WSD Main Canal.

Additionally, West Kern WD has purchased land in the vicinity of the northwestern portion of the KWB and the southern end of Buena Vista WSD for groundwater banking and recovery operations. It entails an eventual build-out of approximately 480 acres of recharge basins; water production wells for approximately 24,000 AFY of recovery; and additional turnouts from the CVC, KWB "W" Ponds, and the Buena Vista WSD East Side Canal. Turn-in facilities for delivery of recovered water are from conveyance pipelines that connect the water production wells into the Buena Vista WSD East Side Canal, the CVC, and the KWB Canal, in addition to a turn-in to the California Aqueduct.

10.1.2.2 Region and Local Plans and Programs

Metropolitan Bakersfield General Plan

The *Metropolitan Bakersfield General Plan* is a joint planning document adopted by both the County of Kern and the City to provide for a cohesive planning effort for the entire metropolitan Bakersfield area. The boundaries of the planning area were mutually agreed upon by the City of Bakersfield and Kern County as part of the joint adoption of the *Metropolitan Bakersfield General Plan* and represent the area where planning and land use decisions could affect both Bakersfield and Kern County (see Figure 7.10-1 in Section 7.10, Land Use and Planning).

The *Metropolitan Bakersfield General Plan* was adopted by the Kern County Board of Supervisors on December 3, 2002, and was last amended on December 11, 2007. The *Metropolitan Bakersfield General Plan* is a policy document designed to give long-range guidance for decision-making affecting the future character of the Metropolitan Bakersfield planning area and represents the official statement of the community's physical development as well as its economic, social, and environmental goals.

Kern County General Plan

KWB Lands fall within both the *Kern County General Plan* and the *Metropolitan Bakersfield General Plan* (Unincorporated Planning Area) (see Figure 7.10-1 in Section 7.10, Land Use and Planning). The *Kern County General Plan* was adopted by the Kern County Board of Supervisors on June 15, 2004, and was last amended on September 22, 2009. The *Kern County General Plan* identifies policies that provide long-range guidance to county officials who make decisions that will affect growth and resources in unincorporated Kern County, excluding the unincorporated portion of the county within the metropolitan Bakersfield planning area. The general plan helps ensure that day-to-day planning and land use decisions conform with the long-range program. The plan is reviewed and updated periodically as the goals and requirements of the community evolve.

The general plan encourages economic development that creates jobs and capital investments in urban and rural areas that benefits residents, businesses, and industries, as well as ensuring future governmental fiscal stability while encouraging new development to use existing infrastructure and services wherever feasible in the County's urban areas and ensures the protection of environmental resources and the development of adequate infrastructure with specific emphasis on conserving agricultural areas, discouraging unplanned urban growth, ensuring water supplies and acceptable quality for future growth, and addressing air quality issues.

Metropolitan Bakersfield Habitat Conservation Plan

The goal of the Metropolitan Bakersfield Habitat Conservation Plan (MBHCP) is to acquire, preserve, and enhance native habitats that support endangered and sensitive species, while allowing urban development to proceed as set forth in the *Metropolitan Bakersfield General Plan*. The MBHCP includes implementing agreements and ordinances, identifying specific methods for collecting funds for the acquisition and perpetual management of habitat land.

The MBHCP is intended to meet the requirements of both state and federal endangered species acts. In addition, the MBHCP complies with state and federal environmental regulations set forth in the National Environmental Policy Act and CEQA. The study area covered by the MBHCP contains both City and Kern County jurisdictions. Upon payment of required mitigation fees and receipt of City project approval, a development applicant would become a sub-permittee and would be allowed the incidental take of species in accordance with state and federal endangered species laws.

Kern Council of Governments Regional Blueprint

The Kern Regional Blueprint Program, led by the Kern Council of Governments, sets forth principles for growth in the Kern region that will help inform decision-making in local communities. These principles focus on: conserving energy and natural resources; providing adequate and equitable services; enhancing economic vitality; providing a variety of housing choices; using and improve existing community assets and infrastructure; using compact, efficient development and/or mixed land uses where appropriate; providing a variety of transportation choices; conserving undeveloped land and spaces; and increasing civic and public engagement.

Tehachapi Uplands Multiple Species Habitat Conservation Plan

The Tehachapi Uplands Multiple Species Habitat Conservation Plan (Tehachapi Uplands MSHCP) provides an Incidental Take Permit under the U.S. Fish and Wildlife Service (USFWS Section 10(a)(1)(B) for 25 federally protected species within 141,886-acres of the 270,365-acre Tejon Ranch. (see discussion of Tejon projects below in Related Development and Capital Improvement Projects). The Tehachapi Uplands MSHCP is designed to preclude development of approximately 91 percent of the 141,886 acres of land covered under this plan. The length of the plan is for 50 years.

10.1.2.3 Related Development and Capital Improvement Projects

Table 10.1-1 identifies related development and capital improvement projects considered in the cumulative impact analysis. These projects are in the general location of KWB and some impacts could be cumulative with KWB activities. TCWD provides water supplies to the Tejon Industrial Complex project and to the Tejon Mountain Village (TMV) for residential, commercial, and recreational land uses.¹ Because these major development projects receive KWB water, they are summarized below.

Tejon Industrial Complex

The Tejon Industrial Complex includes a master-planned industrial complex and supporting commercial uses which serve commerce along the I-5 transportation corridor between Bakersfield and Los Angeles. The project site is located between I-5 on the east and Tecyua Creek on the west, near the Wheeler Ridge/Laval Road interchange, and north of the California Aqueduct. Three large warehouses have been built as part of a major industrial complex, which also includes restaurants, automobile service stations, and a large truck stop.

Tejon Mountain Village

The project site is approximately 26,417 acres located in southwestern Kern County east of I-5. The project includes 3,450 residences; up to 160,000 square feet of commercial development; hotel, spa, and resort facilities, which include up to 750 lodging units; and up to 350,000 square feet of facilities in support of two 18-hole golf courses, riding and hiking trails, equestrian facilities, two helipads, fire stations, private community centers, electrical sub-station facilities, permanent and interim water treatment and wastewater treatment facilities; access and utilities to serve the project; and ranchland and other undeveloped open space. Approximately 21,335 acres (80%) of the site is preserved as ranchland and other undeveloped open space.

TCWD provides water supplies to the Tejon Industrial Complex area and for residential, commercial, and recreational land uses as part of the Tejon Mountain Village (TMV).² Environmental impacts for these projects are analyzed in the *Tejon Industrial Complex Final Environmental Impact Report, Final Environmental Impact Report Tejon Industrial Complex East Specific Plan, Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan, and Final Environmental Impact Report Tejon Mountain Village by TMV, LLC*.^{3,4,5,6} The environmental impact analyses and cumulative impacts analyses from these documents are summarized in Chapter 8, Growth-Inducing Impacts.

Tejon Industrial Complex EIR

The Tejon Industrial Complex EIR (State Clearinghouse No. 99061016) was circulated for public review and adopted by Kern County in February 2000. The project included a master-planned industrial complex and supporting commercial uses which were intended to serve commerce along the Interstate 5 (I-5) transportation corridor.

Tejon Industrial Complex East EIR & Supplemental Analysis EIR

The Tejon Industrial Complex East Specific Plan EIR (State Clearinghouse No. 2001101133) was circulated for public review and adopted by Kern County on January 21, 2003. The project included a 1,100-acre Specific Plan General Industrial development and rezoning of agricultural land to general industrial, on a site located east of I-5 at the Wheeler Ridge/Laval Road interchange near the base of the Grapevine Pass in unincorporated Kern County.

Subsequent to the certification of the Tejon Industrial Complex East Specific Plan EIR, various parties challenged the County's certification and project approval in an action in Kern County Superior Court (the Court), entitled *Center for Biological Diversity; Center on Race, Poverty, and the Environment; the Sierra Club; and Kern Audubon Society v. County of Kern* (2003). A Supplemental Analysis, in accordance with the Court's direction, was prepared that provided new technical information on air quality and biological resources; evaluated the project for impacts to air quality and biological resources; identified mitigation measures and design features, as necessary, that would reduce the impacts to air quality and biological resources; and provided a determination of the level of significance of these impacts. The applicant also revised the Tejon Industrial Complex East Specific Plan based on supplemental analysis of air quality impacts.

Tejon Mountain Village Specific Plan EIR

The TMV Specific Plan EIR (State Clearinghouse No. 2005101018) was circulated for public review and adopted by Kern County on October 5, 2005. The project consisted of implementing the Tejon Mountain Village Specific and Community Plan, and also the Tejon Mountain Village Special Plan and related rezoning on approximately 26,417 acres in southwestern Kern County.

Potential Environmental Impacts from Development and Capital Improvement Projects

In general, land that would be converted to urban uses along transportation routes and on the fringes of existing urban and suburban areas is typically undeveloped or used for agriculture. Conversion to urban uses of agricultural lands removes this land permanently from being available for agricultural production. In addition, conversion of agricultural or undeveloped lands eliminates most of the wildlife habitat value of these lands. Landform and drainage patterns could be altered, with natural drainage channels largely replaced by engineered storm water systems. Impermeable roofs, parking lots, and roadways could replace permeable surfaces with a consequent increase in storm water runoff and a decrease in groundwater recharge. Various substances associated with homes, yards, and vehicle use (paints, pesticides, plasticizers, oil and grease, brake dust, pet wastes, etc.) could be deposited on urban surfaces and conveyed to natural waterways. The introduction of people and vehicles into previously unpopulated or lightly populated areas could increase traffic, noise levels, air pollutant emissions, the generation of sanitary wastewater and solid waste, and the demand for local services.

TCWD provides water supplies to the Tejon Industrial Complex area and residential, commercial, and recreational land uses identified in the proposed Tejon Mountain Village (TMV).⁷ Environmental impacts for these projects, described above, are analyzed in the *Tejon Industrial Complex Final Environmental Impact Report*, *Final Environmental Impact Report Tejon Industrial Complex East Specific Plan*, *Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan*, and *Final Environmental Impact Report Tejon Mountain Village by TMV, LLC*.^{8,9,10,11}

These key environmental documents prepared for large development and capital improvement projects in the area identified impacts that would remain significant and unavoidable because no feasible mitigation is available to reduce impacts to a less-than-significant level. The significant and unavoidable environmental impacts identified in the Industrial Complex East EIR and Supplemental Analysis EIR

and the TMV EIR are summarized in Chapter 8, Growth-Inducing Impacts, and include some of the following types of environmental impacts that could result from construction and operation of related development and capital improvement projects shown in Table 10.1-1:

- **Aesthetics**—Temporary and permanent degradation of visual character for developed land uses during construction and operation and creation of new light, glare, and skyglow.
- **Agricultural Resources**—Conversion of Important Farmland to nonagricultural urban uses; cancellation of Williamson Act contracts; conflicts with and disruption of existing agricultural operations; and conflicts among agricultural operations and new residential, commercial land uses, or other facilities, such as parks and schools.
- **Air Quality and Global Climate Change**—Temporary, short-term construction-generated emissions of criteria air pollutants, such as particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (i.e., PM₁₀), and emissions of ozone precursors (e.g., reactive organic gases [ROG] and oxides of nitrogen [NO_x]); long-term operational-generated emissions that exceed SJVAPCD thresholds for criteria air pollutants (PM₁₀, ROG, and NO_x), exposure of sensitive receptors to toxic air contaminants and odors; long-term emissions of criteria air pollutants or local mobile-source carbon monoxide; emissions of greenhouse gases; and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions.
- **Biological Resources**—Loss and degradation of habitat for special-status wildlife and plants; potential loss and degradation of jurisdictional wetlands and other waters of the United States or waters of the state; and impacts on fisheries resulting from changes in discharge to local waterways and the Kern River.
- **Cultural Resources**—Loss of or damage to known and as-yet-undiscovered cultural resources and human remains during construction.
- **Geology, Soils, and Paleontological Resources**—Temporary, short-term construction-related erosion; damage to structures and infrastructure from seismic activity; construction on expansive/unstable soils and soils with high shrink-swell potential; and loss of or damage to known and to as-yet-undiscovered paleontological resources during construction.
- **Hazards and Hazardous Materials**—Exposure of construction crews and the public to contaminated soil, groundwater, and hazardous materials used in construction or present in excavated soils or from the routine transport, use, and disposal of hazardous materials; temporary road hazards caused by lane closures, increased truck traffic, and other roadway impacts during construction; and exposure to wildlife collision hazards.
- **Hydrology and Water Quality**—Increased stormwater discharges of suspended solids, increased turbidity, and potential mobilization of other pollutants from project construction sites; and hydrologic and water quality impacts from discharge to local waterways and the Kern River.
- **Land Use and Agricultural Resources**—Conflict with Kern County or the City of Bakersfield General Plan policies, land use designations, or zoning; physically division of an established community; or incompatible land uses with adjacent agricultural land uses.
- **Population and Housing**—Induce substantial population growth in Kern County and the City of Bakersfield through construction of new homes and businesses or through the extension of roads or other infrastructure or displace people or existing housing that necessitates the construction of replacement housing elsewhere.
- **Public Services**—Increase demand for fire protection facilities and services, including the City of Bakersfield Fire Department, Kern County Fire Protection District, and Kern County Fire Department facilities and services; law enforcement facilities and services, including the City of

Bakersfield Police Department, Kern County Sheriff's Department, and California Highway Patrol facilities and services; schools; parks; or other public facilities, thus necessitating the construction of new or expansion of existing public facilities.

- **Recreation**— Increase the use of existing neighborhood and regional parks or other recreational facilities (e.g., Kern River Parkway Trail), such that substantial physical deterioration of the facility would occur or be accelerated.
- **Noise**—Temporary, short-term exposure of sensitive receptors to noise levels above noise ordinances during construction and long-term exposure of sensitive noise receptors to new stationary-source noise and increased vehicular-related traffic that exceed County noise standards.
- **Traffic and Transportation**— Conflict with the City of Bakersfield or Kern County ordinances, policies, or programs establishing measures of effectiveness for the performance of the circulation system or those related to bicycle or pedestrian facilities; result in traffic hazards from incompatible urban land uses and adjacent agricultural land uses; or result in inadequate emergency access; and increase traffic near centers of regional development.
- **Utilities and Service Systems**—Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities; increase demand for water supplies, including water supplies provided by the City of Bakersfield, ID4, and TCWD; require the construction of new stormwater drainage facilities; or generate solid waste beyond the capacity of existing landfills.

10.1.3 KERN COUNTY AND SOUTHERN SAN JOAQUIN VALLEY DESCRIPTION

The KWB is located in Kern County in the southern San Joaquin Valley. The economy is primarily linked to agriculture and to petroleum extraction. Groundwater banks are numerous in the area. The area has been heavily developed by agriculture, petroleum extraction, and urbanization. Natural habitats are limited, and many special-status species occur in the area because of the low level of development. Kern County has approximately 80% of the State's active oil wells. The area is also a significant producer of natural gas, hydroelectric power, wind turbine power, and geothermal power. The area is noted for its mineral wealth, including gold, borate, and kermite.

Surface Water

The Kern River is the primary surface water feature in Kern County. It originates in the southern Sierra Nevada and flows westward into the San Joaquin Valley. Upstream Lake Isabella Reservoir provides flood control, recreation, and water storage of the Kern River. The valley is arid, typically receiving five inches of rainfall over the valley floor and nine to thirteen inches in the foothills. Because of low rainfall, permeable surface soils and relatively flat terrain, little surface runoff occurs on the valley floor and there is a limited network of natural surface drainage channels. The few natural streams are ephemeral. The most prominent surface water features are manmade irrigation canals.

Before European settlement, the Kern River flowed to Kern and Buena Vista Lakes and extensive wetlands. During wet periods, the lakes overflowed to Tulare Lake to the north, which itself overflowed into the San Joaquin River watershed. Groundwater levels in the basin varied but reached artesian conditions in the lowest parts of the basin.

Geology

The San Joaquin Valley basin is bordered to the south and east by the Sierra Nevada and Tehachapi mountains, which are composed of crystalline igneous and metamorphic rock. Exposed consolidated marine sedimentary rock from the Coast Range are evident in the layer of sediment above bedrock

underlying the San Joaquin basin. The KWB is located within a large, deep, and symmetrical sedimentary basin located in the southern portion of the San Joaquin Valley. The marine sedimentary rock is overlain by a thick series of continental rocks and semi-consolidated to unconsolidated sediments. These sediments are several thousand feet thick and encapsulate the primary groundwater basin. This area of the groundwater basin is dominated by alluvial fan and lake material. Groundwater development is limited to the upper portions of the fresh water aquifer system in this basin.

The southern San Joaquin Valley, including the Kern Fan Element, is dominated by the alluvial fan deposited by the Kern River, and consists of thick deposits of sand and gravel with extensive but discontinuous silt and clay beds. The sand and gravel deposits are remnants of old streambed channels which generally occur in long, winding, and interconnecting stingers and sheets that are prevalent throughout the Kern Fan Element, but less evident along its borders. These sand and gravel deposits are highly permeable, but are imbedded with less permeable areas comprised of fine-grained silt and clay deposits. These silt and clay deposits are more extensive along the edges of the alluvial fan and in some areas may intersect with clay beds deposited in lakes. In general, the upper layers of the alluvial fan deposits form an unconfined to semi-confined aquifer system that provides a large amount of groundwater recharge area.

Soils in the southern portion of the San Joaquin Valley range from highly permeable, coarse sandy soils to silty loam with very low permeability. In general, the soils present are characterized as deep, well-drained sandy loam that have moderate to rapid permeability with low water retention, and have a slight erosion potential. These soils are interspersed with pockets of clay deposits that are characterized by low-permeability and are often associated with saline-alkali conditions.

Groundwater

The Department divides the San Joaquin Valley Groundwater Basin into subbasins, one of which is the Kern County Subbasin, where the KWB is located. The Kern County subbasin lies at the south end of the San Joaquin Groundwater Basin. The San Joaquin Valley was formed by deposition of sediment in a north-northwestern trending trough. The aquifer system in the valley consists of continental and marine deposits several miles deep. The upper 2,000 feet generally contain fresh groundwater, with saline water at greater depths. The sediments that contain the aquifer system are primarily Tertiary– and Quaternary–aged continental sediments derived from the Coast Range to the west and the Sierra Nevada to the east. Overlying these formations are flood plain deposits. A significant hydrogeologic feature is the Corcoran Clay. This clay layer divides the aquifer system into two distinct aquifers, an unconfined to semi-confined upper aquifer above the clay layer and a confined aquifer below it. However, the clay layer is not continuous, and is absent in portions of the Kern County Subbasin.

Historically, the upper aquifer system in the Kern County Subbasin was recharged by precipitation, infiltration from rivers and lakes, and lateral inflow along the basin boundaries.

Agriculture

Historically, shallow lakes and seasonal wetlands occupied much of the valley floor. In the early part of the twentieth century, the lakes and wetlands were drained and the valley bottom converted to agricultural use. Soils in the valley portion of Kern County have two general origins, delineated approximately by the trough of the valley. The eastern alluvial fans were developed from a much higher energy environment, deposited by the precipitation and runoff of the Sierra Nevada. The soils are mostly of granitic origin, well drained, absent of salinity, with large well developed groundwater basins and ideal for agriculture. However the western alluvial fans originated from sedimentary rock formed on the sea bottom and consequently resulted in poorly drained soils of marginal quality. Most of the soils on the west side of the valley required some reclamation before crops could be grown profitably.

Now, most of the southern San Joaquin Valley portion of Kern County is devoted to agriculture. Because the climate is arid, with an average of less than six inches of annual precipitation, almost all crops must be irrigated. There are many irrigation districts in the San Joaquin Valley portion of Kern County. The first irrigation districts were originally formed to deliver local surface water. Additional districts formed when the SWP and the Friant-Kern Canal, a part of the CVP, were built. KCWA was created by the state legislature and ratified by the electorate in Kern County in 1961. KCWA has the authority to acquire and contract for water supplies for the county. It has additional powers to manage flood and storm waters and to protect the quality of underground waters. Water sources in Kern County include local ground and surface water and imported water from the SWP and CVP. SWP water represents as much as 50 percent of the San Joaquin Valley portion of Kern County's supply in some years.

Kings County lies north of Kern County on the western side of the floor of the San Joaquin Valley. A large portion of the farmland in the county lies on the historical Tulare Lake bed. High water tables and clayey and saline soils in portions of the valley floor in Kings County influence the type of crops planted. Soil reclamation was necessary in some areas before any crops could be farmed. Farmland occupies 85 percent of the county. The climate is arid and almost all crops are irrigated. Agricultural lands in Kings County are served by three water districts: Kings County WD, Dudley Ridge WD, and Tulare Lake Basin WSD. Kings County WD boundaries encompass 143,000 acres of land. The district obtains most of its water supplies from the Kings and Kaweah Rivers. SWP water represents less than five percent of Kings County WD supplies. Tulare Lake Basin WSD boundaries encompass 178,000 acres of land, and most of the district lies within lands formerly occupied by Tulare Lake. Its sources of water include the Kings and Tule Rivers, groundwater, and the SWP. Dudley Ridge WD boundaries encompass 37,660 acres of land, about half of which is irrigated. Almost all its water is obtained from the SWP.

In the 1860s, ranchers raised livestock and dry farmed wheat in the San Joaquin Valley portion of Kern County. In the 1870s, farmers began diverting the waters of the Kern River to irrigate their crops. For two decades, irrigators relied almost exclusively on surface waters for their water supplies, but in the 1890s, some took advantage of improvements in pumping technology and began turning to more reliable groundwater supplies. Increasing use of groundwater caused the water table in parts of Kern County to fall by as much as 400 feet by 1960. Groundwater extraction between 1926 and 1970 has contributed to subsidence in the Kern County Groundwater Subbasin. Surface water imports to the area began in 1949 with the completion of the CVP's Friant-Kern Canal and increased in the 1960s and 1970s, as water from the SWP became available. Many irrigators contracted for deliveries of imported surface water and were able to reduce their use of groundwater. As a result, groundwater levels in some parts of the southern San Joaquin Valley began to rise.

Conjunctive Use

KCWA, the largest of the SWP's agricultural contractors, and other water agencies use both surface and groundwater in the San Joaquin Valley portion of Kern County. Their surface water sources include flood flows from the Kern River, CVP deliveries from the Friant-Kern Canal, and SWP deliveries from the California Aqueduct. Their groundwater source is the aquifer that underlies much of the land within the KCWA boundaries.

For many years, water agencies in the Southern San Joaquin Valley have practiced conjunctive use of their surface and groundwater sources; that is, they use their surface and groundwater sources to take advantage of the unique characteristics of each type of water source. Water agencies use in-lieu recharge and direct recharge practices. In-lieu recharge is a water management practice that modifies the irrigation practices of water users who have access to surface water supplies and groundwater supplies. It substitutes surface water for irrigation in-lieu of groundwater pumping to increase

groundwater supplies and conserve groundwater for use in future years. Direct recharge (artificial recharge) is applied water to recharge ponds to increase groundwater recharge, and for later extraction.

When surface waters are available from the Kern River, the CVP, or the SWP, farmers use surface waters to irrigate crops. When surface water supplies are insufficient, farmers supplement their surface water supplies with groundwater. When surface water availability exceeds farmers' (and municipal) needs, water agencies with groundwater recharge facilities will pump water into ponds for eventual recharge into the groundwater basin.

Southern San Joaquin Valley water agencies manage groundwater banks for use by other non-local water agencies, as well as their own in-county use. These agencies will store non-Kern County agencies' water in Kern County groundwater basins for later recovery. The "managing" agency can recover the water by direct pumping and conveyance of the water to the non-Kern County water agency, or through an in-lieu exchange. Under an in-lieu exchange, SWP or non-SWP surface water that would otherwise have been delivered to the Kern County water agency would instead be delivered to the non-Kern County water agency, and the Kern County agency would pump a like amount of the non-Kern County agency's stored water.

10.1.4 CUMULATIVE IMPACT ANALYSIS

The cumulative impact analysis takes into consideration whether the projects listed in Table 10.1-1 in combination with KWB activities would have the potential to affect the same resources. If there is not a combined effect, then a finding of no impact is made. If there would be a combined effect, then a determination is made whether (1) that combined effect would result in a significant cumulative effect, and (2) whether the incremental contribution of KWB activities to the effect would be cumulatively considerable. If both conditions occur, a determination is made as to whether feasible mitigation measures are available to reduce the KWB activities' incremental contribution to the significant cumulative impact to a less-than-cumulatively-considerable level and/or the overall significant cumulative impact to a less-than-significant cumulative impact.

If a technical issue area included a project-specific impact as a result of implementation of KWB activities, a cumulative context is presented. The context of the cumulative analysis varies by technical issue area. For example, air quality impacts are evaluated against conditions in the relevant air basin. The cumulative impact analysis is presented below by technical issue area.

10.1.5 KERN WATER BANK ACTIVITIES

10.1.5.1 Surface Water and Groundwater Hydrology

Section 7.1, Surface Water and Groundwater Hydrology, includes a cumulative impact analysis by including certain past, present, and probable (reasonably foreseeable) future projects in its modeling scenarios. Section 7.1 describes the methodology used to quantify cumulative impacts. For model-based analysis of groundwater hydrology, the appropriate analysis for cumulative impacts is the Analysis of Future Operations – Build-Out Conditions (AFO-BC scenario) in Section 7.1. The AFO-BC scenario includes probable future projects and conditions to the extent they could be modeled.

The future projects considered in the AFO-BC modeling analysis are identified in Table 7.1-2 and shown in Figure 7.1-3 (projects are also identified in Table 10.1-1 of this section). Because of the length of Section 7.1, and its coverage of cumulative impacts, this section presents a qualitative analysis that is based on the AFO-BC quantitative analysis in Section 7.1.

KWB activities would have only minor less-than-significant effects on flood-related impacts (see impacts 7.1-3, 7.1-4, 7.1-5, and 7.1-6 in Section 7.1). There is not a significant cumulative impact related to flooding, and the KWB activities would not make a cumulatively considerable incremental contribution. Therefore, flood-related cumulative impacts are not discussed further.

10.1-23 Implementation of KWB activities in combination with regional and local water banking projects could potentially deplete groundwater supplies so that a net deficit in aquifer volume of stored groundwater would occur.

As discussed in Impact 7.1-1 under 2015 – 2035 (AFO-BC), KWB activities would not deplete groundwater supplies in any substantial manner to cause a net deficit in aquifer volume of stored water. At the end of the 1995–2014 historical KWB modeled operations, an accumulated balance of about 617,000 AF of stored water existed from past KWB activities. When this prior balance is added to the additional water stored during the 2015–2035 period, there is a balance of 1,115,348 AF of stored water at the end of 2035 under the AFO-BC scenario, assuming a repeat of hydrology similar to the 1995-2014 period. This shows that future KWB activities under build-out conditions would not deplete groundwater supplies to cause a net deficit in aquifer volume of stored water; rather, KWB activities would add about 498,000 AF of water into storage during future operations from 2015 through 2035, under build-out conditions.

Therefore, the impact of KWB future operations under build-out conditions from 2015 to 2035 on groundwater supplies, such that a net deficit in aquifer volume of stored groundwater would occur, would be less than significant and would not make a cumulatively considerable incremental contribution to a significant cumulative impact. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-24 Implementation of KWB activities in combination with regional and local water banking projects could potentially deplete groundwater supplies so that a lowering of the local groundwater table level would occur (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

The impact of lowering groundwater elevations because of future KWB operations under the build-out (2030) level of development would be potentially significant. Consecutive years of recovery may cause groundwater levels to decrease such that some existing wells in an area immediately outside KWB Lands could become inoperable, thereby reducing short-term water supplies and adversely affecting land uses dependent on these supplies. However, whether the impact actually would be significant (i.e., substantial) would depend on several factors, including the specific field conditions and physical characteristics of the agricultural and domestic wells in the affected area (e.g., well location, operational depth of the well pump, pump efficiency, and overlying land use). All groundwater banks generally have similar operations: recharge when water supplies are available and recovery when water supplies are scarce. Consequently, numerous water banks adjacent to the KWB and in the same region would operate similarly and potentially result in an overall significant cumulative impact. Therefore, this would be a ***potentially significant cumulative impact***.

Mitigation Measures

Mitigation Measure 7.1-2 includes modeling and a process for identifying and mitigating for adverse significant impacts on nearby wells. It builds on existing agreements in the area, as well as additional mitigation measures (See Chapter 7, Impact 7.1-2 and Mitigation Measure 7.1-2).

Continued well monitoring and implementation of existing agreements regarding KWB operations offer the most feasible and pragmatic approach to mitigation (i.e., the 1995 KWB MOU, see Appendix 7-5a; and the 2014 Interim Operations Plan, see Appendix 7-5b). Rosedale has also adopted a long-term operations plan to prevent, eliminate, or mitigate potential impacts from its projects. Rosedale's plan is part of its Stockdale Integrated Banking Project Final EIR dated November 2015. KWBA has adopted the 2016 Long-Term Project Recovery Operations Plan (see Appendix 7-5c) that prevents, eliminates, or mitigates potential impacts from the KWB. It is possible that a joint long-term agreement will be developed in the near future between KWBA, Rosedale, and the Pioneer Project for the coordinated implementation of a long-term banking operations plan that includes standards that address potential cumulative impacts of the participating banks. Mitigation Measure 7.1-2 therefore builds on these existing and proposed agreements.

Implementation of the following mitigation measure would reduce the KWB's cumulatively considerable incremental contribution to the significant cumulative impact of a substantial depletion of groundwater supplies, or of substantial interference with groundwater recharge, to a *less-than-considerable* level. Therefore, this impact would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-24 *KWBA will implement Mitigation Measure 7.1-2.*

10.1-25 **Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts related to the alteration of water levels in a groundwater basin that substantially affect existing infrastructure (e.g., conveyance facilities).**

Future recharge operations at the KWB could result in high groundwater elevations within KWB Lands and nearby lands. Historic recharge operations at the KWB during the past recharge periods of 1995-1998, 2005-2006, and 2011, concomitant with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations within KWB Lands and surrounding areas. Approximately 7 miles of the CVC are located within KWB Lands, and past high groundwater elevations resulted in damages to the CVC lining in the mid-1990s. KWB operations could interact with similar nearby groundwater banks on specific sections of the CVC to cause a cumulatively considerable incremental contribution to a significant cumulative impact. As summarized in Impact 7.1-7 discussion in Section 7.1, KWB operations under AFO-BC scenario conditions during periods of KWB recharge could cause groundwater levels to increase. High groundwater resulting from natural conditions, offsite recharging, or recharging on the KWB Lands could impact the integrity of CVC structures or cause cracks in sub-surface concrete panels. Therefore, KWB activities could make a cumulatively considerable incremental contribution to a significant cumulative impact on the CVC. Therefore, this impact would be a ***significant cumulative impact***.

Mitigation Measures

Mitigation Measure 7.1-7 would reduce impacts of KWB activities with regard to cumulative impacts on existing infrastructure to less than significant. KWBA is obligated to carry out the measures relating to its actions. Therefore, this impact would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-25 *KWBA will implement Mitigation Measure 7.1-7.*

10.1-26 **Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts related to the alteration of water levels in a groundwater basin that substantially affect existing infrastructure (e.g., residential septic systems).**

Future recharge operations at the KWB could result in high groundwater elevations within KWB Lands and nearby lands. Historic recharge operations at the KWB during the past recharge periods of 1995-1998, 2005-2006, and 2011, concomitant with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations within KWB Lands and surrounding areas. The analysis for Impact 7.1-8 in Section 7.1 showed that there is no adverse impact to residential septic systems from KWB activities. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-27 **Raise water levels in a groundwater basin sufficiently to substantially interfere with groundwater recharge.**

Historic recharge operations at the KWB during the recharge periods of 1995-1998, 2005-2006, and 2011, in conjunction with similar recharge operations at other neighboring groundwater banks, resulted in high groundwater elevations in KWB and surrounding areas. High groundwater elevations could potentially effect recharge operations at neighboring recharge facilities, such as Rosedale recharge basins north of KWB, Pioneer and 2800 Acre Recharge Project facilities east of KWB, and West Kern Water District recharge facilities south of KWB.

During recharge operations groundwater levels rise. The rise in water tables would be the result of the mutual interactions of the KWB and the neighboring groundwater banks and not due to the operation of any single groundwater bank. Impacts of KWB recharge operations on the recharge operations of neighboring recharge facilities were evaluated by using water level hydrographs at the neighboring recharge facilities. The evaluation showed a resulting groundwater level of approximately 16 feet below the ground surface. This would not result in a significant interference with groundwater recharge.

Therefore, the impact of KWB future operations under build-out conditions from 2015 to 2035 on groundwater supplies, such that groundwater recharge would be substantially interfered with, would be less than significant and would not make a cumulatively considerable incremental contribution to a significant cumulative impact. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.2 Surface Water and Groundwater Quality

Section 7.2, Surface and Groundwater Quality, describes the methodology used to quantify cumulative impacts. The geographic extent of the water quality analysis for the underlying groundwater aquifer extended beyond KWB Lands using the DWR KWB Model to the following boundaries: northern edge, 6 miles; southern edge, 5.2 miles; eastern edge, 10 miles; and western edge, 7.7 miles. The greatest cumulative impacts would be closest to KWB Lands. The analysis of impacts on local surface water

quality includes the Kern River and associated channels and interties, and the following primary surface water conveyance facilities: California Aqueduct, CVC, and the KWB Canal (see Figures 7.2-1 and 7.2-2 in Section 7.2). Because of the length of Section 7.2, and its coverage of cumulative impacts, this section presents a qualitative analysis that is based on the quantitative analysis in Section 7.2.

10.1-28 Implementation of KWB activities in combination with regional and local water banking projects could potentially change groundwater quality from construction and maintenance activities.

Construction and maintenance activities would be subject to Best Management Practices (BMPs), Central Valley Regional Water Quality Control Board (CVRWQCB) authorization and permit requirements under National Pollutant Discharge Elimination System (NPDES) permits, and Article 14.08 of the Kern County Ordinance Code (specifically Article III Well Standards). Department Bulletins 74-81 and 74-90 provide specific State-issued minimum standards for well construction and well destruction, while the local city and county provide enforcement. Water well permits would be regulated by the Kern County Environmental Health Services (KCEHS) Water Program (See Section 7.0.4.1.6) under which new wells and well deepening, reconstruction, and destruction would be subject to permits requiring compliance. Drilling operations would follow grading permits (if needed) and well permit regulations in accordance to general conditions stipulated in KCEHS water well permit applications.

However, all infrastructure requires construction and maintenance, including the numerous production wells and monitoring wells on KWB Lands. Rehabilitation necessary to maintain the yield of production wells generally consists of the addition of chemicals to breakdown slime or iron bacteria mass or encrustation that reduce the size of the well perforations. KWB operations and maintenance activities in combination with KWBA's proposed Kern Water Bank Recharge and Recovery Project, KWB Conservation and Storage Project, and other similar nearby groundwater banks, could make a cumulatively considerable incremental contribution to a significant cumulative impact on groundwater quality. This impact would be a **potentially significant cumulative impact**.

Mitigation Measures

Mitigation Measure 7.2-1 would reduce impacts of KWB activities with regard to potential changes to groundwater quality to less than significant. KWBA is also subject to legal requirements regarding activities related to well drilling. Therefore, KWB activities with regard to potentially changing groundwater quality from KWB construction and maintenance activities would be a **less-than-significant cumulative impact, with mitigation**.

10.1-28 *KWBA will implement Mitigation Measure 7.2-1.*

10.1-29 Implementation of KWB activities in combination with regional and local water banking projects could potentially degrade groundwater quality from mobilization of contamination associated with hazardous waste sites or oil and gas production operations.

KWB operations under cumulative conditions would only result in groundwater levels that could rise above 50 feet and 25 feet below ground surface for limited periods of time with the potential to mobilize some constituents of concern (COCs). Particle tracking results indicate that groundwater particles (and COCs, if present and mobilized) would remain within a mile of the two sites of concern (the Uhler Firefighting Training Facility and the Grayson Site). Both sites are under CVRWQCB oversight with remediation of impacted soil considered complete (February 2012) and groundwater monitoring continuing at the Uhler Firefighting Training Facility and work just starting to be implemented under a CAO (issued August 15, 2015) at the Grayson Site respective to soil and groundwater contamination

associated with three onsite oil field production wastewater holding ponds. Therefore, the impact of KWB operations in relation to the two sites on groundwater quality would be a cumulatively considerable incremental contribution to this potentially significant cumulative impact until such time that the CVRWQCB indicates that groundwater under the Uhler Firefighting Training area is not impacted and that soil and/or groundwater under the Grayson Site is not impacted. This would be a ***potentially significant cumulative impact***.

Mitigation Measures

Mitigation Measure 7.2-2 would reduce impacts of KWB activities with regard to mobilization of contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations to less than significant. KWBA is obligated to carry out the measures relating to its actions in Mitigation Measure 7.2-2, subsections b-d (Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, with Mitigation Measure 7.2-2, KWB activities would not make a cumulatively considerable incremental contribution to a significant cumulative impact with respect to potentially degrading groundwater quality from mobilization of contamination associated with hazardous waste sites or oil and gas production operations. This impact would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-29 *KWBA will implement Mitigation Measures 7.2-2.*

10.1-30 **Implementation of KWB activities in combination with regional and local water banking projects could potentially have their water quality degraded from the operation of oil and gas production wells on KWB Lands and nearby.**

KWB Lands are situated across four active oil and gas fields: Coles Levee, North; Strand Oil Field; Ten Section Oil Field; and Canal Oil Field. While these wells are situated on KWB Lands, they are not operated or associated with KWBA. KWB operation in combination with KWBA's proposed projects and other proposed nearby banking projects in the areas of other oil and gas production wells would represent a potentially significant impact to groundwater quality if new recharge ponds were constructed in areas of improperly plugged or abandoned oil and gas wells. Likewise, well casing failures during oil and gas production, wastewater injection, and/or well stimulation could cause a release of petroleum constituents, oil field brines, and/or well stimulation fluid into the freshwater aquifer, which may substantially degrade groundwater quality. Therefore, the cumulative impacts of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies during 2015 to 2035 could be a ***potentially significant cumulative impact***.

Mitigation Measures

Mitigation Measure 7.2-3 would reduce potential impacts of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies in the future to less than significant. Therefore, the impact of the operation of oil and gas production wells within and surrounding KWB Lands on the quality of KWB water supplies in the future would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-30 *KWBA will implement Mitigation Measure 7.2-3.*

10.1-31 **KWB construction and maintenance activities could potentially change groundwater quality.**

Ongoing future facility maintenance and well rehabilitation or construction would occur as it has in the past for the 1996 through 2014 period. Impacts from KWB construction and maintenance activities from

2015 to 2035 on groundwater quality would be potentially significant. However, KWB construction and maintenance activities would be site specific on KWB Lands. These localized impacts were not cumulatively significant from 1996 through 2014 and would not be in the future because these potential impacts would not interact with similar impacts from other probable future projects. Therefore, KWB activities would not make a cumulatively considerable incremental contribution to a significant cumulative impact regarding changes to groundwater quality from construction and maintenance activities. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-32 KWB operations could mobilize contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production operations and potentially degrade groundwater quality.

As summarized for Impact 7.2-2 in Section 7.2, KWB operations under AFO-BC would only result in groundwater levels that could rise above 50 ft and 25 ft below ground surface (bgs) for limited periods of time with the potential to mobilize some COCs. Particle tracking results indicate that groundwater particles (and COCs, if present and mobilized) would remain within a mile of the two sites of concern (the Uhler Firefighting Training Facility (OP 1), and the Grayson Site (OP 2)). Both sites are under CVRWQCB oversight with remediation of impacted soil considered complete (February 2012) and groundwater monitoring continuing at the Uhler Firefighting Training Facility and work just starting to be implemented under a CAO (issued August 15, 2015) at the Grayson Site respective to soil and groundwater contamination associated with three onsite oil field production wastewater holding ponds. These two sites are localized on KWB Lands and are being remediated. These localized impacts were not cumulatively significant from 1996 through 2014 and would not be in the future because these potential impacts would not interact with similar impacts from other probable future projects. Therefore, KWB activities would not make a cumulatively considerable incremental contribution to a significant cumulative impact regarding degradation of groundwater quality from mobilization of contamination in soils or the unsaturated zones associated with hazardous waste sites or oil and gas production. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-33 The operation of oil and gas production wells within and surrounding KWB Lands could potentially degrade the quality of KWB water supplies.

As specified for Impact 7.2-3 in Section 7.2, future KWB recharge and recovery operations would be similar to 1996 through 2014 activities; however, recharge and recovery operations would be increased slightly with the addition of new facilities. Third party oil and gas production, wastewater injection, and well stimulation activities within and surrounding KWB Lands are expected to continue in 2015 through 2035 in the same manner as during 1996 through 2014.

Future recharge ponds are proposed in areas of plugged and abandoned oil production wells. Typical construction of oil wells includes an upper casing and cement seal from ground surface to a depth of approximately 500 feet. Groundwater level changes during recharge or recovery from KWB operations have maximum depths of approximately 250 feet. Changing water levels from KWB activities would not significantly impact active or abandoned oil wells.

Construction of recharge ponds may potentially damage the near surface portion or the top of plugged or abandoned wells and well casing failures during oil and gas production, wastewater injection, and/or well stimulation could cause a release of petroleum constituents, oil field brines, and/or well stimulation fluid into the freshwater aquifer, which may substantially degrade groundwater quality. These are potential site-specific impacts on KWB Lands that would not likely interact with other nearby groundwater banks, and are not known to have done so in the last 20 years of KWB operations. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-34 Implementation of KWB activities in combination with regional and local water banking projects could result in changes in water quality in the underlying aquifer as a result of lateral and vertical migration of poor water quality within and outside the limits of the KWB.

As specified in Impact 7.2-4 in Section 7.2, evaluation results indicate that KWB recharge and recovery operations in combination with KWBA's proposed projects, and potentially other nearby groundwater banks could change water quality in response to mixing with recharge water (predominantly in the shallower zone with successive movement to the deeper zones). The mixing is associated with both lateral and vertical movement of existing and mixed groundwater. As recharge and recovery operations continue, groundwater migrates outward during times of recharge and inward during times of recovery. This would result in a mixing of groundwater in the KWB and surrounding area. Water used for recharge in KWB is from three surface water sources: SWP water in the California Aqueduct, Friant-Kern Canal water, and Kern River water. These surface water sources are of a higher quality than the existing groundwater present in KWB. Therefore, KWB activities would not result in a cumulatively considerable incremental contribution to this potentially significant cumulative impact related to changes in water quality in the underlying aquifer as a result of lateral and vertical migration of poor water quality. This would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-35 Implementation of KWB activities in combination with regional and local water banking projects could result changes in water quality in the underlying aquifer as a result of an accumulation of salts during recharge activities.

As specified in Impact 7.2-5 in Section 7.2, TDS concentrations in imported and local water supplies used for KWB recharge operations can vary year to year and among sources. Water delivered to the KWB has TDS concentrations that vary by source. The variation in TDS concentrations in a given year is primarily a result of the amount of precipitation, and volumes of agricultural return flows, stormwater runoff, and municipal discharges. During recharge periods in above normal and wet water years, the average TDS concentrations tend to be lower because there is more water within the system that dilutes the effects of salt loading from various sources.

It is expected the under cumulative conditions more salt would be removed from the aquifer below the KWB than is being recharged. The difference between the salt recharge and recovery volume in tons/acre foot indicate a lowering of salt content in the aquifer below KWB. This indicates that California Aqueduct water quality and groundwater quality beneath KWB have both been improved by operations of KWB with respect to TDS. Therefore, KWB activities would not result in a cumulatively considerable

incremental contribution to this potentially significant cumulative impact with respect to accumulation of salts during recharge activities. This would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-36 Implementation of KWB activities in combination with regional and local water banking projects could result in a cumulatively considerable impact on water quality in the Kern River.

As specified in Impact 7.2-6 in Section 7.2, future construction of additional facilities associated with the build-out of the KWB has the potential to significantly impact surface water quality from excavation, grading, and recontouring of the soils at the recharge pond sites. Although there are no assurances that the cumulative projects would incorporate the same degree or methods of treatment as the project, each cumulative project that would discharge stormwater runoff would be required to comply with applicable regulatory requirements, including those of the NPDES General Construction Permit, which requires preparation of a project-specific Stormwater Pollution Prevention Plan (SWPPP) and implementation of BMPs, the potential for pollutants and sediment to adversely affect the water quality of adjacent water bodies would be minimized.

During construction and maintenance activities spills of equipment fuel, lubrication oil, and hydraulic oil could occur. Petroleum hydrocarbon products and other construction-related materials, as well as any hazardous materials, would be stored, handled, and used, although in relatively small quantities, during construction and maintenance. The potential release of hazardous materials to the environment as a result of construction or maintenance activities could also result in the degradation of water bodies, affecting water quality. Hazards and Hazardous Materials presents an analysis of the potential release of hazardous materials during construction and maintenance. However, these would be localized impacts and the probability of interacting with similar spills from other water banking projects such that the impacts would interact is highly unlikely. Therefore, KWB activities would not result in a cumulatively considerable incremental contribution to this potentially significant cumulative impact with respect to potential impacts on Kern River water quality. This would be a ***less-than-significant cumulative impact***.

10.1-37 Implementation of KWB activities in combination with regional and local water banking projects could result adverse impacts associated with water quality in surface water conveyance facilities and associated water supplies for downstream users.

As specified in Impact 7.2-7 in Section 7.2, KWBA has also applied for a water right to divert unappropriated water from the Kern River, which is the estimated maximum quantity that KWBA can physically divert and recharge at the KWB in the wettest years (KWB Conservation and Storage Project). The quantity of water available for diversion to the KWB would depend on annual and seasonal hydrologic and climatologic conditions. Appropriation of water under this application would also supplement and permit water historically diverted from the Kern River to the KWB in above-normal or wet water years.

Future projects may result in additional water diverted, recharged, and recovered at KWB, although primarily during wetter years. Water diversions from the Kern River under future operations, however, would be similar in quantity and timing as current operations, although some additional water may be available in the wettest of years, when water quality is generally improved. Future diversions from the

Kern River are not anticipated to reduce water quality in the Kern River downstream from the point of diversion.

During recovery operations, groundwater would be introduced into the CVC and the California Aqueduct and would be subject to the pump-in water quality requirements by KCWA and the Department. Recovered groundwater pumped into the CVC and California Aqueduct would be monitored. It is the intent to meet Pump-in Policy water quality objectives. The KWBA, with assistance from the KFMC, will continue to monitor water quality at production wells and continue blending efforts to ensure that MCLs, pump-in criteria, or SWP WQOs are not exceeded.

Potential impacts from future operations to water quality in the Kern River, California Aqueduct, and local conveyance systems should be similar to historical conditions, given the continuation of the current pump-in policies and water quality monitoring program. KWB operations, therefore, would not make a cumulatively considerable incremental contribution to a significant cumulative impact associated with water quality in local conveyance facilities and water supplies for downstream users. This would be ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.3 Fisheries Resources

The cumulative context for fisheries resources consists of cumulative water banking projects adjacent to the Kern-Friant Canal and those adjacent to the Kern River in Kern County.

10.1-38 Implementation of KWB activities in combination with regional and local water banking projects in Kern County could potentially result in cumulatively considerable impacts on fish species of special concern through entrainment.

Kern brook lamprey is endemic to the east side of the San Joaquin Valley and is listed as a California species of high concern. Kern brook lamprey were first collected from the Friant-Kern Canal but have since been found in the lower Merced, Kaweah, Kings, and San Joaquin Rivers. The species is not known to occur in the Kern River and would be unable to maintain a self-sustaining population or survive long-term in the Kern River in the KWB area. Kern brook lamprey has been detected in the Friant-Kern Canal, and it is possible, although highly unlikely, for individuals of the species to be present in the canals directly delivering water to the KWB. Breeding habitat does not exist in the canals; any entrained lampreys would not spawn and would die. None of the cumulative projects would increase the potential for Kern brook lamprey to be exposed to KWB activities. KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on Kern brook lamprey.

KWB activities would continue to have the rare potential to cause entrainment of Kern River rainbow trout that reach KWB Lands. Populations of Kern River rainbow trout are currently restricted to reaches of the Kern River above Lake Isabella. The likelihood of this species being transported down the Kern River during flood flows and being entrained into the KWB or other water banks located along the Kern River (such as West Kern WD or City of Bakersfield), is extremely low. Trout would not be able to survive in the Kern River or in water bodies on KWB Lands. None of the cumulative projects would combine cumulatively with KWB activities to increase impacts to Kern River rainbow trout.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on Kern brook lamprey or Kern River rainbow trout. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.4 Terrestrial Biological Resources

The cumulative context for terrestrial biological resources consists of water banking and HCP projects in the local area and region.

10.1-39 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts on special-status terrestrial biological resources.

As discussed in Section 7.4, Terrestrial Biological Resources, KWBA manages KWB Lands in accordance with a KWB HCP/NCCP. Thus, KWBA is required to follow specific guidelines to prevent take of special-status species and to enhance and preserve the natural habitat currently present. Under the conditions of the KWB HCP/NCCP, KWBA is required to prepare annual reports summarizing activities within KWB Lands, including:

- updates on the water supply management and related activities,
- any amendments to the KWB HCP/NCCP,
- a summary of any take occurrences,
- land and habitat management and mitigation measures,
- monitoring programs and studies,
- mitigation measures and cooperation with wildlife agencies, and
- the status of conservation credits.

An independent study regarding the impacts related to the transfer, development, and operation of the KWB in light of the Kern Environmental Permits documented that the KWB is operating as intended and within the confines of the KWB HCP/NCCP (see Revised Appendix E). The KWB HCP/NCCP requires that KWB activities continue to follow the KWB HCP/NCCP requirements for 75 years from 1997.

Periodic recovery operations result in the intermittent wetting and drying of recharge ponds. This mimics the natural pattern for seasonal wetlands. As discussed above, this is to be expected and fully within the operating parameters set by the KWB HCP/NCCP.

While minimal incidental take has occurred since the creation of the KWB (temporary relocation of three live Tipton Kangaroo rats in 1995/1996), it is possible that KWB activities could result in take during construction, operation, and maintenance, through collapsed burrows, road kills, crushing by grading equipment, harassment, habitat loss, drowning, and other adverse effects. Special-status plants could also be adversely affected during future KWB construction of new facilities and continued operation and maintenance.

Cumulative water banking projects could result in similar impacts on special-status species with the construction of additional groundwater storage facilities. KWB activities could result in a cumulatively considerable incremental contribution to this potentially significant cumulative impact on special-status species. Therefore, this impact would be a ***potentially significant cumulative impact***.

Mitigation Measures

Mitigation Measure 7.4-3 was outlined in the 1997 Monterey Initial Study and Addendum (Appendix 7-6a). Mitigation Measure 7.4-3 has been and will continue to be implemented by KWBA. Mitigation Measure 7.4-3 would reduce impacts on special-status species on KWB Lands to a less-than-considerable level by requiring the use of a biological monitor, and implementing special construction activities and ongoing practices that would increase awareness of and education regarding sensitive biological resources. Specific individuals would be designated by KWBA as contact representatives between KWBA, USFWS, and the California Department of Fish and Wildlife to oversee compliance with protection measures and expedite notification regarding any take of a listed species.

Implementation of the following mitigation measure would reduce the KWB activities' incremental contribution to the potentially significant cumulative impacts associated with special-status biological resources on KWB Lands to a less-than-considerable level; KWBA is obligated to carry out this mitigation measure. Therefore, this impact would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-39 *KWBA will implement Mitigation Measure 7.4-3.*

10.1-40 **Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on special-status terrestrial biological resources as a result of potential changes in agricultural practices.**

Although the value of agricultural land to wildlife is generally lower than that of natural habitat, some species have adapted and have extended their range into converted agricultural habitats. Rodents such as voles and ground squirrels, for example, can take advantage of increased food availability and water supply on agricultural lands to increase their populations, which in turn can provide a larger prey base for predators such as raptors. Grain and row crops (and the insects that feed on them) can support bird and mammal populations that otherwise would be constrained by the absence of such food resources in more xeric habitats. Conversely, increased levels of human activity, the plowing and tilling of soils, and the application of fertilizers, pesticides, and herbicides to stimulate agricultural production can adversely affect native wildlife, resulting in displacement or avoidance.

Some animals have adapted to exploit cultivated fields (in some cases becoming pests), but few special-status species benefit from agricultural cultivation. San Joaquin kit fox are able to use the habitat for migration, but no longer can den. Swainson's hawks (*Buteo swainsoni*), however, commonly rely on the increased insect and rodent populations in agricultural fields within 10 miles of their nests, actually preferring to forage in alfalfa, beet, tomato, rice (during the nonflooded period), cereal grain (including corn after harvest), and other low-growing, row, or field crops; fallow fields; and dry and irrigated pasture. Although only one Swainson's hawk nest has been recorded in the western portion of Kern County, it is highly unlikely that this nest would remain active if all of the surrounding farmland were converted from annual crops to permanent crops.

As discussed in Section 7.6, Agricultural Resources, KWB activities have had a relatively minor effect on the conversion of agricultural land uses to nonagricultural uses. Overall, the KWB provides recovery

water for agricultural uses at times when less water would be available without the KWB. Consequently, the KWB has helped maintain agricultural lands in agricultural production.

The USFWS and the California Department of Fish and Game approved the KWB HCP/NCCP in October 1997. The KWB HCP/NCCP planning area comprises the entire approximately 20,000-acre KWB Lands. KWB activities resulted in the reestablishment and preservation of intermittent wetland and upland habitat, both of which existed historically throughout much of the southwestern San Joaquin Valley. About 17,000 of the approximately 20,000 acres that compose the KWB Lands were farmed intensively before 1991. Now, the water conservation activities of the KWB are re-creating intermittent wetland habitat in/along the recharge ponds, where marsh-like environments are established during recharge periods and create ideal habitat for waterfowl, shorebirds, raptors, and other native and migrating birds. By expanding available habitat for numerous species, recharge operations have result in nearly doubling the number of special-status species that have been documented to occur on KWB Lands (see Tables 7.4-2A and 7.4-4).

Further, KWB activities expanded and protected riparian and other sensitive habitats, such as native saltbush and valley sink scrub habitat, on KWB Lands. On a limited basis, KWBA has planted various plant species based on the KWB HCP/NCCP. Cottonwoods, willows, and grasses are examples of species that are not planted but contribute to wildlife habitat. KWB development also resulted in the conversion of intensively farmed lands to annual grassland habitat that supports numerous plant and wildlife species. Therefore, on KWB Lands, KWB activities have had a beneficial effect on terrestrial biological resources. KWB activities do not have a cumulatively considerable incremental contribution to a significant cumulative impact on terrestrial biological species.

Impacts from KWB activities that provide water to KWB participants could also have a cumulative effect on terrestrial biological resources. Based on the historical trend of converting annual row crops to permanent crops in Kern and the KWB participants' service area, it is possible that KWB activities in combination with other water banking programs and projects could result in the conversion of additional annual row crops to permanent crops.

Some shifts in species distribution and abundance have and would continue to occur in the future with or without KWB activities. This cropping pattern shift, however, is primarily converting agricultural lands from annual row crops to permanent crops such as orchards; natural habitats generally are not being converted to agricultural lands. Past impacts of converting natural habitats to urban and agricultural lands in Kern and Kings Counties have resulted in a significant cumulative impact to many terrestrial biological resources, particularly special-status species.

Orchards provide lower quality habitat than row crops due to increased cover, pesticide/herbicide applications, and frequent disturbance. To the extent that some land was converted to orchards as a result of KWB activities, this would not prohibit San Joaquin kit fox migration, but could adversely impact Swainson's hawk, as this habitat is not suitable for foraging. However, there is only one recorded occurrence of Swainson's hawk within KWB Lands. As discussed in Section 7.6, Agricultural Resources, no change in the proportion of permanent crops occurred in the KWB participants' service area as a result of KWB activities.

KWB activities have not and would not result in a cumulatively considerable incremental contribution to this significant cumulative impact on special-status terrestrial biological resources as a result of potential changes in agricultural practices. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.5 Visual Resources

The cumulative context for visual resources consists of cumulative water banking projects in the Kern Fan area and other nearby development projects.

10.1-41 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on visual resources.

As a consequence of future KWB activities, approximately 1,052 acres of additional lands would be converted to recharge ponds. Although these changes would alter the appearance of lands within KWB Lands, the alteration in appearance would be minimally visible, consistent with other water facility features common in the local area and region. Other existing and proposed water banks would have similar facilities. Development projects are distant from KWB Lands and would not overlap visually with KWB activities. KWB activities would also not contribute to skyglow and any cumulative impacts thereof as KWB lands are mostly open lands with limited lighting at a few facilities. Given the relatively unobtrusive nature of groundwater bank facilities in the local area and region, the overall cumulative impact to visual resources from past, present, and probable future groundwater banking projects, including the KWB, is less than significant. Moreover, the KWB facilities and activities would not cause a cumulatively considerable incremental contribution to a significant cumulative impact on visual resources.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on visual resources. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-42 Implementation of KWB activities in combination with regional and local water banking and other water supply projects could potentially result in cumulatively considerable impacts on visual resources as a result of potential changes in agricultural practices.

KWB activities have increased water supply reliability, which may have contributed along with other water banking projects and regional economic conditions in changes from seed, field and vegetable crops on land that could be fallowed in dry/critically dry years to permanent crops like orchards and vines that require a dedicated water supply. Water banking projects locally and in the region that contribute to the availability and reliability of water supplies would likely continue to contribute to the existing trend towards permanent crops. Although existing agricultural acreages remain generally constant, the changes in cropping patterns could alter the appearance of the landscape. Permanent crops are generally taller and provide more visual variety than annual crops. Permanent crops break up the uninterrupted views across miles of flat land in the southern San Joaquin Valley.

Based on the historical trend of converting annual seed, field, and vegetable crops to permanent crops such as orchards and vines in Kern County and the KWB participants' service area, it is possible that

KWB activities in combination with cumulative water banking and other water supply projects have contributed to the conversion of annual crops to permanent tree and vineyard crops. This trend would have occurred with or without the KWB and is expected to continue in the future with or without KWB activities. Any shifts to permanent crops attributed to KWB activities and other water banking/water supply projects would result in views similar to existing views of permanent crops throughout the local area and region. Although the physical changes are noticeable in Kern County and the KWB participants' service area, the changes from seed, field and vegetable crops to orchards and vineyard are not considered to be a significant cumulative impact on visual resources. Each type of agricultural land has its attributes that different people find to be visually appealing, or not. The physical change from one crop to another, therefore, is not considered to be a significant cumulative impact.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on visual resources as a result of potential changes in agricultural practices. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.6 Agricultural Resources

The cumulative context for agricultural resources, including forestry resources, consists of Kern County and the KWB participants' service area. There are no impacts to forestry resources so they are not discussed further.

10.1-43 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in the conversion of agricultural lands, including Important Farmland, to nonagricultural uses.

The California Department of Conservation (DOC) estimated that Kern County had approximately 2,743,937 acres of agricultural land in 2012 (the most recent DOC farmland conversion data), of which approximately 900,332 acres were identified as Important Farmland and 1,843,605 acres were identified as Grazing Land.¹² Overall, the total acreage of Important Farmland decreased by approximately 7.4 percent between 2004 and 2012, and the total acreage of Grazing Land increased by 2.9 percent over the 8-year period. In total, the acreage of agricultural land decreased by approximately 0.5 percent between 2004 and 2012 (see Table 7.6-7 in Section 7.6, Agricultural Resources). The general trends in harvested agricultural lands in the Kern County and the KWB Participants' service area from 1995 to 2014 were slight increases in these acreages (see Tables 7.6-5 and 7.6-6 in Section 7.6, Agricultural Resources).

Future implementation of cumulative groundwater banking and development projects could convert Important Farmland to nonagricultural uses. Appendix G of the CEQA Guidelines focuses agricultural analysis on conversion of agricultural land, including Important Farmland, to nonagricultural uses; therefore, any conversion of these lands could be considered a significant impact under CEQA. The losses of agricultural resources, including Important Farmland (Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) that have occurred locally and regionally from past water banking and development projects—and that would continue as a result of present and planned projects—are considered to be a significant cumulative impact on conversion of agricultural lands, including Important Farmland, to nonagricultural uses.

The Kern County Important Farmland Map, published by DOC's Division of Land Resource Protection, identifies approximately 15,390 acres of KWB Lands that are designated as Grazing Land, 9 acres

designated as Urban and Built-Up Land, and 5,035 acres designated as Other Land. These land use designations are not considered Important Farmland by DOC. In addition, the portions of KWB Lands that do not support KWBA facilities remain fallow.

KWB activities would not make a cumulatively considerable incremental contribution to the significant cumulative impact associated with the conversion of agricultural land, including Important Farmland, to nonagricultural use. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-44 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in the conversion of annual crops to permanent crops.

As discussed in Section 7.6, Agricultural Resources, although there was a relatively small increase in harvested agricultural acreage in Kern County (approximately 1.2 percent) between 1996 and 2014, the county's cropping patterns changed substantially. As shown in Table 7.6-4 in Section 7.6, the acreage of nut crops increased by approximately 206 percent and almonds accounted for more than 65 percent of the total nut crops. The acreages of annual seed, field, and vegetable crops all decreased between 1995 and 2014.

As evidenced by Kern County and the KWB participants' service area, analysis in Section 7.6, changes in farming practices in these areas are consistent with the county-wide trend discussed above (Table 7.6-6). The acreage of nut crops increased by approximately 206 percent and almonds accounted for more than 60 percent of the total nut crops in 2015. This shift to permanent crops such as orchards and vineyards is also seen in areas that do not rely on groundwater banking.

KWB activities have increased water supply reliability, which may have contributed to changes from annual seed, field, and vegetable crops, on land that could be fallowed in dry/critically dry years, to permanent crops like orchards and vines that require a dedicated water supply. All water banking projects in the local area and region that contribute to the availability and reliability of water supplies could continue to contribute to the existing trend (which occurs even in areas not dependent upon water banks) toward shifting to permanent crops. However, local, regional, and even global economics also contribute substantially to this recent shift to permanent crops. The trend of shifting to permanent crops may continue in the future with or without KWB activities and cumulative water banking projects because such shifts are typically driven by crop production, supply, and demand; profit margins; and regional and global economics; as has been the case with California's almond industry, a leading crop type within Kern County and the KWB participants' service area (see Section 7.6 Agricultural Resources, subsection 7.6.2.2).¹³

KWB activities and other water banking projects could also result in the conversion of additional agricultural lands to permanent crops, such as orchards and vines, in the future as more projects are developed or expanded to increase water supply reliability. Based on the countywide trend discussed above, which is prevalent in adjoining counties in the southern San Joaquin Valley, it is likely that the trend of replacing annual seed, field, and vegetable crops with permanent crops in the local area and region could continue in the near future. Consequently, KWB activities could make a cumulatively considerable incremental contribution to this shift to permanent crops, at least during current economic conditions (always a critical factor driving agricultural cropping patterns).

The conversion of annual crops to permanent crops such as orchards and vines does not exceed any of the Appendix G standards of significance in the CEQA Guidelines related to agriculture and forestry resources. For instance, no agricultural lands, including Important Farmland, would be converted to nonagricultural uses, and such lands would remain in production. A shift in crop patterns, in and of itself, is not a significant adverse environmental impact.

The KWB's contribution to conversion of irrigated crops to permanent crops does not result in an overall significant adverse impact relative to any of the standards of impact significance for agriculture and forestry resources. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Other indirect cumulative effects from conversion of irrigated crops to permanent crops, such as those associated with biological resources, visual resources, air quality, soils, noise, traffic and transportation, and cultural and paleontological resources, could occur. The cumulative effects on these resource areas of changes from irrigated crops and annual field crops to permanent crops such as orchards are discussed separately in this cumulative impacts analysis for each potentially affected resource area.

Mitigation Measures

None required.

10.1.5.7 Air Quality

The cumulative context for air quality is the San Joaquin Valley Air Pollution Control District (SJVAPCD). The San Joaquin Valley Air Basin is designated as nonattainment for the state standards for ozone and particulate matter with an aerodynamic resistance diameter less than 10 micrometers (PM₁₀) and 2.5 micrometers (PM_{2.5}). Although most projects would result in a net increase in air pollutant emissions, the impacts in this REIR evaluate whether that net increase in emissions would be considered a cumulatively considerable incremental contribution to a significant cumulative impact on air quality. According to SJVAPCD, projects that would generate air pollutant emissions exceeding applicable thresholds of significance would generate emissions above the allowable limit for the region to attain and maintain ambient air quality standards, and the contribution of such emissions would be cumulatively considerable.¹⁴

A quantitative discussion of cumulative air quality impacts is provided in Section 7.7, Air Quality. The following discussion briefly summarizes those impacts.

10.1-45 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially generate cumulatively considerable air pollutant emissions that would violate air quality standards.

As discussed in Impacts 7.7-3, 7.7-9, and 7.7-10 of Section 7.7, KWB activities would not result in emissions of any air pollutants exceeding SJVAPCD thresholds of significance.

Construction emissions from proposed future KWB projects would not exceed SJVAPCD thresholds of significance (see Table 7.7-3 in Section 7.7). Operations and maintenance (O&M) activities associated with KWB activities are not expected to increase beyond the levels shown in Table 7.7-4 which do not exceed SJVAPCD thresholds of significance.

Thus, it is not anticipated that future KWB construction or O&M activities would result in a cumulatively considerable net increase in emissions toward the significant cumulative impact on local and regional air quality. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

- 10.1-46 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable exposure of sensitive receptors to substantial pollutant concentrations.**

Construction

Construction activities would generate short-term emissions of diesel particulate matter (PM) from the exhaust of off-road heavy-duty diesel equipment for earth-disturbing activities and diesel-fueled truck trips. Construction activities for KWB activities and proposed projects are anticipated to occur for approximately 6–8 months, or approximately 2% of the minimum exposure period required to complete a health risk assessment. The past completed KWB activities and probable future KWB activities would not occur within 1,000 feet of sensitive receptors.

Considering the intermittent and temporary construction emissions and the buffer distance from sensitive receptors, it is highly unlikely that construction activities associated with KWB activities, including its proposed projects, would expose sensitive receptors to substantial TAC concentrations. Since few sensitive receptors are near KWB Lands, it is not expected that other cumulative water banking and development projects would overlap with construction impacts from KWB future projects.

Construction-related toxic air contaminants (TAC) emissions associated with KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact regarding the exposure of sensitive receptors to substantial pollutant concentrations. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

Operations and Maintenance

As discussed in Impact 7.7-9 of Section 7.7, following construction of KWB facilities in combination with the planned Integrated Regional Water Management (IRWM) Plan (Kern Water Bank Recharge and Recovery Project) and full build-out projects, it is not anticipated that KWB O&M activities would substantially increase beyond existing levels. Such activities would continue to occur intermittently across KWB Lands and would be of relatively low intensity with respect to TAC emissions.

It is not anticipated that future KWB O&M activities would expose sensitive receptors to a cumulatively considerable incremental contribution to a significant net increase in TAC emissions. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

- 10.1-47 Construction, operations, and maintenance of the existing and proposed KWB facilities with other cumulative projects could potentially generate objectionable odors in a cumulative manner affecting a substantial number of people.**

As discussed in Section 7.7, construction activities associated with future KWB activities would occur intermittently throughout their 6- to 8-month construction schedules. However, construction-related odor emissions would occur during the day and cease at night. Therefore, construction-related odors would not be constantly generated from the construction site. In addition, construction equipment would be used intermittently, and thus would not constantly generate emissions. Furthermore, it is anticipated that these planned projects would occur more than 1,000 feet from existing sensitive receptors. Given the intermittent nature of construction activities and the buffer distance, it is unlikely that KWB construction activities would combine with similar effects from other groundwater banks to expose a substantial number of receptors to odorous emissions.

Grazing activities would be similar to those described for 1996–2014 and would not be anticipated to generate substantial odor emissions. SJVAPCD would continue to regulate burns (i.e. enforcement and administering Rules 4103 and 4106) throughout its jurisdiction to ensure that burns do not affect overall air quality. KWB's O&M activities would be required to obtain permits from SJVAPCD for burns and comply with all applicable requirements, which would minimize potential odor impacts to surrounding receptors. With compliance with SJVAPCD Rules 4103 and 4106, the impact of KWB construction and O&M activities, in association with similar activities among other cumulative projects, would be extremely unlikely to combine into significant cumulative impacts regarding objectionable odors. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-48 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable air pollutant emissions as a result of potential changes in agricultural practices.

KWB activities provide a more reliable water supply for KWB participants in Kern and Kings Counties. These water districts use KWB recovered water for their agricultural users. Therefore, increasing the reliability and capacity of KWB water services would also facilitate continued agricultural operations. In October 2015, an agricultural-related emissions analysis (Focused Air Analysis) was performed to evaluate the air quality emissions associated with agricultural land uses that may benefit from KWB recovered water.¹⁵ The Focused Air Analysis quantified agricultural-related emissions from fugitive dust, land preparation and harvesting, and agricultural equipment, which receive water from KWB. Overall, the Focused Ag Analysis determined that ROG, NO_x, PM₁₀, and PM_{2.5} emissions associated with KWB-supplied agricultural activities would decrease by approximately 41%, 46%, 8%, and 12%, respectively, from 1995 to 2015. The ROG and NO_x reductions are a result of turnover in equipment fleets, introduction of new equipment, and increasingly stringent emissions standards. Emissions reductions for PM₁₀ and PM_{2.5} are a result of both changes in agricultural equipment mentioned above and SJVAPCD Rule 4550 (Conservation Management Practices), which limits fugitive dust emissions from agricultural operations. Exhaust-related PM₁₀ and PM_{2.5} emissions, which are primarily diesel particulate matter (diesel PM), decreased by approximately 34% from 1995 to 2015.

Fugitive dust emission sources from 1995 to 2015 reflect the changing state and county-wide commodity markets (see Section 7.6 for further discussion). Annual crops, such as cotton production (which comprised over two-thirds of the total field crop acreage in production in 1995), generally generate more fugitive dust during land preparation than during harvesting activities. Conversely, almond production (which accounted for more than 60 percent of the total nut crops in 2015) generates substantially more fugitive dust during harvesting activities than during land preparation. Pistachio, citrus, and grape production generate roughly equivalent land preparation and harvesting fugitive dust

emissions, but the overall emissions on a per-acre basis are substantially less than that of cotton and almonds.

The SJVAPCD adopted Rule 4550, Conservation Management Practices, on May 20, 2004 to limit fugitive dust emissions (PM₁₀ and PM_{2.5}) from agricultural operation sites. Rule 4550 requires agricultural operation sites to implement a minimum number of conservation management practices (CMPs). Examples of CMPs include reducing or eliminating the need to disturb soil, protecting soil from wind, modifying equipment or processes to physically produce less dust, applying dust suppressants, and planting tree crops such as trees and vines. Rule 4550 requires growers with 100 or more contiguous acres to complete a CMP Plan and to implement the applicable CMPs as detailed in the Plan.

Subsequent to 1995, state and federal emission standards for new non-road diesel engines have been phased in and diesel fuel standards have enabled the use of sulfur-sensitive combustion control technology to meet the latest, more stringent emission standards. The result has been lower emissions of nitrogen oxides (NO_x), PM, reactive organic gases (ROG), sulphur oxides, and carbon monoxide from new mobile agricultural equipment. Emissions have been further reduced through incentive programs that are designed to accelerate the replacement of older, higher-emitting agricultural equipment.

Based on the historical trend of converting seed, field and vegetable crops to perennial crops in Kern County and the KWB participants' service area, it is possible that KWB activities in combination with cumulative water banking and development projects could contribute to the conversion of additional land to permanent crops. The trend of shifting from annual crops to permanent tree and vineyard crops is expected to continue in the future with or without KWB activities. However, a combination of federal and state regulations and SJVAPCD rules and incentive programs have resulted in substantial decreases in agriculturally-related air pollutant emissions. These various rules, regulations, and incentive programs have resulted in substantial reductions in emissions from land preparation, harvesting, mobile agricultural equipment, agricultural burning, and windblown dust from agricultural land, paved and unpaved roads, and other sources. The decreases in agriculturally-related air pollutant emissions are expected to continue.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact regarding air pollutant emissions as a result of potential changes in agricultural practices. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.8 Geology, Soils, and Mineral Resources

10.1-49 Implementation of KWB activities in combination with regional and local water banking projects could expose people and structures to risks from unstable soils (liquefaction).

The KWB and cumulative water banking projects are located in a seismically active area. The White Wolf and San Andreas Faults are considered active and are known to have produced large-magnitude earthquakes in the Kern Fan area.

Although KWB Lands consist of unconsolidated Holocene sediments (which are more susceptible to liquefaction), the depth to groundwater is typically 50 feet or greater bgs. Therefore, the liquefaction

potential is low and no significant cumulative impact would be expected to occur from KWB activities and other cumulative projects. Furthermore, KWB activities would have no effect on liquefaction.

KWB activities would not result in a cumulatively considerable incremental contribution to significant cumulative hazards related to liquefaction. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-50 Implementation of KWB activities in combination with regional and local water banking projects could cause or contribute to subsidence as a result of groundwater extraction.

In Kern County, land subsidence is caused primarily by the dewatering and subsequent compaction of unconsolidated clay and silt deposits within the groundwater aquifer, and oil and natural gas extraction.¹⁶

The KWB aquifer contains a substantial amount of sand, with lesser amounts of gravel, silt, and clay.¹⁷ Aquifers with higher volumes of sand and gravel are not as susceptible to compaction as aquifers with higher volumes of clays and fine silts. A continuous reading extensometer located in KWB has shown little response to changes in water level changes during recharge or recovery operations.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on subsidence as a result of groundwater extraction. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-51 Implementation of KWB activities in combination with regional and local water banking projects could contribute to movement on regional faults.

Several researchers have indicated that historic fault creep along the Buena Vista, Premier, New Hope, and Kern Front Faults, as well as historic-period fault breaks along the Garlock Fault zone (in the Fremont Valley), are the result of subsurface withdrawal of oil, natural gas, and/or groundwater.^{18,19,20,21} KWB Lands are not, however, within the immediate vicinity of these areas, and there is no evidence of fault creep that could affect or be affected by KWB activities.

KWB activities have not and would not cause a cumulatively considerable incremental contribution to a significant cumulative impact related to movements on regional faults. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-52 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase soil erosion.

Grading would be required to construct the proposed facilities, including the recharge ponds. Construction of the ponds and other improvements would occur on topography that is relatively flat and that would require only minor grading and compaction of soils. Soils on KWB Lands can generally be characterized as being moderately to highly erodible. KWBA is subject to legal requirements regarding NPDES permits (see Section 7.0.4.1.1 covering NPDES permits) and is obligated to carry out the measures (see Section 7.0.4.2.1 covering HCP Incidental Take Permits and Section 7.0.4.3.1 covering the 1997 Monterey IS and Addendum).

It is highly unlikely that soil erosion from KWB activities would combine with soil erosion from other cumulative projects. Such impacts would be highly site specific and geographically and temporally isolated. KWB activities have not and would not cause a cumulatively considerable incremental contribution to a significant cumulative impact related to soil erosion. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-53 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase soil erosion as a result of potential changes in agricultural practices.

Agricultural activities include plowing, which disturbs the soil profile to a deeper level; discing, which disturbs the soil profile to a shallower level; and other ground-disturbing activities. The maintenance of annual crops usually involves plowing. These activities could result in land disturbance that increases the rate of soil erosion.

Based on the historical trend of converting annual seed, field, and vegetable crops to permanent crops in Kern County and the KWB participants' service area, it is possible that KWB activities in combination with cumulative water banking projects could result in the conversion of additional land to permanent crops. The trend of replacing irrigated annual crops with permanent crops is expected to continue in the future with or without KWB activities. Because permanent crops like orchards would require substantially fewer ground-disturbing activities associated with crop production, the conversion to permanent crops would likely reduce the amount of soil erosion over the long term. No significant cumulative impact would occur. Therefore, KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on erosion as a result of potential changes in agricultural practices. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.9 Recreation

The cumulative context for recreation consists of recreation on KWB Lands and the local area.

10.1-54 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable impacts on waterfowl and related recreational resources.

It is expected that existing limited public recreation use for hunting, interpretation, education, birdwatching, and hiking would continue, and possibly increase, as a result of existing KWB activities in combination with KWB's proposed projects to develop additional recharge ponds and ancillary facilities. KWB recharge operations with KWBA's proposed IRWM Project (Kern Water Bank Conservation and Storage Project) would not change substantially such that any of these recreation activities would be adversely affected. Moreover, development of several additional recharge ponds could increase the extent, quality, and availability of waterfowl habitat and recreation opportunities.

KWB recharge pond expansion and recharge operations would likely result in a beneficial impact on recreation resources on KWB Lands. Therefore, there would be ***no cumulative impact***.

Mitigation Measures

None required.

10.1.5.10 Land Use and Planning

The cumulative context for land use and planning consists of cumulative water banking and development projects in the local area and region.

10.1-55 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially conflict with adopted general plan policies, land use designations, and zoning codes.

Construction of past KWBA facilities and construction of probable future KWBA facilities are in areas designated by the *Kern County General Plan* as Intensive Agriculture and Mineral and Petroleum and in areas designated by the *Metropolitan Bakersfield General Plan* as Intensive Agriculture, Mineral and Petroleum, and Open Space. The entirety of KWB Lands is zoned by Kern County as A (Exclusive Agriculture). Groundwater recharge facilities, including conveyance structures, are allowable land uses under the Intensive Agriculture, Mineral and Petroleum, and Open Space land use designations. In addition, construction of groundwater recharge facilities is a permitted use within the A zoning district.

Other water banking programs and projects in unincorporated Kern County, such as the Strand Ranch Integrated Banking Project and Stockdale West/Strand Ranch Water Banking Project, would be required to comply with the *Kern County General Plan* policies, land use designations, and zoning codes, as applicable. Other water banking programs and projects in Kings County would be required to comply with the applicable *Kings County General Plan* policies, land use designations, and zoning codes. If the land use planning authority were to change existing land use designations and zoning, the appropriate environmental review would be undertaken to approve such a change at that time. Therefore, KWB activities in combination with cumulative water banking projects in the local area and region would not conflict with general plan policies or result in inconsistencies with land use designations or zoning. Thus, no significant cumulative impact would occur.

KWB activities would not result in a cumulatively considerable incremental contribution to potential conflicts with applicable general plan policies, land use designations, and zoning codes. Therefore, there would be ***no cumulative impact***.

Mitigation Measures

None required.

10.1-56 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts on land use patterns as a result of potential changes in agricultural practices.

KWB activities have increased water supply reliability, which may result in changes from seed, field and vegetable crops on land that could be fallowed in dry/critically dry years to permanent crops like orchards and vines that require a dedicated water supply. Water banking and other water supply projects in the local area and region that contribute to the availability and reliability of water supplies could continue to contribute to the existing trend to permanent crops.

Based on the historical trend of converting to permanent crops in Kern County and the KWB participants' service area, it is possible that KWB activities and cumulative water banking projects would contribute to the conversion of additional land to permanent crops. This trend is expected to continue in the future with or without KWB activities. These changes in cropping patterns could alter land use patterns; however, agricultural use would continue and there would be no change in land use. No significant cumulative impact would occur. KWB activities would not result in a cumulatively considerable incremental contribution to effects on land use patterns as a result of potential changes in agricultural practices. This impact would be a *less-than-significant cumulative impact*.

Mitigation Measures

None required.

10.1.5.11 Hazards and Hazardous Materials

Impacts associated with the past or current uses of a project site usually occur on a project-by-project basis and are generally limited to the specific project site. Therefore, significant cumulative impacts generally do not occur because site-specific impacts do not overlap geographically with other similar impacts. The cumulative context for hazards and hazardous materials primarily consists of past, present, and probable future KWB activities on KWB Lands and possibly immediately adjacent lands.

10.1-57 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts related to the creation of a hazard to the public or environment through routine transport, use, or disposal of hazardous materials.

KWB activities involve construction activities at several locations on KWB Lands. Such activities would require the use of heavy equipment that would contain fuels and lubricants, which contain hazardous compounds. An accidental release of these materials could injure construction workers, contaminate soil or water, or present a fire/explosion hazard.

Construction contracts would include specific language requiring contractors to comply with applicable State hazardous materials management laws and regulations. These laws and regulations, found in California Code of Regulations (CCR) Titles 19 and 22, address proper storage and disposal of substances such as fuels. In addition, CCR Title 8 addresses the use of hazardous products in the work environment and would apply to construction contractors. Hazardous material transport would comply with any California Department of Transportation requirements and regulations. The potential for inadvertent spills of materials, which could affect nearby surface water bodies or groundwater, would be managed through construction site best management practices.

KWBA is subject to legal requirements regarding NPDES permits and is obligated to carry out the measures. Additionally, KWB activities would also include measures which were outlined in the 1997 Monterey IS and Addendum, including the use of a watering truck to minimize fugitive dust generation and ensure the use of rodenticides and herbicides are in accordance with the KWB HCP/NCCP Vegetation Management Plan (Appendix 7-7c) and a Worker Environmental Awareness Program (WEAP) in accordance with the 2016 KWBA Resolution (Appendix 7-5b).

No other cumulative water banking and development projects would occur on KWB Lands and, therefore, there would likely not be any spatial overlap in potential cumulative impact. No significant cumulative impact would occur. KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact associated with routine transport, use, or disposal of hazardous materials. This impact would be a ***less-than-significant cumulative impact***.

10.1-58 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in airborne vector populations or in the likelihood of waterborne disease or illness.

KWB activities on KWB Lands and cumulative water banking projects near KWB Lands include construction and operation of recharge ponds by KWBA, Rosedale, and others. The construction of recharge ponds may disturb the soil and cause the San Joaquin Valley fever fungus to become airborne during earthmoving activities. The recharge basins can lead to standing pools of water and may increase areas for vectors to gather and provide a breeding ground for mosquito larvae. KWBA has a mosquito abatement plan in place and would implement other mitigation as specified in Section 7.11, Hazards and Hazardous Materials. The cumulative effect of additional and/or expanded nearby groundwater banking programs, in association with KWB expansion, could result in greater exposure to mosquitoes and Valley fever. The KWB activities could have a cumulatively considerable incremental contribution to increased airborne vector populations or the likelihood of waterborne disease or illness.

Consequently, KWB activities could make a cumulatively considerable incremental contribution to a potentially significant cumulative impact related to airborne vector populations or waterborne disease or illness. This impact would be a ***potentially significant cumulative impact***.

Mitigation Measures

Implementation of the following mitigation measure would substantially reduce the contribution of the KWB activities to the cumulative impacts with the regard to airborne vector populations or the likelihood of waterborne disease or illness. KWB activities will include measures which were outlined in the 1997 Monterey IS and Addendum, including the implementation of a Mosquito Abatement Plan, and requiring implementation of a WEAP program which includes providing construction workers at risk of inhaling dust with appropriate masks intended to prevent the Valley Fever fungus.

The cumulatively considerable incremental contribution would be less than considerable with mitigation. Therefore, this impact would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-58 *KWBA will implement Mitigation Measure 7.11-6.*

10.1.5.12 Noise

The cumulative context for noise is the immediate vicinity of KWB activities on KWB Lands.

10.1-59 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in noise levels near sensitive receptors.

KWB operations require pumping to convey water to recharge ponds and extract water from underground. A representative range of noise levels for electric pumps is estimated to be 68 to 72 A-weighted decibels at 50 feet (see Table 7.12-5 in Section 7.12, Noise). If proper mufflers are provided, noise levels could be reduced. However, even without mufflers, increased noise levels would not affect sensitive noise receptors because the pumps are located in relatively remote areas far from homes and other sensitive receptors. The installation and operation of pumps for recharge ponds on KWB Lands attributable to KWB activities and KWBA's proposed IRWM and build-out projects could result in an increase in noise levels, primarily during construction. However, increased noise levels would not affect sensitive noise receptors because construction and pump operations are located in relatively remote areas far from homes and other sensitive receptors. Additionally, maintenance of the new facilities would occur intermittently and would create only minimal noise.

Noise levels are not directly additive, and they attenuate rapidly with distance. Noise associated with KWB pumps would be localized to KWB Lands and would not combine with noise from other water banking and development projects to produce cumulative noise impacts. No significant cumulative impact would occur.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to noise. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-60 Implementation of KWB activities in combination with regional and local water banking projects could potentially increase noise levels as a result of potential changes in agricultural practices.

Based on the historical trend of converting to permanent crops in Kern County and the KWB participants' service area, it is possible that KWB activities in combination with cumulative water banking projects could contribute to the conversion of additional land to permanent crops. This trend is expected to continue in the future with or without KWB activities. It is not expected that cumulative noise levels associated with changes in traffic volumes on rural roadways would increase substantially because of these changes in cropping patterns; the number of vehicular trips on rural roadways to fields with permanent crops associated with KWB activities and cumulative water banking projects would likely be the same as or slightly less than the number of trips to fields with annual crops.

No significant impact would occur. KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to noise as a result of potential changes in agricultural practices. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.13 Cultural and Paleontological Resources

The cumulative context for cultural and paleontological resources consists of reasonably foreseeable groundwater banking and development projects on and near KWB Lands where ground-disturbing activities occur during construction.

10.1-61 Implementation of KWB activities in combination with regional and local water banking and development projects could potentially result in cumulatively considerable impacts related to the damage to and/or destruction of cultural and paleontological resources.

Native Americans, specifically the Southern Valley Yokuts, occupied the southern portion of the San Joaquin Valley in Kern and Kings Counties; therefore, archaeological sites could be present. As discussed in Section 7.13, Cultural and Paleontological Resources, prehistoric sites have been recorded on KWB Lands and paleontological deposits have been identified in the southern portion of the county. Some of these deposits are exposed and others are buried.

KWB activities involve construction of additional recharge basins, wells, and ancillary facilities on KWB Lands that could expose cultural resources to damage and/or destruction. Other cumulative projects that involve ground-breaking activities, such as during construction, could also adversely affect cultural and paleontological resources. Prior to KWB construction activities, archaeological investigations were completed in the Kern Fan Element and for the KWB HCP/NCCP. Some of these investigations recorded significant archaeological sites at or near KWB Lands. Known cultural sites were avoided and/or preserved, and no new cultural sites were discovered during ground-disturbing construction activities during 1996-2014. Mitigation measures were also adopted in the 1997 Monterey IS and Addendum to ensure that if previously unidentified archaeological resources were discovered during construction activities, that work would cease and a qualified archaeologist would examine the discovery and make recommendations for appropriate data recovery.

Well drilling and refurbishing activities associated with groundwater recharge, extraction, and monitoring may occur in the Older Alluvium, Older Stream and Terrace Deposits, and Tulare Formation. As discussed in Section 7.13, because of the number of vertebrate fossils that have been recovered there, these formations are considered paleontologically sensitive. Construction of cumulative water banking and development projects could increase the risk of damage to or destruction of known or previously unidentified cultural and paleontological resources.

KWB construction activities could make a cumulatively considerable incremental contribution to an overall significant cumulative impact with respect to cultural and paleontological resources. This impact to cultural and paleontological resources would be a ***potentially significant cumulative impact***.

Mitigation Measures

Impacts to cultural resources would be reduced to less than significant through implementation of Mitigation Measure 7.13-3(a) currently implemented by KWBA. The measures outlined in Mitigation Measure 7.13(a) specify that before any ground-disturbing work on the KWB, qualified professionals must conduct a pedestrian survey and any cultural resources identified during a survey must be recorded, evaluated, and the work halted and the Kern County Coroner notified if any human remains are found.

Mitigation Measure 7.13-3(b) requires that construction workers be alerted to the possibility of encountering paleontological resources, and specifies that if resources are encountered, fossil specimens would be recovered and recorded and would undergo appropriate curation.

Implementation of the following mitigation measures would substantially reduce the contribution of the KWB activities to the cumulative impacts associated with the damage or destruction of cultural and paleontological resources. KWBA is obligated to implement 7.13-1a and 7.13-1(b). Therefore, this impact to cultural resources would be a ***less-than-significant cumulative impact, with mitigation***.

10.1-61 *KWBA will implement Mitigation Measures 7.13-1(a) and 7.13-1(b).*

10.1-62 **Implementation of KWB activities in combination with regional and local water banking projects potentially result in cumulatively considerable impacts related to damage to or destruction of cultural and paleontological resources as a result of potential changes in agricultural practices.**

Agricultural activities include plowing, discing, and other ground-disturbing activities. The maintenance of annual seed, field, and vegetable crops usually involves plowing, which disturbs the soil profile to a deeper level. The maintenance of permanent crops or fallow land usually involves discing for weed control, which disturbs the soil profile to a shallower level. Because the reliability and availability of agricultural water supplies can affect the amount and types of crops that farmers plant, the extent and frequency of land disturbance is also expected to vary in response to water availability, as well as local, regional, and even global economic factors.

Agricultural activity existed before KWB activities began and the land had been disturbed for a variety of agricultural uses, depending on factors such as the availability of water. Based on the historical trend of converting annual to permanent crops in Kern County and the KWB participants' service area, it is possible that KWB activities in combination with cumulative water banking programs and projects could contribute to the conversion of additional land to permanent crops. The trend of converting to permanent crops is expected to continue in the future with or without KWB activities. Ground disturbance associated with changes in agricultural practices would be similar and highly unlikely to expose more cultural artifacts or fossils because similar ground-disturbing activities are associated with all cultivated agricultural land.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact to cultural and paleontological resources. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.14 Public Services and Utilities

The cumulative context for public services and utilities consists of potential impacts on or near KWB Lands.

10.1-63 **Implementation of KWB activities in combination with regional and local water banking and local development projects on or near KWB Lands could potentially result in cumulatively considerable impacts related to the need for new or expanded governmental facilities or an increase in demand for public services and utilities.**

As discussed in Section 7.14, Public Services and Utilities, KWB activities would not directly result in population changes that would generate a need for new or expanded governmental facilities or an increase in demand for public services (i.e., schools, parks, libraries). Similarly, there would be no increase in water supply treatment and/or distribution facilities, wastewater collection and treatment

facilities, stormwater runoff collection facilities, and/or solid waste collection and disposal. KWB activities would increase demand for fire and police protection services, but not to the extent that the construction of new or expansion of existing fire and police protection services and facilities would be required to maintain acceptable service ratios and response times.

KWBA's proposed future recharge pond expansion projects, and other proposed groundwater banking projects, would not directly result in population changes from construction of housing or businesses that would generate a need for new or expanded governmental facilities or an increase in demand for public services (i.e., schools, parks, libraries) and utilities (i.e., water supply treatment and/or distribution facilities, wastewater collection and treatment facilities, stormwater runoff collection facilities, and/or solid waste collection and disposal). No significant cumulative impact would occur.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on the need for new or expanded government facilities or an increase in demand for public services and utilities. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.15 Traffic and Transportation

The cumulative context for traffic and transportation consists of potential impacts at or near KWB Lands.

10.1-64 Implementation of KWB activities in combination with regional and local water banking and local development projects on or near KWB Lands could potentially result in cumulatively considerable increases in traffic.

Traffic volumes associated with KWB activities and KWBA's proposed future recharge expansion projects would temporarily increase on some rural roads during construction. In addition, routine maintenance of the new facilities would result in a permanent increase in vehicular traffic on rural roads but the increase would be extremely minor. The small increases in vehicular movements attributable to KWB activities and KWBA's proposed future recharge expansion projects would result in a small, increase in average daily traffic levels and traffic flow on the affected rural roads in the vicinity of KWB Lands. Significant traffic and transportation cumulative impacts in the Bakersfield and other urban areas would result from future development. However, KWB activities would have a minimal impact on cumulative traffic and transportation patterns within the general KWB and Bakersfield area when considered with other banking and development projects.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on traffic and transportation. Therefore, this impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1-65 Implementation of KWB activities in combination with regional and local water banking projects could potentially result in cumulatively considerable increases in traffic as a result of potential changes in agricultural practices.

Based on the historical trend of converting annual seed, field, and vegetable crops to permanent tree and vineyard crops in Kern County and the KWB participants' service area, it is possible that KWB activities in combination with cumulative water banking and other water supply projects could result in the conversion of additional land to permanent crops. This trend is expected to continue in the future with or without KWB activities. It is not expected that cumulative traffic volumes on rural roadways would increase because the number of vehicular trips on rural roadways to fields with permanent crops would likely be the same as or slightly less than the number of trips to fields with annual crops. No significant cumulative impact would occur.

KWB activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to traffic increases as a result of potential changes in agricultural practices. This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.16 Energy

The cumulative context for energy consists of cumulative water banking, development, and capital improvement projects in Kern County and the region as well as reasonably foreseeable projects in the Pacific Gas & Electric Company (PG&E) service area, which includes all KWB Lands.

10.1-66 Implementation of KWB activities in combination with regional and local water banking, development, and capital improvement projects could develop land uses and patterns that cause cumulatively considerable impacts associated with the wasteful, inefficient, and unnecessary consumption of energy.

Increased demand for electrical and natural gas supplies and infrastructure is a byproduct of all future land uses and development in the southern San Joaquin Valley. Energy is consumed for heating, cooling, and electricity in homes and businesses; for public infrastructure and service operations; and for agriculture, industry, and commercial uses. The cumulative water banking projects, development projects, and capital improvement projects listed in Table 10.1-1 vary in size and have different amounts of development that would be expected to increase the consumption of energy. Each service provider is responsible for adequately providing these utilities within their jurisdictional boundaries and for upgrading their existing electrical and natural gas distribution systems or constructing new distribution systems to meet the demands of individual projects.

Construction-Related Energy Consumption

KWB activities would increase energy consumption during construction. However, construction associated with KWB future projects is not extensive and is similar to past construction-related activities. Energy consumption rates for construction equipment and vehicles would be reduced from past KWB construction activities because of improved fuel efficiency technologies and turnover in the KWBA's vehicle and equipment fleet used for KWB activities over time. The proposed KWBA construction projects would incrementally increase electricity demand beyond current levels; however, it is not anticipated that the planned construction projects would require PG&E to construct new electricity facilities that could cause additional environmental impacts.

This impact would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

Operational and Maintenance Energy Consumption

KWBA's O&M activities would consume energy in the form of petroleum fuel for equipment and on-road vehicles, and electricity for water recovery and conveyance. It is anticipated that as fuel efficiency increases and KWBA's vehicle fleets used for KWB activities turn over, the energy efficiency of construction equipment and vehicles would increase. In addition, the energy efficiency of O&M activities would increase as new water pumps and conveyance infrastructure are installed for the proposed future construction projects. Similarly, as older water pumps and conveyance infrastructure are replaced, retrofitted, or tuned, O&M activities would increase in energy efficiency. It is anticipated that the energy efficiency of future O&M activities would gradually increase with time.

KWB's activities would continue to use a similar amount of electrical energy as during 1996-2014. However, PG&E would continue increasing its renewable energy portfolio to meet its 2020 and 2030 Renewable Portfolio Standard (RPS) requirements and, as of April 2016, is continuing to administer the Advanced Pump Efficiency Program (APEP), which assists in KWBA's pump rehabilitation, retrofit, and replacement actions. KWBA has historically and currently performs pump efficiency actions to monitor and maintain pumps at optimal working conditions; there is no formal mechanism to require these pump efficiency actions that minimize energy consumption. Therefore, consistency with Scoping Plan Measure W-3 (Water System Energy Efficiency)(see Chapter 12, Climate Change, Mitigation Measure 12-1) cannot be tracked as part of an official plan or program approved by the KWBA Board of Directors. Furthermore, other groundwater banking programs may or may not minimize energy consumption to the same level as KWBA. Although KWBA's O&M activities would not consume energy in a more inefficient, wasteful, or unnecessary fashion than other similar O&M activities in the region, for the purposes of a conservative analysis, it is assumed that without a formal pump efficiency plan, KWBA operational and maintenance activities might result in a cumulatively considerable incremental contribution to a significant cumulative impact with respect to energy consumption. This impact would be a ***potentially significant cumulative impact***.

Mitigation Measures

Mitigation Measure 12.1 requires a formal Pump System Energy Efficiency Plan (PSEEP) to ensure that O&M activities are efficient. In addition, as new recharge ponds, water pumps, and conveyance infrastructures are installed in the future, procurements would be required to meet the most currently applicable pump efficiency standards as required in Mitigation Measure 12-1. Similarly, as older water pumps and conveyance infrastructures are replaced through passive turnover (not required in the PSEEP), O&M activities would increase in energy efficiency. Therefore, it is anticipated that the energy efficiency of future O&M activities would gradually increase with time independent of the PG&E APEP and Mitigation Measure 12-1. Mitigation Measure 12.1 would reduce impacts of KWB activities with regard to energy resources to less than significant. Therefore, KWB's O&M activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact from 2015 to 2030 with regard to energy consumption. This impact would be a ***less-than-significant, cumulative impact, with mitigation***.

10.1-66 *KWBA will implement Mitigation Measure 12-1.*

10.1-67 **Implementation of KWB activities in combination with regional and local water banking and local development projects could potentially require or result in the construction of new electrical or natural gas facilities.**

KWB facilities are provided with electricity and natural gas by PG&E. In terms of cumulative impacts, PG&E is responsible for providing adequate public utilities within its service boundaries. The cumulative water banking and development projects listed in Table 10.1-1 vary in size and have different amounts of development, and therefore also would be expected to increase the demand for electricity and natural gas supplies and related infrastructure. Individual cumulative projects within PG&E's service area would be required to assess project impacts during the environmental review process to ensure that PG&E has sufficient electrical and natural gas supplies to meet demand.

KWBA's O&M activities would require electricity to operate planned water pumps and other related water conveyance infrastructure. However, it is anticipated that KWBA's planned construction activities would not require PG&E to construct any new electricity facilities that would generate no more than minimal, if any, environmental impacts. KWB activities, therefore, would not make a cumulatively considerable incremental contribution to a significant cumulative impact requiring new electrical or natural gas facilities. This would be a ***less-than-significant cumulative impact***.

Mitigation Measures

None required.

10.1.5.17 Climate Change

The proper context for addressing global climate change is as a discussion of cumulative impacts. Although the emissions of one single project will not cause global climate change, greenhouse gas (GHG) emissions have global effects because of their long atmospheric lifetime and resulting long-term ability to continue contributing to climate change.

Cumulative climate change impacts are discussed in Chapter 12, Climate Change, and are summarized below.

10.1-68 Implementation of KWB activities in combination with regional and local water banking projects could potentially generate cumulatively considerable GHG emissions.

Construction

As presented in Table 12-4 in Chapter 12, it is reasonable to assume that construction-related GHG emissions from 1996 to 2014 would also be similar in magnitude and intensity to the planned future construction emissions shown in Table 12-4 for KWB activities, and would also fall below SMAQMD's construction-related threshold of significance. In addition, KWB-related construction emissions would be substantially less than any of the other contextual thresholds shown for GHG emissions. Therefore, KWB construction activities would not result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change and this cumulative impact would be a ***less-than-significant cumulative impact***.

Operations and Maintenance

The future O&M activities associated with KWB activities are anticipated to be similar to those shown in Table 12-3 in Chapter 12. Even with the addition of the KWB IRWM program and proposed future full buildout, O&M activities are not anticipated to increase substantially beyond the previous O&M levels. As shown in Table 12-3, annual 2015 KWB O&M activities would generate approximately 11,732 MT CO₂e, which would slightly exceed all but the highest contextual thresholds of significance presented in Standards of Significance. KWB's annual emissions would not exceed the Council of Environmental

Quality's quantitative analysis threshold (i.e., 25,000 million metric tons of carbon dioxide equivalent per year [MT CO₂e/yr]) or the U.S. Environmental Protection Agency's Mandatory Reporting threshold (i.e., 25,000 MT CO₂e/yr).

After 2015, it is anticipated that turnover in the vehicle and equipment fleet and improvements to emissions technology would cause emission rates for vehicles and equipment to decrease over time. Electricity-related GHG emissions also would decrease as a result of statewide GHG reduction measures that would reduce electricity-related GHG emissions, such as the RPS (see Senate Bills 1078 and 107 and Executive Orders S-14-08 and S-21-09) and Senate Bill 350. In addition, as PG&E continues to add renewable resources to its electricity portfolio, the GHG intensity of electricity used for O&M activities and overall electricity-related GHG emissions would decrease. These emissions account for approximately 91% of the KWB's current (2015) annual GHG emissions.

Although KWB has historically and currently performs pump efficiency actions to monitor and maintain pumps at optimal working conditions, there is no formal mechanism to require these pump efficiency actions. Therefore, consistency with Scoping Plan Measure W-3 (Water System Energy Efficiency) cannot be tracked as part of an official plan or program approved by the KWBA Board of Directors. Thus, for the purposes of a conservative analysis, it is assumed that without a formal pump efficiency plan, the KWBA might not be consistent with the applicable water-related Scoping Plan measures (i.e., Measure W-3). KWB's 2015–2030 O&M GHG emissions could result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change. This impact would be a **potentially significant cumulative impact**.

Mitigation Measures

As shown in Table 12-5 in Chapter 12, accounting for statewide reduction measures that would occur independently of KWB operations, KWB O&M activities would achieve an approximate 15% and 34% reduction from 2015 levels by 2020 and 2030, respectively. In addition, these emissions levels would be below all of the contextual thresholds of significance except for SMAQMD's construction and operational GHG thresholds developed for land use development projects. Furthermore, with implementation of Mitigation Measure 12-1, a formal PSEEP would ensure that O&M activities comply with the Scoping Plan's Measure W-3. Considering that statewide reduction measures would continue to reduce KWB's O&M GHG emissions, that future 2020 and 2030 emission levels would be less than most contextual thresholds, and that KWBA has adopted a formal pump efficiency program as part of Mitigation Measure 12-1, KWB's future O&M GHG emissions would not result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change.

KWBA is obligated to carry out the measures in Mitigation Measure 12-1. Therefore, impacts from KWB activities with regard to the cumulative impact on GHG emissions would not be cumulatively considerable and this impact would be a **less-than-significant cumulative impact, with mitigation**.

10.1-68 *KWBA will implement Mitigation Measure 12-1.*

10.1.5.18 Growth-Inducing Impacts

Growth-inducing impacts are covered in Chapter 8, Growth-Inducing Impacts, and summarized herein.

The stored water supply that is made available as a result of the KWB contributes to meeting the needs of KWB participants ID4 and TCWD. In both cases, the KWB stored water is one of several water sources relied upon by these two water suppliers as well as other water management options (i.e., reclaimed water). Participation in the KWB provides greater flexibility for these water suppliers, allowing them to use surface water when it is available and bank water to use in dry years. Additionally, in 2011, Irvine Ranch Water District obtained participation rights in the KWB through Dudley Ridge Water

District (DRWD) as a result of a land purchase in DRWD's service area. While an adequate water supply alone does not cause growth, it is a public service that supports growth and potentially related environmental impacts.

10.1-69 KWB participant water supplies provided for urban development, in combination with regional and local water banking projects, could potentially generate cumulatively considerable contributions to significant cumulative impacts from urban development.

The impacts of growth in ID4 and TCWD service areas have been analyzed in the City of Bakersfield and Kern County General Plan EIRs, respectively, and the relationship between growth and water supplies has been analyzed in applicable UWMPs and water supply assessments. When new developments are proposed within the City of Bakersfield and Kern County, the City and County prepare project-level environmental documents pursuant to CEQA. Four key EIRs cover the Tejon Industrial Complex Specific Plan and Tejon Mountain Village Specific Plan developments, which receive KWB water. These EIRs conclude that the projects would have several significant and unavoidable impacts, as summarized in Subsection 8.1.2.3 in Chapter 8.

The following significant and unavoidable cumulative impacts were identified in these EIRs:

- **Aesthetics**—Cumulatively considerable contributions to significant cumulative impacts related to visual changes from regional development, including along Interstate 5 and the Lebec Road interchange and introduction of new sources of light and glare.
- **Air Quality and Climate Change**—cumulatively considerable contributions to significant cumulative impacts on regional emissions of PM10, ROG, and NOx that exceed SJVAPCD thresholds; and cumulatively considerable contributions to significant cumulative impacts associated with GHG that do not meet AB 32 GHG reduction requirements.
- **Agricultural Resources** —Conversion of over 1,000 acres of Farmland of Statewide Importance to nonagricultural urban uses.
- **Biological Resources**—Cumulatively considerable contributions to significant cumulative impacts on the California condor population levels and range.
- **Noise**—Long-term exposure of sensitive receptors, and rural residences along Wheeler Ridge Road to increased noise from vehicular-related traffic and cumulatively considerable contributions to significant cumulative impacts on traffic noise that already exceed the County's General Plan noise standards.
- **Population and Housing**—Cumulatively considerable contributions to significant cumulative impacts from increases in population and housing relative to existing conditions.
- **Public Services**—Cumulatively considerable contributions to significant cumulative impacts related to generation of solid waste that exceed landfill capacity.
- **Transportation and Traffic**—Cumulatively considerable contributions to significant cumulative impacts from increases in traffic at intersections and freeway segments from regional development.

It is arguable whether KWB activities make a cumulative considerable incremental contribution to these identified significant cumulative impacts because of a relatively small amount of water provided by KWB participants to these urban areas. The impacts of growth in ID4 and TCWD service areas have been analyzed in the City of Bakersfield and Kern County General Plan EIRs, respectively, and the relationship between growth and water supplies has been analyzed in applicable UWMPs and water supply assessments. When new developments are proposed within the City of Bakersfield and Kern

County, the City and County prepare project-level environmental documents pursuant to CEQA. However, for the purposes of a conservative analysis, the contribution of KWB water supplies to ID4 and TCWD could have resulted in KWB activities making a cumulatively considerable incremental contribution to the significant cumulative impacts presented in bullets above. This impact would be a ***potentially significant cumulative impact***.

Mitigation Measures

The impacts identified above are significant and unavoidable impacts. There are no feasible mitigation measures or alternatives available to mitigate the impacts to less-than-significant levels.

Moreover, the Department and KWBA lack the authority to approve or deny development projects or to impose mitigation to address significant environmental impacts associated with development projects; that authority resides with local cities and counties. As discussed in Subsection 8.1.2.4, Local Decision Making on Land Use Planning, decisions regarding growth are made through the general planning process at regional and local levels. Cities and counties in the service areas affected by the increased population are responsible for considering the environmental effects of their growth and land use planning decisions. In addition, numerous federal, state, regional, and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment. Where appropriate, they must consider feasible mitigation measures, feasible alternatives, and statements of overriding considerations.

Since no feasible mitigation is available, the resources identified above (Aesthetics, Air Quality and Climate Change, Agricultural Resources, Biological Resources, Noise, Population and Housing, Public Services, and Transportation and Traffic), and the specific impacts ascribed to them, cannot be mitigated and the cumulative impact is ***significant and unavoidable***.

ENDNOTES

- 1 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
- 2 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
3. Kern County. 2002 (November). *Final Environmental Impact Report Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 4 Kern County. 2005 (July). *Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 5 Kern County. 2009 (August). *Final Environmental Impact Report Tejon Mountain Village by TMV, LLC*. State Clearinghouse No. 2005101018.
- 6 Kern County. 2000 (February). *Tejon Industrial Complex Final Environmental Impact Report*. State Clearinghouse No. 99061016
- 7 Stantac. 2005 (December). Tejon-Castac 2005 Urban Water Management Plan.
- 8 Kern County. 2002 (November). *Final Environmental Impact Report Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 9 Kern County. 2005 (July). *Draft Environmental Impact Report Supplemental Analysis Tejon Industrial Complex East Specific Plan*. State Clearinghouse No. 2001101133.
- 10 Kern County. 2009 (August). *Final Environmental Impact Report Tejon Mountain Village by TMV, LLC*. State Clearinghouse No. 2005101018.
- 11 Kern County. 2000 (February). *Tejon Industrial Complex Final Environmental Impact Report*. State Clearinghouse No. 99061016.
12. California Department of Conservation. 2012. *Kern County Farmland 2010–2012 Conversion Report*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
13. Sumner, Danile A., et al. 2015. The Economic impacts of the California Almond Industry. Available: https://www.google.com/search?q=economic+impacts+of+california+almond+industry+by+UC+Davis&gws_rd=ssl. Accessed March 9, 2016.
14. San Joaquin Valley Air Pollution Control District. 2015 (March). *Guidance for Assessing and Mitigating Air Quality Impacts*. Available: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed December 27, 2015.
15. Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
16. Sneed, M., J. Brandt, and M. Solt. 2013. *Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10*. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.

17. California Department of Water Resources, Draft Environmental Impact Report on Kern Water Bank Project, 1986.
18. Jennings, C. W. 1994. Fault Activity Map of California and Adjacent Areas. Geologic Data Map No. 6. Sacramento: California Division of Mines and Geology.
19. Smith, T. G. 1984 (May). Buena Vista Fault, Kern County. Fault Evaluation Report FER-163. California Division of Mines and Geology. Sacramento, CA.
20. Smith, T. G. 1983 (December). Kern Front, New Hope, and Premier Faults, Kern County. Fault Evaluation Report FER-143. California Division of Mines and Geology. Sacramento, CA.
21. Castle, R. O., J. P. Church, R. F. Yerkes, and J. C. Manning. 1983. Historical Surface Deformation near Oildale, California. U.S. Geological Survey Professional Paper 1245. U.S. Government Printing Office. Washington, DC.

10.2 SIGNIFICANT AND UNAVOIDABLE IMPACTS (NEW)

10.2 SIGNIFICANT AND UNAVOIDABLE IMPACTS (NEW)

The following is a summary of potentially significant and unavoidable impacts identified and discussed in the technical sections of this REIR. Potentially significant and unavoidable impacts were identified for certain cumulative impacts related to growth (see Chapter 8, Growth-Inducing Impacts, and Section 10.1, Cumulative Environmental Impacts, for detailed information on these impacts).

California Environmental Quality Act (CEQA) Guidelines Section 15126.2(b) states that an EIR must include a description of those impacts identified as potentially significant and unavoidable should the proposed action be implemented. These impacts are unavoidable because it has been determined that no feasible mitigation is available to reduce the significant impact to a level that is less than significant.

The final determination of significance of impacts and of the feasibility of available mitigation measures would be made by the California Department of Water Resources (Department) as part of its action to certify the REIR.

Potential environmental impacts that would result from KWB activities are presented in Chapters 7, 8, 10, and 12 of this REIR and summarized in the Introduction/Executive Summary. Those impacts that cannot be feasibly mitigated to a less-than-significant level would remain as potentially significant and unavoidable adverse impacts. Impacts found to be potentially significant and unavoidable will require adoption of a Statement of Overriding Considerations by the Department prior to certification of the REIR. Those impacts found to be potentially significant and unavoidable are as follows:

10.1-69 KWB participant water supplies provided for urban development, in combination with regional and local water banking projects, could potentially generate cumulatively considerable contributions to significant cumulative impacts from urban development.

KWB activities could make a cumulatively considerable incremental contribution to the following significant cumulative impacts associated with the following significant and unavoidable cumulative impacts identified in EIRs for the Tejon Industrial Complex Specific Plan and the Tejon Mountain Village Specific Plan developments, which receive KWB water:

- **Aesthetics**—Cumulatively considerable contributions to significant cumulative impacts related to visual changes from regional development, including along Interstate 5 and the Lebec Road interchange and introduction of new sources of light and glare.
- **Air Quality and Climate Change**—cumulatively considerable contributions to significant cumulative impacts on regional emissions of PM₁₀, ROG, and NO_x that exceed SJVAPCD thresholds; and cumulatively considerable contributions to significant cumulative impacts associated with GHG that do not meet AB 32 GHG reduction requirements.
- **Agricultural Resources**—Conversion of over 1,000 acres of Farmland of Statewide Importance to nonagricultural urban uses.
- **Biological Resources**—Cumulatively considerable contributions to significant cumulative impacts on the California condor population levels and range.

- **Noise**—Long-term exposure of sensitive receptors, and rural residences along Wheeler Ridge Road to increased noise from vehicular-related traffic and cumulatively considerable contributions to significant cumulative impacts on traffic noise that already exceed the County’s General Plan noise standards.
- **Population and Housing**—Cumulatively considerable contributions to significant cumulative impacts from increases in population and housing relative to existing conditions.
- **Public Services**—Cumulatively considerable contributions to significant cumulative impacts related to generation of solid waste that exceed landfill capacity.
- **Transportation and Traffic**—Cumulatively considerable contributions to significant cumulative impacts from increases in traffic at intersections and freeway segments from regional development.

10.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL IMPACTS (NEW)

10.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL IMPACTS (NEW)

Section 15126.2(c) of the California Environmental Quality Act (CEQA) Guidelines requires a discussion of any potentially significant irreversible environmental changes that would be caused by the proposed project. Section 15126.2(c) states:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in potentially significant irreversible environmental changes if:

- The primary and secondary impacts would generally commit future generations to similar uses in a significant manner;
- The project would involve uses in which significant irreversible damage could result from any potential environmental accidents associated with the project;
- The project would involve a significant commitment of nonrenewable resources;
- The proposed consumption of resources is significant and not justified (e.g., the project involves significant wasteful use of energy).

Implementation of the KWB activities would not directly commit future generations to similar uses because the primary effect of KWB activities is the development and continued use and operation of a water bank. KWB participants store water from sources available to them (State Water Project, Central Valley Project, and Kern River flood flows) in the KWB to recover the water at a later date.

KWB activities would increase the reliability of water deliveries in Kern County for both agricultural and urban uses. Most of the water recovered for KWB participants is used for agricultural purposes. Agricultural land use does not involve irreversible impacts to the environment.

10.3.1 GROWTH-INDUCING IMPACTS

A small amount of water recovered for KWB participants is used for urban purposes (see Chapter 8, Growth-Inducing Impacts). Future urban development could commit future generations to similar uses because restoration back to a less developed condition is not generally feasible depending on the degree of disturbance and level of capital involvement. At the local and statewide level, no change in population growth levels would result from water from the KWB used by KWB participants for urban development. The stored water supply that is made available as a result of the KWB contributes to meeting the needs of two KWB participants: Improvement District No. 4 (ID4) and Tejon-Castac Water District (TCWD). In both cases, the KWB stored water is one of several water sources relied upon by these two water suppliers as well as other water management options (i.e., reclaimed water). Participation in the KWB provides greater flexibility for these water suppliers, allowing them to use surface water when it is available and bank water to use in dry years. Additionally, in 2011, the Irvine

Ranch Water District (IRWD) obtained participation rights in the KWB through Dudley Ridge Water District (DRWD) as a result of a land purchase in DRWD's service area.

While an adequate water supply alone does not cause growth, it is a public service that supports growth. Other important factors influencing growth include: economic factors (such as employment opportunities); capacity of public services and infrastructure (e.g., wastewater, public schools, roadways); local land use policies; and land use constraints such as floodplains, sensitive habitat areas, and seismic risk zones.

Development projects that rely upon KWB recovered water, along with other more substantial water supplies, have been found to result in significant and unavoidable impacts. Therefore, it is possible that KWB activities contribute to the significant and unavoidable impacts identified for those projects.

The Department and KWBA lack the authority to approve or deny development projects or to impose mitigation to address significant environmental impacts associated with development projects; that authority resides with local cities and counties. Decisions regarding growth are made through the general planning process at regional and local levels. Cities and counties in the service areas affected by the increased population are responsible for considering the environmental effects of their growth and land use planning decisions. Availability of water is only one of many factors that land use planning agencies consider when making decisions about growth. Identifying water demands and available sources to meet those demands is now something that urban water suppliers must do in the Urban Water Management Plans and that cities and counties must do in water supply assessments required for projects above a certain size. When new developments are proposed, the cities and counties prepare environmental documents pursuant to CEQA. In addition, numerous federal, state, regional, and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment. Where appropriate, they must consider feasible mitigation measures, feasible alternatives, and statements of overriding considerations.

As discussed in Chapter 8, Growth-Inducing Impacts, KWB activities do not involve the construction of new housing directly and would not substantially expand or establish new employment opportunities that, in turn, would generate housing development. Nor would KWB activities provide water supply infrastructure to a previously undeveloped or underserved region. Compliance with all applicable building codes, as well as mitigation measures, planning policies, and standard conservation features, would ensure that natural resources, including natural gas and electrical energy, are conserved.

10.3.2 OTHER IMPACTS

KWB activities could result in the use, transport, storage, and disposal of hazardous wastes, as described in Section 7.11, Hazardous and Hazardous Materials. All activities would comply with applicable state and federal laws related to hazardous materials, which significantly reduces the likelihood and severity of accidents that could result in irreversible environmental damage.

KWB would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels and fuels for automobiles and construction equipment and could add to the cumulatively significant impact of KWB activities in conjunction with other related projects. The proposed use of energy for KWB activities is not wasteful and has been determined to be less than significant with mitigation (see Section, 7.16, Energy and Chapter 12, Climate Change). KWB operational activities require electrical energy. Pacific Gas & Electric Company, which supplies electrical energy to KWB, is required to increase its renewable energy resources which will mean that KWB activities would use less nonrenewable natural resources in the future. In addition, KWB has committed to carrying out a pump efficiency program that would help assure that its operations would

not result in the unnecessary, inefficient, or wasteful use of resources (see Mitigation Measure 12-1 in Chapter 12, Climate Change). KWB operations would also consider new technologies or systems that emerge or become more cost-effective to further reduce its reliance upon nonrenewable natural resources. Resources would also be consumed during the construction of KWB facilities. In general, groundwater banks such as the KWB require limited resources for construction since the recharge ponds themselves use limited construction materials. Some limited energy resources are required for automobiles and construction equipment.

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10.4 ENVIRONMENTAL JUSTICE (REVISED)

10.4 ENVIRONMENTAL JUSTICE (REVISED)

10.4.1 INTRODUCTION

The concept of environmental justice embraces the principles of fair treatment of all people regardless of race, color, nation of origin, or income and meaningful involvement of people within communities. Environmental justice communities are commonly identified as those where residents are: (1) predominantly minorities or low-income; (2) excluded from the environmental policy setting or decision-making process; (3) subject to a disproportionate impact from one or more environmental hazards; and (4) subject to disparate implementation of environmental regulations, requirements, practices and activities. Environmental justice efforts attempt to address the inequities of environmental protection within these communities. Legal authorities to support these efforts include both statutory and common-law protections. Both the federal government and the State of California have taken formal steps in recent years to address this issue. Environmental justice considerations associated with the proposed project are presented below. Potential effects related to growth inducement are discussed in Chapter 8.

10.4.2 ENVIRONMENTAL SETTING

The Kern Integrated Regional Water Management Plan (Kern IRWMP) identifies disadvantaged communities within the Kern County region.¹ Disadvantaged communities are defined by Propositions 50 and 84 as communities whose average Median Household Income (MHI) is less than 80 percent of the statewide annual MHI. The California MHI for 2014 was \$61,489 for 2014.² In 2014, 80 percent of the California's MHI was \$49,191.

Two communities identified by the Kern IRWMP as disadvantaged communities are located adjacent to and within one mile of Kern Water Bank (KWB) Lands. Buttonwillow is located to the northwest, and Tupman is located west of KWB Lands, respectively.

Population, race/origin, and poverty data collected for these two communities are provided for 2014 by U.S. Department of Commerce's Census Bureau 2010-2014 American Community Survey 5-Year Estimates, and are discussed further in the subsequent section.

10.4.2.1 Regional Setting

Disadvantaged community socioeconomic characteristics are shown in Tables 10.4-3 and 10.4-4. The U.S. Census publishes the results of the completed census every 10 years and provides updated estimates annually. Both 1990 and 2010 best represent. However, no specific community information is available for 1995 or earlier for Buttonwillow and Tupman. Table 10.4-3 and 10.4-4 show the relevant statistics of the existing conditions in 2014.

TABLE 10.4-3**DISADVANTAGED COMMUNITIES
RACE/ORIGIN CHARACTERISTICS, 2014**

Disadvantaged Community	Total Population	White Alone (%)	Black (%)	Amer. Indian, Eskimo or Aleut (%)	Asian or Pacific Islander (%)	Hispanic Origin (%)
Buttonwillow	1,307	16.8	6.8	0	1.5	76.2
Tupman	176	82.4	0	0	0	17.6

Source: U.S. Census Bureau 2010-2014 American Community Survey 5-Year Estimates

TABLE 10.4-4**DISADVANTAGED COMMUNITIES
POVERTY STATISTICS, 2014**

Disadvantaged Community	Median Household Income	Individuals with Income Below Poverty Levels (percent of population)	Families with Income Below Poverty Levels (percent)
Buttonwillow	34,274	26.1	27.8
Tupman	45,313	31.7	33.3

Source: U.S. Census Bureau 2010-2014 American Community Survey 5-Year Estimates

10.4.2.2 Regulatory Setting**Federal****Executive Order 12898**

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires that each federal agency, to the greatest extent practical and permitted by law, shall "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions..." Thus, federal agencies are to ensure that their actions do not result directly or indirectly in discrimination on the basis of color, race, or national origin, and that potential impacts on minority or low-income populations be taken into account during preparation of environmental and socioeconomic analyses of projects or programs that are proposed, funded, or licensed by federal agencies.

State**California Government Code Section 65040.12**

California Government Code, Section 65040.12(e), 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." California Government Code, Section 65040.12(a) designates the Governor's Office of Planning and Research (OPR) as the coordinating agency in state government for environmental justice programs, and requires OPR to develop guidelines for incorporating environmental justice into general plans.

Title 14 California Code of Regulations (CCR) Section 15131

Title 14, CCR Section 15131 provides that economic or social information may be included in an EIR, but those economic or social effects shall not be considered as significant effects on the environment. In an EIR, the lead agency can trace the chain of cause and effect from the proposed decision on the project through anticipated economic or social changes resulting from the project that, in turn, lead to physical changes in the environment. Identified potential economic/social changes also can be used to determine the significance of the physical changes on the environment.

Proposition 50 (Water Quality, Supply, and Safe Drinking Water Projects Act)

Proposition 50, approved in 2002, issued \$3.4 billion in general obligation bonds for water projects in California. The bond included competitive grants for water management and water quality improvement projects and drinking water disinfecting projects.

Proposition 84 (Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006)

Proposition 84 amended the Public Resources Code (PRC) to add among other articles, Section 75026 et seq., authorizing the Legislature to appropriate \$1 billion for Integrated Regional Water Management (IRWM) projects that assist local public agencies to meet the long-term water needs of the State, including the delivery of safe drinking water and the protection of water quality and the environment.

10.4.3 METHOD OF ANALYSIS AND SIGNIFICANCE CRITERIA

KWB activities~~The proposed project~~ could be expected to alter conditions affecting local and possibly some out-of-area water supply reliability.

Although the environmental justice approaches contained within Executive Order 12898 and California Government Code Section 65040.12 differ, the underlying intention of both regulations is the fair and equal treatment of all races, cultures, and incomes. In addition, the CEQA Guidelines, Section 15131, provide guidance in determining potential environmental justice impacts, and although the CEQA Guidelines do not recognize an economic or social change as a significant impact, social change may be considered as it relates to determining the significance of a physical change on the environment. The analysis of environmental justice impacts examines the extent to which each alternative would affect a local economy and the different socioeconomic groups participating in the local economy. For the purposes of this chapter, qualitative methods were used to evaluate whether the proposed project would result in fair and equal treatment of minorities and low-income persons in the service areas of the KWB participants~~state water contractors' service areas~~.

Concerns associated with environmental justice relate to minority and low-income populations that could be disproportionately affected by implementation of a proposed project. Environmental justice impacts would be considered potentially significant if implementation of the proposed project would result in direct or cumulative impacts on the natural or physical environment that would result in a proportionately high or adverse impact on a minority or low-income population, considering the population levels or income levels of all affected groups.

10.4.4 IMPACT ANALYSIS

Disadvantaged communities have been identified adjacent to KWB Lands (see Tables 10.4-3 and 10.4-4 above). KWB Lands do not include any populations of minority or low-income populations that could be affected by KWB activities. As discussed in Section 7.1, Surface Water and Groundwater Hydrology,

KWB activities would not result in a net deficit in aquifer volume of stored groundwater. Mitigation Measure 7.1-2 provides mitigation for any impacts to local well levels that could be affected by KWB activities. KWB activities have not reduced the allocation or distribution of water within Kern County in such a way that any minority or low-income communities would be disproportionately adversely affected. By providing a more reliable supply of water, the KWB contributes to sustaining agricultural production in the local areas of KWB participants; some of these agricultural areas could not sustain agricultural production during drought years without a more reliable source of water, such as supplied by the KWB. As discussed in Section 7.6, the KWB may contribute to the change from annual to more permanent crop types throughout Kern County by increasing the reliability of the existing water supply. The direct and indirect impacts from such a change in agricultural practices are not likely to have a disproportional impact on any minority or low-income populations.

Impacts from KWB activities to water quality are discussed under Section 7.2, Surface Water and Groundwater Quality. Specifically, as discussed under Impact 7.2-6, there has been no evidence that KWB activities have degraded water quality at the place of use outside of KWB Lands. This trend is expected to continue in the future.

Therefore, the ~~KWB activities proposed project~~ would not result in unfair or unequal treatment of ~~any socioeconomic group~~ to the identified disadvantaged communities within the regional context described above and would not result in any disproportionately high or adverse impacts on minority or low-income communities.

10.4.4.1 Cumulative Impacts

The ~~KWB activities proposed project~~ would not result in disproportionately high or adverse any environmental justice impacts to minority or low-income communities and, therefore, would not contribute to cumulative impacts.

10.4.4.2 Mitigation Measures

Mitigation Measure 7.1-2 provides mitigation for any impacts to local well levels that could be significantly affected by KWB activities. No other impacts were identified that would result in disproportionately high or adverse impacts to minority or low-income communities. Thus KWB activities proposed project would not result in disproportionately high or adverse impacts to minority or low-income communities. and, thus, no mitigation measures are required.

ENDNOTES

1. Kern County Water Agency. 2011 (November). *Kern Integrated Regional Water Management Plan*, Tulare Lake Basin Portion. Page 312. Available: <http://www.kernirwmp.com/documents.html>.
2. U.S. Census Bureau. 2016. Census Bureau website. Available: http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed January 22, 2016.

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**11. ALTERNATIVES
(NO CHANGE FROM 2007 MONTEREY PLUS DEIR
AND 2010 MONTEREY PLUS FEIR)**

12. CLIMATE CHANGE (NEW)

12. CLIMATE CHANGE (NEW)

12.1 INTRODUCTION

Global climate change is playing an increasingly important role in scientific and policy debates related to water management. The most consequential impacts of climate change on water resources in the United States are likely to occur in the mid-latitudes of the west, where the runoff cycle is largely determined by snow accumulation and subsequent melt patterns. It is well documented that the effects of warmer climates on the timing of runoff in these regions likely will shift a portion of spring and summer runoff to periods earlier in the year. Despite the high degree of regulation in many water supply systems throughout the western United States, the resultant effects of these shifts on runoff seasonality generally are considered to be undesirable, because the amount of water stored in snowpack can be substantial and, under normal (i.e., historical) conditions, this stored water is relied upon to augment low stream flows during the relatively dry summers.¹

Developing evidence indicates global climate change will have a marked effect on water resources in California. More than 150 peer-reviewed scientific articles on climate and water issues in California have been published to date, with many more in preparation, addressing a range of considerations from proposed improvements in the downscaling of general circulation models to understanding how reservoir operations might be adapted to new conditions.² Rising temperatures and sea levels, and changes in hydrological systems are recognized as potential threats to California's economy, public health and environment. In addition to the need for better understanding of the potential implications associated with these changes, it also is recognized that more research is necessary to identify which systems are most vulnerable.³

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect.

Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), ozone (O₃), water vapor, nitrous oxide, and chlorofluorocarbons (CFCs). Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for enhancing the greenhouse effect. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.⁴ In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation.⁵ A byproduct of fossil fuel combustion is CO₂. Methane, a highly potent GHG, results from offgassing associated with agricultural practices and landfills. Processes that absorb and accumulate CO₂, often called CO₂ "sinks," include uptake by vegetation and dissolution into the ocean.

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern,

respectively. If California were a country, it would rank as the 12th to 16th largest emitter of CO₂ in the world. California produced 492 million gross metric tons of carbon dioxide equivalents in 2004.⁶ Carbon dioxide equivalents is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, CH₄ is a much more potent GHG than CO₂. As described in the General Reporting Protocol of the California Climate Action Registry,⁷ one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted. Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state.⁸ This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%).⁹

12.2 POTENTIAL IMPACTS TO ENVIRONMENTAL RESOURCES IN CALIFORNIA RESULTING FROM GLOBAL CLIMATE CHANGE

Since 1895, annual average air temperatures in California have increased by about 1.5 degrees Fahrenheit (°F), with minimum temperatures increasing at a rate almost twice as fast as the increase in maximum temperatures (approximately 2°F and 1°F per century, respectively). In most regions of the State, warming accelerated over the past three decades.¹⁰ The annual minimum temperature averaged over all of California has increased 0.33°F per decade during the period 1920 to 2003, while the average annual maximum temperature has increased 0.1°F per decade.¹¹

With respect to California's water resources, the most significant effects of climate change have been changes to hydrology and sea level rise. Spring snowmelt from the Sierra Nevada to the Sacramento and San Joaquin Rivers has declined over the past century. Lower water volumes of snowmelt runoff indicate warmer winter temperatures. More precipitation falls as rain instead of snow and directly flows from watersheds before spring. As a result, the portion of runoff that occurs between April and June has declined by about 9 percent. In addition to its impacts on the State's water supply, reduced spring runoff can have adverse ecological impacts.^{12,13,14,15} While no overall trend is discernible in statewide snow-water content (the amount of water stored in snowpack), a decreasing trend has been observed in the northern Sierra Nevada, and an increasing trend in the southern Sierra Nevada.¹⁶ However, the average early spring overall snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, a loss of approximate 1.5 million acre-feet (AF) of snowpack storage.¹⁷ These changes have significant implications for water supply, flooding, aquatic ecosystems, energy generation, and recreation throughout the State.

12.3 KERN WATER BANK ANALYSIS

12.3.1 Regulatory Setting

12.3.1.1 Federal

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

On December 7, 2009, the U.S. Environmental Protection Agency (EPA) Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- *Endangerment Finding*: The current and projected concentrations of the six key GHGs—CO₂, CH₄, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- *Cause or Contribute Finding*: The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

United States Department of Energy pump efficiency regulations (10 CFR Part 429 and 431) become effective in the marketplace in 2020.

12.3.1.2 State

Senate Bill 97

Senate Bill (SB) 97, enacted in August 2007, recognizes climate change as a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). On December 30, 2009, the Natural Resources Agency adopted amendments to the CEQA Guidelines, as required by SB 97. These amendments provide guidance to public agencies regarding the analysis and mitigation of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

Senate Bills 1078, 107, and 350, and Executive Orders S-14-08, S-21-09, and B-30-15

SB 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In February 2014, the California Public Utilities Commission reported that California's three largest investor-owned utilities (Pacific Gas & Electric Company [PG&E], Southern California Edison, and San Diego Gas & Electric Company) collectively provided 22.7% of their 2013 retail electricity sales using renewable sources and are continuing progress toward future 2020 requirements.¹⁸

Executive Order S-14-08 expanded the state's Renewable Portfolio Standard (RPS) to 33% renewable power by 2020. Executive Order S-21-09 directs the California Air Resources Board (CARB) under its Assembly Bill (AB) 32 authority to enact regulations to help the state meet its RPS goal of 33% renewable energy by 2020.

The 33%-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new RPS applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Consequently, PG&E, which is the electricity provider for the KWB, must meet the 33% goal by 2020. Further, SB 350 (chapter 547, Statutes 2015) adopted in 2015 increases the RPS to 50% by 2030.

With respect to the state's overall GHG emission reduction goals, Executive Order B-30-15 established a California GHG reduction target of 40% below 1990 levels by 2030. The executive order aligns California's GHG reduction targets with those of leading international governments (the 28-nation European Union, for instance, set the same target for 2030 in October 2014).¹⁹

Department of Water Resources Greenhouse Gas Emissions Reduction Plan

The California Department of Water Resources' (Department's) Climate Action Plan (CAP), Phase 1: Greenhouse Gas Emissions Reduction Plan (GGERP), details the Department's progress and future plans for reducing GHG emissions consistent with the GHG emissions reduction targets established in AB 32, Executive Order S-3-05, and Department-specific policies. The GGERP also outlines the

Department's plan to monitor its progress and to reduce its emissions by over 80 percent below 1990 levels.²⁰

The GGERP provides estimates of historical (going back to 1990), current, and future GHG emissions related to operations (e.g., energy use), construction (e.g., bulldozer), maintenance (e.g., flood protection facility upkeep), and business practices (e.g., Department office building related). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures that the Department will undertake to achieve these goals.

GHG emissions related to State Water Project (SWP) operations account for 98 percent of emissions from Department activities. The overwhelming majority of Department GHG emissions are emitted by non-hydroelectric-generation facilities which are needed to move water through the SWP, causing emissions of between 1.2 million and 4.1 million metric tons of carbon dioxide equivalent per year (MT CO₂e/yr), with an average of 2.4 MT CO₂e/yr during 2007-2010. The GGERP does not take credit for the hydropower that the Department's facilities generate. Emissions related to construction represent the second largest source of GHG emissions from the Department's activities, but are less than 2 percent of the Department's total GHG emissions.

12.3.1.3 Local

In December 2009, the San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted the *Final Staff Report Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act and Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* (SJVAPCD GHG CEQA Guidance). The purpose of the guidance is to streamline the evaluation and significance determination process for projects within SJVAPCD's jurisdiction. The SJVAPCD GHG CEQA Guidance is described further below in Section 12.10.4, Standards of Significance.

12.3.2 Analytical Method

GHG emissions and potential climate change impacts were evaluated quantitatively and qualitatively. The analysis included operations and maintenance (O&M) activities for the KWB from 1995 to 2014 and future activities (i.e., 2015–2030). Construction emissions associated with planned KWB projects were also evaluated.

For construction and typical O&M activities, including operating on-road vehicles and off-road heavy-duty construction equipment, the SJVAPCD-approved model CalEEMod, Version 2013.2.2, and CARB's EMFAC2014 were used to quantify GHG emissions.^{21,22} Assumptions similar to those used in Section 7.7, Air Quality, were also used to quantify GHG emissions from these on- and off-road fuel combustion sources.

The analysis of GHG emissions also evaluated several other emission sources associated with KWB O&M activities: prescribed burns, livestock grazing (enteric fermentation and manure management), and electricity consumption. For prescribed burns and livestock grazing, annual activity levels such as acres burned, number of livestock (i.e., heads), and livestock types (sheep or cattle) were provided by the Kern Water Bank Authority (KWBA). GHG emissions from burns and grazing were quantified using methods and emission factors from CARB's GHG emission inventory.²³

Electricity-related GHG emissions were quantified using PG&E-specific electricity intensity emission factors, which account for the projected changes in PG&E's electricity production portfolio.²⁴ Because these PG&E-specific emission factors include only CO₂ emissions, statewide nitrous oxide and CH₄

emission factors from EPA's eGRID were used to calculate the carbon dioxide equivalent electricity emission factor.²⁵

O&M activities vary from year to year as KWB cycles between periods of recharge (during which KWB consumes relatively little energy) and periods of recovery (during which KWB consumes relatively more energy); GHG emissions associated with O&M activities from 1995 to 2014 were calculated and presented in the analysis on an average annual basis.

12.3.3 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For purposes of this REIR, impacts on GHG emissions would be considered significant if KWB activities would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- conflict substantially with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

12.3.3.1 SJVAPCD GHG CEQA Guidance

As stated in Appendix G, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. SJVAPCD has adopted guidance/policy documents for both land use development projects and stationary sources (the SJVAPCD GHG CEQA Guidance). The SJVAPCD has declined to set numerical standards below which a project would be determined not to have an impact. Instead, it has identified a number of Best Performance Criteria Standards (BPS) where a project's impact significance would be determined on the level of implementation of best performance standards that apply to commonly proposed land use development and/or stationary source projects that would achieve a 29% reduction from business-as-usual (BAU). Projects that implement all BPS are assumed to meet a standard of a GHG reduction of 29% of BAU and would have a less-than-significant impact. Projects that cannot implement all required BPS must demonstrate a 29% reduction from BAU to reduce GHG impacts to a less-than-significant level.²⁶

This method of impact assessment is most applied to residential, commercial, and mixed-use development projects. It would not be directly applicable to a water banking project such as the KWB. Although KWB activities are more similar to a stationary source than a land use development project because of the infrastructure-like service and types of emission sources, it still does not fit into the typical stationary source that the SJVAPCD developed its guidance/policy to evaluate. Therefore, this analysis does not use the SJVAPCD GHG CEQA Guidance to evaluate the GHG emissions from KWB activities.

Water Sector Reductions

Where there is not an established GHG emissions threshold that would apply to projects, the California Air Pollution Control Officers Association suggests that lead agencies identify significance thresholds applicable to a proposed project that are supported by substantial evidence and linked with the AB 32 Climate Change Scoping Plan (Scoping Plan). The recent California Supreme Court ruling on the Newhall Ranch case (*Center for Biological Diversity v. Cal. Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204), found that a statewide percent emission reduction (i.e., 29% below BAU) established by the Scoping Plan does not necessarily equate the same level of reductions for each individual emissions sector. Percent reductions and thresholds should be established specific to the emissions sector or land use type being analyzed as part of the environmental document.

Therefore, the Department considered analyzing and calculating a percent reduction for the water sector to achieve the emission reduction goals of the Scoping Plan. The Scoping Plan includes Measures W-1 to W-6 (described in more detail below) to collectively achieve approximately 4.8 million metric tons of CO₂e reductions in 2020, which would contribute to the State achieving its GHG emission reduction target.²⁷ The Scoping Plan does not assign a specific emission reduction percentage to the water sector as a whole or as to any individual component of the water sector. However, the Department has calculated that this would represent an approximate 13% reduction from the Scoping Plan's baseline emissions levels (i.e., 2002-2004 average) for the entire water sector (i.e., water-related electricity and natural gas emissions). Therefore, by directly targeting the water sector, achieving a 13% reduction from the KWB's 2002-2004 emissions levels could demonstrate that KWB activities achieve their fair-share emission reductions consistent with the emission reductions established for the water sector in the Scoping Plan. However, although this percent reduction (13%) represents a more sector- and project-specific reduction target than the SJVAPCD's statewide 29% reduction, the 4.8 million MT CO₂e reduction is calculated as a sum of all reductions achieved by implementation of Measures W-1 to W-6.

Most of the water sector-related measures would not apply to KWB activities. When only considering the one water-related Scoping Plan measure applicable to KWB (i.e., Measure W-3 projected to achieve 2.0 million MT CO₂e reductions), the percent reduction would be 6%. In addition, the Scoping Plan did not include the water sector emissions reductions in its accounting of reductions needed to achieve the 2020 target, in part because some of the reductions were seen as duplicative of emissions reductions accounted for in other sectors, most notably the energy sector.

Furthermore, KWB began their first water recovery operations in 2001-2002. Therefore, KWB pumps would have been operating near the peak of their efficiency during the 2002-2004 Scoping Plan baseline period. For most other sectors, it is typically expected that a 2002-2004 baseline would be less efficient than current day operations and therefore achieving a reduction beyond those levels would be possible. However, in the case of KWB, it is unlikely that any future operating levels, even with retrofits and rehabilitations for pumps, would operate at an efficiency above the 2002-2004 levels. DWR attempted to determine a baseline efficiency level established by a state, federal, or professional agency with expertise in pump efficiency that could be substituted as a benchmark level of efficiency for 2002-2004 and that reductions could have been measured against. However, the Department was unable to identify a current workable standard.

Thus, considering the uncertainty regarding how the emissions reductions of Measures W-1 to W-6 are applied to particular projects, and baseline level differences between KWB and statewide operations, this analysis does not use this type of percent reduction method to evaluate the GHG emissions from KWB activities.

Thresholds

Several agencies have developed "thresholds" that might be used to determine what level of GHG emissions would constitute as a significance impact. As described above, KWB is a unique project in that it does not fit in as a typical land use development or stationary source project. Nevertheless, to establish additional context when considering the magnitude of GHG emissions associated with KWB activities, this analysis considers the following GHG emissions thresholds developed by other entities:

- The Sacramento Metropolitan Air Quality Management District (SMAQMD) has adopted a threshold of 1,100 MT CO₂e/yr for construction-related GHG emissions.
- Air districts such as the SMAQMD and Bay Area Air Quality Management District (BAAQMD) have adopted GHG thresholds of significance for CEQA projects (i.e., 1,100 MT CO₂/yr) for the purpose of evaluating land use development projects (e.g., residential and commercial).

- Stationary sources that generate greater than 10,000 MT CO₂/yr may be required to participate in the cap-and-trade program through the Western Climate Initiative.²⁸
- The BAAQMD has previously adopted 10,000 MT CO₂/yr as the significance threshold for operational GHG emissions from stationary--source projects.²⁹
- CARB requires operators of selected facility types that generate GHG emissions exceeding 10,000 MT CO₂e/yr to comply with their Mandatory Reporting of Greenhouse Gas Emissions regulation.³⁰
- The Council on Environmental Quality (CEQ) uses 25,000 MT CO₂e/yr as a level of GHG emissions over which a project must perform quantitative analysis of GHG emissions.³¹
- Facilities that generate greater than 25,000 MT CO₂e/yr are required to report their emissions as part of EPA's Mandatory Reporting of Greenhouse Gases.³²

Methods of analysis and thresholds developed for land use development projects are not suitable to evaluate an infrastructure project such as the KWB. Other methods of analysis and thresholds of significance developed for stationary sources and emissions levels for reporting and/or cap-and-trade programs are also not directly applicable to KWB activities. Because of the unique nature of the KWB and its operations, with the exception of construction-related emission thresholds, existing methods of analysis and thresholds of significance (which were all developed for land use development projects and stationary source projects) are not suitable to evaluate its GHG emissions, but can provide context for the level of magnitude of GHG emissions generated.

For construction-related emissions, the SMAQMD annual threshold (i.e., 1,100 MT CO₂e/yr) will be considered the applicable threshold to evaluate KWB's future construction-related GHG emissions in the absence of similar standards. It is expected that construction-related emissions would be substantially similar regardless of the geographic area where they occur.

12.3.3.2 Consistency with Scoping Plan Water Sector Measures

Considering the lack of an appropriate quantitative threshold to evaluate KWB, for the purposes of this analysis, the GHG emissions from KWB activities will be evaluated for consistency with the Scoping Plan's GHG reduction target measures for the water sector. The Scoping Plan identifies six measures that would contribute to water-related GHG reductions required to meet the State's overall emissions reduction target. The water measures are listed below along with a description of their applicability to KWB activities:

- **Measure W-1 (Water Use Efficiency):** KWB activities do not use water, but rather manage water by recharging, storing, recovering, and conveying water for the KWB participants. The efficiency of the KWB's "use" would be through how water is moved through KWB's system, which is addressed in Measure W-3 below. Measure W-1 is not applicable to KWB activities.
- **Measure W-2 (Water Recycling):** KWB activities are not a user of water and therefore recycling KWB water would not be a feasible option. This measure is not applicable to KWB activities.
- **Measure W-3 (Water System Energy Efficiency):** KWB activities move water through recharge, storage, and conveyance (canals and pipelines) facilities, many of which require energy input in the form of electricity to run water pumps. This measure is applicable to KWB activities.
- **Measure W-4 (Water Reuse Urban Runoff):** KWB activities are not similar to land use development projects (i.e., residential or commercial) in an urban, suburban, or rural area. Urban runoff would not be applicable to KWB activities because essentially all KWB Lands

would be permeable, natural surfaces where infiltration can readily occur. This measure is not applicable to KWB activities.

- **Measure W-5 (Increase Renewable Energy Production):** This measure was considered with regard to KWB activities. The KWB HCP/NCCP (Appendix 7.7a) permits specific uses for KWB Lands. With respect to water banking operations, KWBA may install, construct, repair, maintain, and operate water recharge, water recovery, and water conveyance facilities. Solar energy production is not one of the permitted uses. The Settlement Agreement precluded commercial development on the one area allowed for other development activities in the KWB HCP/NCCP. KWBA recently (May 2015) evaluated the feasibility of siting solar energy on the site and concluded that it was not feasible.³³ The results of a study by a private and independent solar design company (California Commercial Solar, Inc.) determined that although solar energy production is possible on the project site, based on the electricity load profile of KWB O&M activities, solar production would not directly offset KWB's energy demands on a consistent basis. In other words, based on the highly variable energy demands of KWB O&M activities (e.g., the main pump station's demand can vary by two magnitudes of order [from 65.8 megawatt-hours (MWh/yr) to 6,148 MWh/yr] between dry and wet years), solar energy production would only offset a portion of peak demands in some years and then would over-produce energy during low years.

Based on the incompatible load profile to primarily use solar energy production on-site, it was concluded that solar energy should not be further pursued on KWB lands. In addition, solar energy production is not an expressly permitted use under the KWB HCP/NCCP, and land used for solar energy production would eliminate existing habitat benefits on those lands and potentially interfere with future recharge pond potential. The construction and operation of a solar facility on KWB Lands, including ancillary facilities such as roads and transmission lines to service the solar facility, could substantially affect the conservation value of the KWB. For these reasons, this measure is not feasible for KWB activities.

- **Measure W-6 (Public Good Charge):** This measure was intended to affect water prices on a statewide level and was not designed to be implemented at an individual water provider level. In addition, this measure's GHG reductions are still listed as "To Be Determined" in the Scoping Plan. This measure is not applicable to KWB activities.

The First Update to the Climate Change Scoping Plan (2014) did not identify additional specific measures applicable to projects like KWB.³⁴ Therefore this analysis will review KWB's consistency with Measure W-3, the applicable water-related emission reduction measure from the Scoping Plan that applies to KWB, as the criterion to evaluate GHG impacts. Quantitative thresholds described above will be provided when possible for informational and contextual purposes.

12.3.4 Impact Analysis

- 12-1 KWB construction and operations/maintenance would generate GHG emissions that could potentially make a considerable contribution to a significant cumulative effect on climate change.**

1996 – 2014

Construction

GHG emissions were generated by exhaust from a variety of sources during KWB facilities construction, such as heavy-duty construction equipment, haul trucks, material delivery trucks, and construction worker vehicles. Like air pollutant emissions, daily GHG emissions would vary depending on the type of construction activities planned for each day. For example, daily GHG emissions would be

greater during construction equipment—intensive phases, such as site grading and excavation, than during less intensive phases, such as material delivery or construction inspections. However, unlike air pollutant emissions, which are evaluated on a local and regional basis, GHG emissions have global effects because of their long atmospheric lifetime and resulting long-term ability to continue contributing to climate change. Therefore, although construction activities and subsequent GHG emissions would be short-term and temporary, total GHG emissions were considered.

The 2007 DEIR and 2010 FEIR evaluated the KWB's construction-related air pollutant emissions during 1996–2003 and into the future. Those analyses determined the impact of construction-related air quality emissions was less than significant. Section 7.7, Air Quality, of this REIR which updates that evaluation, also determines that the impact of air pollutant emissions from planned KWB activities, including the Integrated Regional Water Management (IWRM) program (also called the Kern Water Bank Recharge and Recovery Project) and full build-out, would be less than significant, even when conservatively assuming that construction of all future planned facilities would occur simultaneously in the same year.

Construction emissions for KWB activities planned for future development from 2015 to 2030 are shown in Table 12-2. The types of KWB activities from 1996 through 2014 are essentially the same as those planned for future development. For example, KWB construction activities from 1996 through 2014 included recharge ponds, conveyance pipelines, wells, and maintenance, which are the same components of the planned future projects. The only fundamental difference is that the KWB Canal was previously constructed and no similar facility is proposed in the future. It is reasonable to assume that construction-related GHG emissions from 1996 to 2014 would also be similar in magnitude and intensity to the planned future construction emissions shown in Table 12-2, and would also fall below SMAQMD's construction-related threshold of significance. In addition, KWB-related construction emissions would be substantially less than any of the other contextual thresholds shown for GHG emissions.

Therefore, KWB construction activities did not result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change and this cumulative impact was ***less than significant***.

Mitigation Measures

None required.

Operations and Maintenance

KWBA's 1996–2014 O&M activities included the use of construction equipment and on-road vehicles, electricity consumption for water conveyance, prescribed burns, and livestock grazing. KWBA provided information about construction equipment and on-road vehicle usage for all years from 1996 through 2014, which was used with Kern County—specific emission factors. The earliest year of O&M activities was used to obtain emission factors from CalEEMod and EMFAC, which would conservatively estimate O&M GHG emissions. For electricity-related emissions, PG&E-specific emission factors were used to estimate GHG emissions from KWBA—provided electricity consumption data. Lastly, acres burned and livestock types and heads for each year from 1996 through 2014 were provided by KWBA.

Table 12-1 presents the KWB's annual average O&M GHG emissions from 1996 through 2014.

As shown in Table 12-1, annual average O&M emissions could have been approximately 11,679 MT CO₂e with approximately 92% of operational emissions occurring from electricity consumption. The other O&M activities such as vehicle use, burns, and grazing account for approximately 0.3%, 5.0%,

TABLE 12-1

**KERN WATER BANK OPERATIONS AND MAINTENANCE
ANNUAL AVERAGE GREENHOUSE GAS EMISSIONS, 1996-2014**

Operation and Maintenance Activity	Greenhouse Gas Emissions (MT CO ₂ e/yr) ¹
On- and Off-Road Vehicles	98
Electricity Consumption ²	10,699
Prescribed Burns ¹	581
Grazing ¹	354
Total Annual Average O&M Emissions	11,732

Notes:

MT CO₂e/yr = metric tons of carbon dioxide equivalent per year; O&M = operations and maintenance

¹ Emissions shown for O&M activities represent *annual average* emissions from 1996 through 2014.

² Annual average emissions shown for electricity consumption are from data provided for a 5-year period from 2010 through 2014. Emissions were higher than previous years because 2010-2014 had prolonged periods of recovery; therefore the amount of annual emissions presented above represents a conservative estimate of average annual O&M activities.

Source: Data compiled by AECOM in 2015.

and 3.0% of total emissions, respectively. Annual average O&M emissions would have exceeded the cap-and-trade and stationary source thresholds of 10,000 MT CO₂e, but would have been less than the 25,000 MT CO₂e thresholds from CEQ and the EPA's Mandatory Reporting Rule.

During this time, KWBA was implementing its standard pump stations and water-well maintenance program, which includes pump repair every three to five pumping seasons, or as determined through pump and energy monitoring. This maintenance and monitoring program ensured that pumps were operating at average industry standards to achieve the optimal efficiency of KWB operations and costs. The servicing of pumps under this program minimized electricity consumption (and subsequent GHG emissions) needed for operations.

Therefore, KWB's 1996–2014 operational GHG emissions impact was ***less than significant***.

Mitigation Measures

None required.

2015 – 2030

Construction

Construction emission sources associated with proposed KWB activities from 2015 to 2030 would be similar to those described above for 1996–2014. KWBA provided project-specific information for the proposed IRWM program, which was also used to extrapolate construction parameters for future full buildout, which would have similar facilities. Table 12-2 presents the total GHG emissions associated with all proposed future KWB construction activities.

The KWB's total future construction-related GHG emissions would be approximately 973 MT CO₂e (Table 12-2), which assumes that all proposed future KWB activities would be constructed simultaneously. However, the proposed IRWM program would be constructed first and in separate years than full KWB build-out, such that annual emissions, in reality, would be lower than those shown in Table 12-2. Nevertheless, even if all future KWB construction activities proceeded simultaneously,

TABLE 12-2

**KERN WATER BANK CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS,
2015-2030**

Construction Project	Greenhouse Gas Emissions (MT CO₂e)
IRWM Plan Project ¹	313
Proposed KWB Buildout ²	661
Total Construction GHG Emissions³	973

Notes: GHG = greenhouse gas; MT CO₂e = metric tons of carbon dioxide equivalent

¹ The Integrated Regional Water Management (IRWM) Program Project's construction-related emissions were conservatively modeled assuming that all construction activities would occur in a single year and in the earliest possible construction year (2016).

² Proposed future KWB buildout construction-related emissions were conservatively modeled assuming that all construction activities would occur in a single year and in the earliest possible construction year (2016).

³ Total construction emissions are used to evaluate future KWB facility construction emissions. In reality, these projects would not overlap and would not occur in the same year.

Source: Data compiled by AECOM in 2015.

anticipated construction-related GHG emissions during 2015-2030 would be less than the SMAQMD construction-related GHG threshold and substantially less than the listed contextual thresholds. Thus, construction of all proposed future KWB facilities would result in less construction emissions than any of the potential thresholds for GHG emissions. If added to the O&M annual emissions, the amortized construction emissions would be less than 50 MT CO₂e (less than 0.5%) and would not affect any significance determination for O&M activities.

Therefore, the KWB's 2015–2030 construction-related GHG emissions would not result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change and this cumulative impact would be ***less than significant***.

Mitigation Measures

None required.

Operations and Maintenance

The future O&M activities associated with KWB activities are anticipated to be similar to those shown in Table 12-1. Even with the addition of the KWB IRWM program and proposed future full buildout, O&M activities are not anticipated to increase substantially beyond the previous O&M levels. As shown in Table 12-1, annual 2015 KWB O&M activities would generate approximately 11,732 MT CO₂e, which would slightly exceed all but the highest contextual thresholds of significance presented in Standards of Significance. KWB's annual emissions would not exceed the CEQ quantitative analysis threshold (i.e., 25,000 MT CO₂e/yr) or EPA's Mandatory Reporting threshold (i.e., 25,000 MT CO₂e/yr).

After 2015, it is anticipated that turnover in the vehicle and equipment fleet and improvements to emissions technology would cause emission rates for vehicles and equipment to decrease over time. Electricity-related GHG emissions also would decrease as a result of statewide GHG reduction measures that would reduce electricity-related GHG emissions, such as the Renewable Portfolio Standard (see Senate Bills 1078 and 107 and Executive Orders S-14-08 and S-21-09) and Senate Bill 350. In addition, as PG&E continues to add renewable resources to its electricity portfolio, the GHG intensity of electricity used for O&M activities and overall electricity-related GHG emissions would

decrease. These emissions account for approximately 91% of the KWB's current (2015) annual GHG emissions.

Table 12-3 presents KWB's 2020 and 2030 GHG emissions with incorporation of emission reductions associated with projected vehicle and equipment fleet turnover and increased emissions technology, and required RPS discussed above.

Operation and Maintenance Activity	Year 2020 Emissions (MT CO₂e)¹	Year 2030 Emissions (MT CO₂e)¹
On- and Off-Road Vehicles	81	80
Electricity Consumption	8,977 ²	6,714 ²
Prescribed Burns	581	581
Grazing	354	354
Annual Average Future O&M Emissions	9,993	7,729
Annual Average 2015 O&M Emissions ³	11,732	11,732
Percent Reduction from 2015 Baseline Levels⁴	15%	34%

Notes:

MT CO₂e = metric tons of carbon dioxide equivalent; O&M = operations and maintenance

¹ Emissions shown for 2020 and 2030 assume O&M activity levels of on- and off-road vehicles, electricity consumption, prescribed burns, and grazing stay similar to those in 2015.

² Electricity-related emissions in 2020 assume Pacific Gas & Electric Company (PG&E) achieves both the required 33% Renewable Portfolio Standard (RPS) emissions in 2020, and the required 50% RPS by 2030 as required by Senate Bill 350.

³ Emissions represent current annual average KWB O&M activities' emissions levels as shown in Table 12-1.

⁴ Percent reductions were calculated by comparing the year 2020 and 2030 emissions, which account for planned and projected statewide emissions reductions in the electricity and mobile source sectors, with existing annual average KWB O&M emissions levels. Therefore, calculated percent reductions are actual reductions from an existing 2015 baseline emissions level rather than a projected future (2020 or 2030) business-as-usual level.

Source: Data compiled by AECOM in 2016.

Taking into account currently approved and projected changes in vehicle and equipment fleet, and PG&E's electricity portfolio, GHG emissions associated with KWB's total O&M activities are anticipated to decrease by approximately 15% and 34% in years 2020 and 2030, respectively from 2015 emission levels (Table 12-3). These reductions would occur at a statewide level and would not require KWBA to implement any measures or actions.

In addition, the 2020 and 2030 future mass emission levels would be less than the contextual thresholds shown in the Standards of Significance section above. The only contextual thresholds that would be exceeded in future 2020 and 2030 years would be SMAQMD's construction and operational thresholds, which were developed to evaluate typical land use development projects, and not infrastructure projects such as KWB.

The quantitative analyses presented above provides context for KWB's O&M GHG emissions with respect to currently-established GHG thresholds of significance and the GHG emission reduction percentages achieved in future years. However, as described in Standards of Significance, this analysis will qualitatively evaluate whether KWB activities are consistent with Measure W-3, the applicable water-related emission reduction measure contained in the Scoping Plan. At the time of this analysis,

KWBA performs routine maintenance and monitoring of its pumps for O&M activities. Pumps are prioritized for retrofit, rehabilitation, and replacement as necessary based on monitoring data and current operations and pumping demands. Given that electricity consumption accounts for 91% of KWB's annual GHG emissions, purchasing electricity accounts for a large majority of KWB operational costs. Therefore, KWBA has an inherent financial incentive to operate pumps at an efficient level.

Existing KWBA monitoring and maintenance actions have achieved sizeable energy savings through pump retrofits and rehabilitations. In 2015 and 2011, KWBA retrofit and rehabilitation actions resulted in annual energy savings of approximately 3,546 MWh and 1,792 MWh, respectively.^{35,36,37} These achieved energy savings in 2015 and 2011 represent approximately 6.4% and 3.2%, respectively, of KWB's total annual average electricity consumption. Furthermore, these energy savings resulted in annual emission reductions of approximately 633 MT CO₂e and 322 MT CO₂e in years 2015 and 2011, respectively.

Although KWB has historically and currently performs pump efficiency actions to monitor and maintain pumps at optimal working conditions, there is no formal mechanism to require these pump efficiency actions. Therefore, consistency with Scoping Plan Measure W-3 (Water System Energy Efficiency) cannot be tracked as part of an official plan or program approved by the KWBA Board of Directors. Thus, for the purposes of a conservative analysis, it is assumed that without a formal pump efficiency plan, the KWBA might not be consistent with the applicable water-related Scoping Plan measures (i.e., Measure W-3). KWB's 2015–2030 O&M GHG emissions could result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change and this cumulative impact could be **potentially significant**.

Mitigation Measures

As shown above in Table 12-3, accounting for statewide reduction measures that would occur independently of KWB operations, O&M activities would achieve an approximate 15% and 34% reduction from 2015 levels by 2020 and 2030, respectively. In addition, these emissions levels would be below all of the contextual thresholds of significance except for SMAQMD's construction and operational GHG thresholds developed for land use development projects. Furthermore, with implementation of Mitigation Measure 12-1, a formal Pump System Energy Efficiency Plan (PSEEP) would ensure that O&M activities comply with the Scoping Plan's Measure W-3. Considering that statewide reduction measures would continue to reduce KWB's O&M GHG emissions, that future 2020 and 2030 emission levels would be less than most contextual thresholds, and that KWBA has adopted a formal pump efficiency program as part of Mitigation Measure 12-1, KWB's future O&M GHG emissions would not result in a cumulatively considerable incremental contribution to the significant cumulative impact on climate change.

KWBA is obligated to carry out the measures in Mitigation Measure 12-1 (see Section 7.0.4.3.2, 2016 KWBA Resolution). Therefore, impacts from KWB activities with regard to the cumulative impact on GHG emissions are **less than significant, with mitigation**.

- 12-1** *KWBA will implement the following measures (2016 KWBA Resolution, Appendix 7.6b):*
- a) **Pump Efficiency Monitoring:** *KWBA will conduct pump efficiency monitoring to ensure that all KWB pumps are monitored and evaluated at regular intervals during recovery periods.*
 - i. *Daily Pump Efficiency Monitoring: Pumps shall be monitored daily for their total water volume pumped (acre-feet [AF]) and electricity consumption (kilowatt-hours [kWh]), which will be used to calculate a daily energy efficiency value (i.e., kWh/AF).*

- ii. *Pump Efficiency Software: Metro or an equivalent water system management program will be used to provide up-to-date and streamlined methods to analyze KWB's individual pump and total system efficiency.*
- b) **Pump Rehabilitation, Retrofits, and Replacement:** *KWBA shall use data from the Pump Efficiency Monitoring component to strategically and actively rehabilitate, retrofit, and/or replace pumps as needed during recovery periods.*
- i. *Pump Prioritization and Testing: Pump rehabilitation, retrofit, and replacement shall be prioritized by accounting for the relative efficiency of each pump with respect to the total pump system and water volume pumped through each pump. Data obtained from the Pump Efficiency Monitoring component shall be used to prioritize which pumps will be rehabilitated, retrofitted, and/or replaced. In addition efficiency testing by external entities if available (e.g., pump company, Pacific Gas & Electric Company [PG&E]) or other similar analysis will also be used for the prioritization process.*
 - ii. *Schedule: KWBA shall rehabilitate, retrofit, and/or replace pumps/wells at the earliest possible time without substantially disturbing ongoing O&M activities, but at a minimum will rehabilitate, retrofit, and/or replace at least an annual average of 5 pumps per year during a prolonged recovery period such as occurred between 2013 and 2016.*
- c) **Reporting:** *KWBA will maintain a quarterly and annual reporting program that will be publicly available online. Annual reports will cover calendar years and be posted online by March 30 to cover the previous year. Quarterly reports will be posted online within 30 days of the end of each calendar quarter. The annual and quarterly reports will include, but are not limited to, the following components:*
- i. *KWB O&M Totals: Total quarterly electricity consumption for recovery pumping activities along with total acre-feet recovered shall be provided online. A running total of the annual electricity consumption and acre-feet recovered by quarter shall also be provided.*
 - ii. *Pump Efficiency: A summary of the pump efficiency (kWh/acre-feet) for each of KWB's pumps will be provided quarterly. Similar to the KWB O&M Totals, a running annual average efficiency for each pump shall be provided. These data shall be used to identify the 5 pumps per year that will be rehabilitated, retrofitted, or replaced. If a pump/well is adjusted for depth, notes shall be made within the reports to explain these changes in pump efficiency.*
 - iii. *Electricity Efficiency Actions: Each report should include actions taken in the previous quarter to rehabilitate, retrofit, and/or replace pumps. Any other energy efficiency measures taken will be reported. When information is available from PG&E's Advanced Pumping Efficiency Program or other similar programs, annual electricity savings from these actions shall be included in the quarterly and annual reports to clearly show the electricity savings associated with rehabilitation, retrofit, and/or replacement actions. If annual energy savings cannot be determined through pre- and post-pump improvement testing, KWBA shall report the empirical annual energy savings (kWh/year) from these improvements in its annual reports.*

- iv. *Identifying Next Steps: Each annual report will include the list of 5 or more pumps planned to be evaluated for potential rehabilitation, retrofit, or replacement during that year. If all five of the least efficient pumps are not scheduled for rehabilitation, retrofit, and/or replacement in the coming year, the annual report shall explain what KWB operation requires the pump to remain in service that year.*
- d) **Pump Compliance:** *KWBA will only purchase new pumps that comply with United States Department of Energy pump efficiency regulations (10 CFR Part 429 and 431) when those regulations become effective in the marketplace in 2020.*
- e) **Future Increases in Technology and Emissions Standards:** *KWBA shall actively consider replacing older pumps with new pumps with increased efficiency technology. All future requirements for pumps at the federal, state, and/or local level shall be complied with.*

12-2 Construction and operations/maintenance of the existing and proposed KWB activities could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions.

Climate action plans developed to reduce GHG emissions have not considered projects such as the KWB. The KWB is not a typical stationary or land use development project with residential and commercial land uses. Rather, the KWB is a water infrastructure project that would provide water management facilities to recharge, store, pump, and distribute water. Therefore, typical climate action plans that focus on stationary sources, land use development, or transportation would not be applicable to KWB activities.

However, the quantitative emission reductions for the water sector established in the Scoping Plan have been used in Impact 12-1 to evaluate the KWB's operational GHG emissions. As shown above in Table 12-3, KWB activities would achieve fair-share emission reductions for the water sector. In addition, with respect to the Scoping Plan's GHG emission reduction strategies for the water sector, through implementation of Mitigation Measure 12-1, KWB activities would comply with the applicable Scoping Plan Measure W-3.

In addition to KWB's consistency with the Scoping Plan on a quantitative and qualitative basis, KWB activities would include operating existing facilities, and constructing and operating new planned facilities, to store groundwater during surplus years, which would then be recovered and conveyed to KWBA participants as needed. Although as shown in Tables 12-1 and 12-3, KWB's O&M activities require electricity to store, pump, and convey water, these water management energy needs would be less than those associated with other water supply alternatives such as desalination of sea water or brackish groundwater.³⁸ Therefore, KWB activities would manage and supply water at a lower energy intensity than potential future water supply systems and could help avoid potential increased energy consumption and subsequent GHG emissions.

Therefore, existing and proposed KWB activities have not and would not conflict with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions and impacts would be **less than significant**.

Mitigation Measures

None required.

12.3.5 KWB's Role in Adapting to Climate Change

The end users of KWB water are susceptible to the effects of climate change, including decreasing precipitation rates, decreasing snowpack, and higher air temperatures which can lead to loss of water supply reliability. The KWBA constructs, operates, and maintains KWB infrastructure in Kern County to recharge and store water supply during wet years to supplement water demands during dry years. This operation helps to manage water supply variability and provide higher reliability for agricultural and/or urban water supplies.

Safeguarding California: Reducing Climate Risks³⁹ provides the high level strategic plan for how the State of California is planning and will continue to plan for and address the detrimental effects of climate change. Climate change projections indicate that California's precipitation may become even more erratic in the future—delivering very high volumes of precipitation in short periods of time, with longer and hotter dry periods in between. The water sector section of the Plan lays out the actions needed to prepare for climate risks to California water resources. Those actions include at least three strategies that are supported by the continued operation of the KWB:

- support regional groundwater management for drought resiliency,
- diversify local supplies and increase water use efficiency, and
- prepare California for hotter and dryer conditions and improve water storage capacity.

KWB activities would support these strategies by maintaining existing storage facilities and constructing new recharge and storage facilities (recharge ponds and wells) that increase the potential to store water during times of the year when water is available. Existing and additional water storage provides additional water supply during periods of drought and water shortage that are expected to increase in the future with climate change.

KWB's recharge and conservation facilities help stabilize water supply reliability in areas of critical agricultural and urban needs where water supply is limited but demand is high. KWB activities, therefore, help to counteract the detrimental impacts of climate change on water supply reliability. KWB activities would thus help enable the State's economy and populations to continue operating during droughts and impacts on water supply.

ENDNOTES

1. VanRheenen, N. T., A. W. Wood, R. N. Palmer, and D. P. Lettenmaier. 2004. Potential Implications of PCM Climate Change Scenarios for Sacramento–San Joaquin River Basin Hydrology and Water Resources. *Climatic Change* 62:257–281.
2. Kiparsky, M., and P. H. Gleick. 2003. *Climate Change and California Water Resources: A Survey and Summary of the Literature. The California Water Plan, Volume 4 – Reference Guide*. Oakland, CA: Pacific Institute for Studies in Development, Environment, and Security.
3. U.S. Climate Change Research Program. Understand Climate Change. Available: <http://www.globalchange.gov>. Accessed April 21, 2016.
4. California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA.
5. California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA.
6. California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Sacramento, CA. Publication CEC-600-2006-013-SF. Sacramento, CA.
7. California Climate Action Registry. 2009. General Reporting Protocol Version 3.1. Los Angeles, CA.
8. California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA.
9. California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA.
10. California Environmental Protection Agency. 2013 (August). *Indicators of Climate Change in California*. Office of Environmental Health Hazard Assessment.
11. Moser, S., G. Franco, S. Pittiglio, W. Chou, and D. Cayan. 2009. *The Future is Now: An Update on Climate Change Science Impacts and Response Option for California*. California Energy Commission Public Interest Energy Research Program, California Climate Change Center. CEC-500-2008-071.
12. California Environmental Protection Agency. 2013 (August). *Indicators of Climate Change in California*. Office of Environmental Health Hazard Assessment.
13. Mote, P., A. Hamlet, M. Clark, and D. Lettenmaier. 2005. Declining Mountain Snowpack in Western North America. *American Meteorological Society*, January 2005.
14. Knowles, N., M. Dettinger, and D. Cayan. 2006. Trends in Snowfall versus Rainfall in the Western United States. *Journal of Climate* 19(18):4545–4559.

15. Kapnick, S., and A. Hall. 2009. *Observed Changes in the Sierra Nevada Snowpack: Potential Causes and Concerns*. Draft Paper. California Climate Change Center. CEC-500-2009-016-D.
16. California Environmental Protection Agency. 2013 (August). *Indicators of Climate Change in California*. Office of Environmental Health Hazard Assessment.
17. California Department of Water Resources. 2008 (October). *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. Available: <http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf>.
18. California Public Utilities Commission. 2014 (February). *Biennial RPS Program Update. In Compliance with Public Utilities Code Section 399.19*.
19. Office of the Governor. 2015 (April 29). New California Goal Aims to Reduce Emissions 40 Percent Below 1990 Levels by 2030. Available: <https://www.gov.ca.gov/news.php?id=18938>. Accessed April 18, 2016.
20. California Department of Water Resources. 2012 (May). *Climate Action Plan, Phase 1: Greenhouse Gas Emissions Reduction Plan*. CEQA Climate Change Committee.
21. California Air Pollution Control Officers Association. 2016. CalEEMod. Available: <http://www.caleemod.com>. Accessed April 18, 2016.
22. California Air Resources Board. 2016. EMFAC2014. Available: <http://www.arb.ca.gov/msei/categories.htm>. Last updated February 3, 2016. Accessed April 18, 2016.
23. California Air Resources Board. 2015. Documentation of California's 2000–2013 GHG Inventory—Index. Available: http://www.arb.ca.gov/cc/inventory/doc/doc_index.php. Accessed December 10, 2015.
24. Pacific Gas and Electric Company. 2015. Greenhouse Gas Emission Factors. Available: https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf. Accessed December 10, 2015.
25. U.S. Environmental Protection Agency. 2015. eGRID 2012 Summary Tables. Available: http://www.epa.gov/sites/production/files/2015-10/documents/egrid2012_summarytables_0.pdf. Accessed December 10, 2015.
26. San Joaquin Valley Air Pollution Control District. 2009. Guidance for Valley Land Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA. Available: <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>. Accessed February 9, 2016.
27. California Air Resources Board. 2008. Climate Change Scoping Plan. Available: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed February 20, 2016.
28. Western Climate Initiative. 2009 (January 6). *Background Document and Progress Report for Essential Requirements of Mandatory Reporting for the Western Climate Initiative*, Third Draft. Available:

- http://www.westernclimateinitiative.org/dmdocuments/mandatory_reporting_3rd_draft_010609.74.pdf. Accessed March 13, 2012.
29. Bay Area Air Quality Management District. 2011 (May). *CEQA Air Quality Guidelines*. Available: http://baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx. Accessed March 12, 2012.
 30. California Air Resources Board. 2015. Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Available: <http://www.arb.ca.gov/regact/2014/ghg2014/mrrfroal.pdf>. Accessed March 3, 2016.
 31. Council on Environmental Quality. 2014. *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*. Available: https://www.whitehouse.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance_searchable.pdf. Accessed February 29, 2016.
 32. U.S. Environmental Protection Agency. 2009. *Federal Register*, 40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule. Available: <http://www.epa.gov/sites/production/files/2014-09/documents/ghg-mrr-finalpreamble.pdf>. Accessed February 2, 2016.
 33. California Commercial Solar, Inc. 2015. CalCom Solar Proposal for Kern Water Bank Authority. Visalia, CA.
 34. California Air Resources Board. 2015. *First Update to the Climate Change Scoping Plan*. Available: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed April 4, 2016.
 35. Lincus Incorporated for Pacific Gas and Electric Company (PG&E). 2015 (October). *Kern Water Bank Authority (WISE-076) Pump Efficiency Improvement Installation Report*. Emeryville, CA.
 36. Lincus Incorporated for Pacific Gas and Electric Company. 2015 (October). *Kern Water Bank Authority (WISE-035-01) Pump Efficiency Improvement Installation Report*. Emeryville, CA.
 37. Lincus Incorporated for Pacific Gas and Electric Company (PG&E). 2016 (February). *Kern Water Bank Authority (WISE-035-02-A) Pump Efficiency Improvement Installation Report*. Emeryville, CA.
 38. Pacific Institute. 2013. *Desalination and Energy Use...Should We Pass the Salt?*. Available: <http://pacinst.org/desal-and-energy-use-should-we-pass-the-salt/>. Accessed March 1, 2016.
 39. California Natural Resources Agency. 2014. *Safeguarding California: Reducing Climate Risks*.

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13. REFERENCES

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DOCUMENTS REFERENCED

Applied Environmental Microbiology 66(7) 2000 (July).

Aspen Environmental Consultants for California Department of Conservation. 2014 (October). *Draft Environmental Impact Report for Analysis of Oil and Gas Well Stimulation Treatments in California*.

Bartow, J. A. 1991. *The Cenozoic Evolution of the San Joaquin Valley, California*. U.S. Geological Survey Professional Paper 1501. Washington, DC.

Bay Area Air Quality Management District. 2011. *CEQA Air Quality Guidelines*. Available: http://baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx. Accessed March 12, 2012.

California Air Pollution Control Officers Association. 2016. CalEEMod. Available: <http://www.caleemod.com>. Accessed April 18, 2016.

California Air Resources Board. 2003. HARP User Guide, Appendix K. Available: <http://www.arb.ca.gov/toxics/harp/docs/userguide/appendixk.pdf>. Accessed January 7, 2016.

California Air Resources Board. 2008. Climate Change Scoping Plan. Available: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed February 20, 2016.

California Air Resources Board. 2015. Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Available: <http://www.arb.ca.gov/regact/2014/ghg2014/mrrfroal.pdf>. Accessed March 3, 2016.

California Air Resources Board. 2015. Documentation of California's 2000–2013 GHG Inventory—Index. Available: http://www.arb.ca.gov/cc/inventory/doc/doc_index.php. Accessed December 10, 2015.

California Air Resources Board. 2015. *First Update to the Climate Change Scoping Plan*. Available: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed April 4, 2016.

California Air Resources Board. 2016. EMFAC2014. Available: <http://www.arb.ca.gov/msei/categories.htm>. Last updated February 3, 2016. Accessed April 18, 2016.

California Climate Action Registry. 2006. General Reporting Protocol.

California Commercial Solar, Inc. 2015. CalCom Solar Proposal for Kern Water Bank Authority. Visalia, CA.

- California Department of Conservation. 1998 (June). *Farmland Conversion Report, 1994 to 1996*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation. 2006. *Kern County Farmland 2004–2006 Conversion Report*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation. 2008. *California Farmland Conversion Report, 2004–2006 Conversion*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation. 2012. *Kern County Farmland 2010–2012 Conversion Report*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation. 2012. *2012 Kern County Field. Farmland Mapping and Monitoring Program*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation. 2014 (April). *California Farmland Conversion Report 2008–2010*. Available: <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>. Accessed May 28, 2015.
- California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 March). *District 4 Oil and Gas Well Data*. Available: <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>. Accessed March 5, 2015.
- California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2015 March). *District 4 Oil and Gas Well Data: API No. 029-20679*. Available: http://owr.conservation.ca.gov/WellRecord/029/02920679/02920679_DATA_2015-07-23.pdf. Accessed March 5, 2015.
- California Department of Fish and Wildlife. 2015. *California Fish Species of Special Concern, 3rd Edition, Kern Brook Lamprey*. Available: <https://www.wildlife.ca.gov/Conservation/Fishes/Special-Concern>.
- California Department of Fish and Wildlife. 2015. *California Fish Species of Special Concern, 3rd Edition, Kern River Rainbow Trout*. Available: <https://www.wildlife.ca.gov/Conservation/Fishes/Special-Concern>.
- California Department of Fish and Wildlife. 2015. *Results of electronic database search and GIS data for sensitive species occurrences for California in polygon format. Version 5. Biogeographic Data Branch*. Available: <https://map.dfg.ca.gov/rarefind/view/RareFind.aspx>. Accessed May 13, 2015.
- California Department of Forestry and Fire Protection. 2007. *Draft Fire Hazard Safety Zones in LRA, 2007*.
- California Department of Forestry and Fire Protection. 2012 (August). *State Responsibility Areas for Fire Protection: Kern County*. Available: http://frap.fire.ca.gov/data/frapgismaps/sra11_2/sramap.15.pdf. Accessed April 8, 2016.

- California Department of Forestry and Fire Protection. 2015. Wildland Hazard & Building Codes. Available: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_fags.php#sra01. Accessed May 26, 2015.
- California Department of Parks and Recreation. 2015. Tule Elk State Natural Reserve. Available: http://www.parks.ca.gov/?page_id=584. Accessed April 22 and May 21, 2015.
- California Department of Resources Recycling and Recovery. 2015. Facility/Site Summary Details: Shafter-Wasco Recycling & Sanitary LF (15-AA-0057). Available: <http://www.calrecycle.ca.gov/SWFacilities/Directory/15-AA-0057/Detail/>. Accessed November 25, 2015.
- California Department of Toxic Substances Control and Kern Water Bank. 2000 (March 3). DTSC and KWB, Certification of the KWBA, Buena Vista Ranch and HSST Parcel.
- California Department of Transportation. 2011 (May). Paleontological Resources: Paleontological Identification and Evaluation Report and Mitigation Plan for State Route 178 Widening Project. Prepared by Cogstone Resource Management, Inc. Orange, CA.
- California Department of Water Resources. No date. Online water quality database.
- California Department of Water Resources. 1986. *Draft Environmental Impact Report on Kern Water Bank Project*.
- California Department of Water Resources. 1986 (December). *Final Environmental Impact Report: Artificial Recharge, Storage, and Overdraft Correction Program, Kern County, California*. Sacramento, CA.
- California Department of Water Resources. 1987 (April). *Kern River Fan Element Kern Water Bank. Preliminary Technical Report*. Sacramento, CA.
- California Department of Water Resources. 1990 (December). *Kern Water Bank First Stage Kern Fan Element Feasibility Report*. Sacramento, CA.
- California Department of Water Resources. 1990 (December). *Kern Water Bank (KWB) First Stage Kern Fan Element Draft Supplemental Environmental Impact Report*. Sacramento, CA.
- California Department of Water Resources. 2003. *California Groundwater*. Bulletin 118.
- California Department of Water Resources. 2008 (October). *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. Available: <http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf>.
- California Department of Water Resources. 2010. Lines of Equal Depth to Water in Wells, Unconfined Aquifer. Available: http://www.water.ca.gov/groundwater/data_and_monitoring/south_central_region/GroundwaterLevel/gw_level_monitoring.cfm. Last updated September 2014. Accessed March 14, 2015.
- California Department of Water Resources. 2012 (May). *Climate Action Plan, Phase 1: Greenhouse Gas Emissions Reduction Plan*. CEQA Climate Change Committee.
- California Department of Water Resources. 2013. *The State Water Project Delivery Reliability Report 2013*. Bay-Delta Office, Sacramento, CA.

- California Department of Water Resources. 2014 (December). *Water Quality Assessment of Non-Project Turn-ins to the California Aqueduct, 2013. Technical Memorandum Report*. Sacramento, CA.
- California Department of Water Resources. 2016. *Development of DWR Kern Water Bank Model: Model Review, Selection, and Enhancements*.
- California Department of Water Resources and Kern Water Bank Authority. 1996 (March). *Wrap Up Report*.
- California Energy Commission. 2006 (December). *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Staff Final Report. Publication CEC-600-2006-013-SF. Sacramento, CA.
- California Energy Commission Energy Consumption Data Management System, Electricity Consumption by County, 2014.
- California Environmental Protection Agency. 2013 (August). *Indicators of Climate Change in California*. Office of Environmental Health Hazard Assessment.
- California Highway Patrol. 2015. Central Division. Available: <https://www.chp.ca.gov/Find-an-Office/Central-Division>. Accessed November 25, 2015.
- California Legislation. Sustainable Groundwater Management Act, and Related Statutory Provisions from SB 1168 (Pavley), AB 1739 (Dickinson), and SB 1319 (Pavley) as Chaptered. September 29, 2014. Available: http://opr.ca.gov/docs/2014_Sustainable_Groundwater_Management_Legislation_092914.pdf. Accessed May 27, 2015.
- California Native Plant Society. 2001. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (sixth edition)*, Sacramento, CA.
- California Natural Resources Agency. 2014. *Safeguarding California: Reducing Climate Risks*.
- California Public Utilities Commission. 2014 (February). *Biennial RPS Program Update. In Compliance with Public Utilities Code Section 399.19*.
- Castle, R. O., J. P. Church, R. F. Yerkes, and J. C. Manning. 1983. *Historical Surface Deformation near Oildale, California*. U.S. Geological Survey Professional Paper 1245. U.S. Government Printing Office. Washington, DC.
- Central Coast Water Authority. 1995 (May). *Draft Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA.
- Central Coast Water Authority. 1995 (October). *Final Program Environmental Impact Report, Implementation of the Monterey Agreement Statement of Principles by the State Water Contractors and the State of California, Department of Water Resources for Potential Amendments to the State Water Supply Contracts*. State Clearinghouse No. 95023035. Buellton, CA. Prepared by Science Applications International Corporation, Santa Barbara, CA.

- Central Valley Regional Water Quality Control Board. 2004 (January). *Water Quality Control Plan for the Tulare Lake Basin*. Second Edition.
- Central Valley Regional Water Quality Control Board. 2008 (November 14). No Further Action Letter, Former Rio Bravo Pump Station.
- Central Valley Regional Water Quality Control Board. 2008 (June 12). General Order No. R5- 2008-081, NPDES No. CAG995001. Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters.
- Central Valley Regional Water Quality Control Board. 2010. *2010 Update of California's 303(d) List of Impaired Water Bodies*. Available: http://www.swrcb.ca.gov/losangeles/water_issues/programs/303d_list.shtml. Accessed June 1, 2015.
- Central Valley Regional Water Quality Control Board. 2015 (August 31). Cleanup and Abatement Order No. R5-2015-0730, Grayson Services, Inc. KCL-E Lease, Canal Oil Field, Bakersfield, CA.
- City of Bakersfield. 2015. Bakersfield Municipal Code, Noise Ordinance. Section 9.22.050, "Noise during Construction."
- City of Bakersfield and Kern County. 1985 (July). *The Kern River Plan Element: An Integral Part of the City of Bakersfield General Plan and the Kern County General Plan*. Bakersfield, CA.
- City of Bakersfield and Kern County. 2002 (December). *Metropolitan Bakersfield General Plan*. Chapter XI, Parks Element. Adopted by the City of Bakersfield on December 11, 2002, and effective February 26, 2003, as per Resolution No. 222-02. Bakersfield, CA.
- City of Bakersfield Recreation & Parks. 2015. Kern River Parkway & Bakersfield's Bicycle Trails. Available: http://www.bakersfieldcity.us/recreation/Kern_River_Parkway.htm. Accessed April 22, 2015.
- City of Bakersfield Recreation & Parks. 2015. Kern River Parkway Trail map. Available: http://www.bakersfieldcity.us/recreation/pdfs/2013_Parkway_Trail.pdf. Accessed April 22, 2015.
- City of Bakersfield Recreation & Parks. 2015. Kern River Parkway & Bakersfield's Bicycle Trails. Available: http://www.bakersfieldcity.us/recreation/Kern_River_Parkway.htm. Accessed April 22, 2015.
- City of Los Angeles. 2015. Green Acres Farm. Available: http://www.lacitysan.org/biosolidsems/managing_biosolids/land_application.htm. Accessed May 21, 2015.
- Conesta Rovers & Associates. 2013 (August 12). *Well Destruction Report, Chevron Wait-Midway Pipeline*.
- Council on Environmental Quality. 2014. *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*. Available: https://www.whitehouse.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance_searchable.pdf. Accessed February 29, 2016.
- Croft, M. G. 1972. *Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, California*. U.S. Geological Survey Water-Supply Paper 1999-H. Washington, DC.

- Eastern Kern Air Pollution Control District. 1999. Guidelines for Implementation of CEQA. Available: http://www.kernair.org/Documents/CEQA/CEQA_Guidelines%20&%20Charts.pdf. Accessed January 20, 2016.
- Environmental Data Resources, Inc. 2015 (April). EDR Data Map Area Study, Kern Water Bank. Report Inquiry Number 4270495.5. Shelton, CT.
- EnviroTech Consultants, Inc. 2014 (August). *Groundwater Monitoring Plan for North Cole's Levee Well Stimulation Treatment*, Central Resources, Inc. Bakersfield, CA.
- Erlandson, J. M. 1997. "The Middle Holocene along the California Coast." In J. E. Arnold, ed., *Archaeology of the California Coast during the Middle Holocene*, pages 1–10. Los Angeles: Regents of the University of California.
- Federal Highway Administration. 1980 (September). *Highway Noise Fundamentals*. United States Department of Transportation.
- Federal Railroad Administration. 1998 (December). *High-Speed Ground Transportation Noise and Vibration Impact Assessment*.
- Flint, S. A. 1987 (November 23). *Preliminary Assessment—Continental Carbon Co.* California Department of Health Services, Toxic Substances Control Division.
- Fredrickson, D. A., and J. Grossman. 1966. *Radiocarbon Dating of an Early Site at Buena Vista Lake, California*. Paper presented at the Annual meeting of the Society for American Archaeology, Reno, NV.
- Geomatrix Environmental Consultants. 1996 (January 18). *Soil Assessment Results*, Rio Bravo–Estero Pipeline.
- Hartzell, L. 1992. *Hunter-Gatherer Adaptive Strategies and Lacustrine Environments in the Buena Vista Lake Basin, Kern County, California*. Unpublished dissertation, University of California, Davis.
- Insight Environmental Consultants. 2015 (October). *Focused Air Quality Analysis Agricultural-Related Emissions within the Kern Water Bank Service Area*. Bakersfield, CA.
- Ireland, R. L., J. F. Poland, and F. S. Riley. 1984. *Land Subsidence in the San Joaquin Valley, California, as of 1980*. U.S. Geological Survey Professional Paper 437-I. Prepared in cooperation with the California Department of Water Resources. Washington, DC: U.S. Government Printing Office.
- Jennings, C. W. 1994. Fault Activity Map of California and Adjacent Areas. Geologic Data Map No. 6. Sacramento: California Division of Mines and Geology.
- Kapnick, S., and A. Hall. 2009. *Observed Changes in the Sierra Nevada Snowpack: Potential Causes and Concerns*. Draft Paper. California Climate Change Center. CEC-500-2009-016-D.
- Kennedy/Jenks Consultants. 2011 (November). *Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan Final Update*. Prepared for Kern County Water Agency.
- Kern Council of Governments. 2014 (June 19). *2014 Regional Transportation Plan/Sustainable Communities Strategy*. Available: http://www.kerncoq.org/images/docs/rtp/2014_RTP.pdf. Accessed May 7, 2015.

- Kern County. 1982 (April 15). *Kern County General Plan*. Land Use, Open Space, & Conservation Element, Taft Priority Area Land Use Map. Adopted by the Kern County Board of Supervisors March 1, 1982, as part of the *Kern County General Plan*, Resolution No. 820177.
- Kern County. 1982 (April 15). *Kern County General Plan*. Land Use, Open Space, & Conservation Element, Kern County, Western Section Land Use Map. Adopted by the Kern County Board of Supervisors March 1, 1982, as part of the *Kern County General Plan*, Resolution No. 820177.
- Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*, Circulation Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007. Available: <http://www.bakersfieldcity.us/weblink7/Browse.aspx?startid=602140&dbid=0>. Accessed May 6, 2015.
- Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Metropolitan Area)*, Land Use Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007.
- Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Planning Area)*, Noise Element. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007.
- Kern County. 2007 (December 11). *Metropolitan Bakersfield General Plan (Unincorporated Metropolitan Area)*, Table of Contents. Adopted by Kern County Board of Supervisors December 3, 2002; updated through December 11, 2007.
- Kern County. 2014 (October). *Operational Hazardous Materials Plan*. Bakersfield, CA.
- Kern County Department of Agriculture. 1995. *Kern County Crop Report—1995*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
- Kern County Department of Agriculture and Measurement Standards. 1995. *Kern County Crop Report—1995*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
- Kern County Department of Agriculture and Measurement Standards. 1996. *1996 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
- Kern County Department of Agriculture and Measurement Standards. 2014. *2014 Kern County Agricultural Crop Report*. Available: <http://www.kernag.com/caap/crop-reports/crop-reports.asp>. Accessed May 28, 2015.
- Kern County Department of Public Health. 2015. Kern County Valley Fever Cases by Selected Measure. Available: <http://kerncountyvalleyfever.com/cases-in-kern-county-2/>. Accessed December 2, 2015.
- Kern County Fire Department. 2015. KCFD Facts. Available: <http://www.kerncountyfire.org/about-us.html>. Accessed November 25, 2015.
- Kern County Parks and Recreation. 2015. Map of Buena Vista Aquatic Recreation Area. Available: <http://www.co.kern.ca.us/parks/pdf/bv-map.pdf>. Accessed April 20, 2015.

- Kern County Planning Department. 1989 (December). *Kern County General Plan*, Noise Element. Bakersfield, CA.
- Kern County Planning Department. 2009 (September 22). *Kern County General Plan*, Circulation Element. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009. Available: <http://www.co.kern.ca.us/planning/pdfs/kcgp/KCGPChp2Circulation.pdf>. Accessed May 6 and 21, 2015.
- Kern County Planning Department. 2009 (September 22). *Kern County General Plan*, Land Use, Open Space, and Conservation Element. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009.
- Kern County Planning Department. 2009 (September 22). *Kern County General Plan*, Noise Element. Originally adopted by Kern County Board of Supervisors June 15, 2004; updated through September 22, 2009.
- Kern County Public Health Services Department. 2008. *Fight the Bite! Protect Yourself and Your Family from West Nile Virus!*
- Kern County Public Health Services Department. 2015. West Nile Virus. <http://kernpublichealth.com/west-nile-virus/>. Accessed December 10, 2015.
- Kern County Raceway Park. 2016. About. Available: <http://kernraceway.com/about.htm>. Accessed February 23, 2016.
- Kern County Sheriff's Office. 2015. Buttonwillow Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Buttonwillow/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Sheriff's Office. 2015. Lamont Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Lamont/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Sheriff's Office. 2015. Rosedale Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Rosedale/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Sheriff's Office. 2015. Rural Crime. Available: <http://www.kernsheriff.com/Investigations/Detective/RuralCrime/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Sheriff's Office. 2015. Substations. Available: <http://www.kernsheriff.com/FieldOps/Substations/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Sheriff's Office. 2015. Taft Substation. Available: <http://www.kernsheriff.com/FieldOps/Substations/Taft/Pages/default.aspx>. Accessed November 25, 2015.
- Kern County Water Agency. No date. *1995 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
- Kern County Water Agency. 1996 (August). *Proposed Monitoring Plan for the Kern Fan Element of the Kern Water Bank*. Draft Report. Bakersfield, CA. Prepared by Kenneth D. Schmidt and Associates, Fresno, CA.
- Kern County Water Agency. 2005 (April). *2001 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.

- Kern County Water Agency. 2007 (October). *1996–2000 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
- Kern County Water Agency. 2009 (September). *2002–2004 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
- Kern County Water Agency. 2011 (November). *Kern Integrated Regional Water Management Plan, Tulare Lake Basin Portion*. Available: <http://www.kernirwmp.com/documents.html>.
- Kern County Water Agency. 2011 (November). *Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan*. Final Update. Prepared by Kennedy/Jenks Consultants. Oxnard, CA.
- Kern County Water Agency. 2013 (December). *Amended 2005–2006 Kern Fan Monitoring Committee Area Operations and Monitoring Report*. Bakersfield, CA.
- Kern County Water Agency. 2015. KCWA Groundwater Quality Database.
- Kern County Water Agency. 2015 (March). Kern County Water Agency Response to Information Request for Blending Operations Data—Available Data from 2001 to Present Compiled by Michelle Anderson. Bakersfield, CA.
- Kern County Water Agency. 2015 (April). Kern County Water Agency Response to Information Request for Groundwater Quality Data—Available Data from 1984 to Present Compiled by Michelle Anderson. Bakersfield, CA.
- Kern County Water Agency. 2015 (July). Kern County Water Agency Response to Information Request for Kern River and Friant Kern Canal water quality data—Available Data from 2006 to 2014. Provided by Nick Gatti. Bakersfield, CA.
- Kern County Water Agency and California Department of Water Resources. 1994 (February). *Kern Water Bank Monitoring Report. Semiannual Water Level and Water Quality Report, Spring 1991, 1992 & 1993*.
- Kern Water Bank Authority. 1996. *Kern County Water Agency–Kern Water Bank Authority, Interim Water Recharge Project, Biological Monitoring Report for Period April 1995–March 31, 1996*. Bakersfield, CA.
- Kern Water Bank Authority. 1997. *Sampling Plan for Groundwater Monitoring for Kern Fan Monitoring Program*.
- Kern Water Bank Authority. 1997 (October). *Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan*.
- Kern Water Bank Authority. 1997 (October). *Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, Volume II, Environmental Assessment*.
- Kern Water Bank Authority. 1998 (January 1). *Kern Water Bank Authority 1997 Annual Compliance Report*. Bakersfield, CA.
- Kern Water Bank Authority. 1999 (March 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, Annual Compliance Report—January 1, 1998 through December 31, 1998*. Bakersfield, CA.

- Kern Water Bank Authority. 2000 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 1999 Annual Compliance Report and 2000 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2001 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2000 Annual Compliance Report and 2001–2002 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2002 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2001 Annual Compliance Report and 2002–2003 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2003 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2002 Annual Compliance Report and 2003–2004 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2004 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2003 Annual Compliance Report and 2004–2005 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2005 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2004 Annual Compliance Report and 2005–2006 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2006 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2005 Annual Compliance Report and 2006–2007 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2007 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2006 Annual Compliance Report and 2007–2008 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2008 (November 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2007 Compliance Report and Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2009 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2008 Compliance Report and Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2010 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2009 Compliance Report and 2010–2011 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2011 (May 1). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2010 Compliance Report and 2011 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2012 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2011 Compliance Report and 2012 Management Plan*. Bakersfield, CA.

- Kern Water Bank Authority. 2012. *Kern Water Bank Recovery Program Water Quality Monitoring Plan*.
- Kern Water Bank Authority. 2013 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2012 Compliance Report and 2013 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2014 (May). *Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan*. Bakersfield, CA.
- Kern Water Bank Authority. 2014. *Land Subsidence: Land Subsidence and the Kern Water Bank*. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/1560>. Accessed March 3, 2015.
- Kern Water Bank Authority. 2015. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed April 20, 2015.
- Kern Water Bank Authority. 2015. *Kern River Alluvial Fan Groundwater Flow Model Report*. Prepared by Amec Foster Wheeler.
- Kern Water Bank Authority. 2015. Sensitive Wildlife Species. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/376>. Accessed December 1, 2015.
- Kern Water Bank Authority. 2015 (December). KWBA Response to Information Request Regarding Monthly Recharge Volumes by Source.
- Kern Water Bank Authority. 2016. Community/Culture. Available: <http://www.kwb.org/index.cfm/fuseaction/Pages.Page/id/351>. Accessed February 19, 2016.
- Kern Water Bank Authority and Chevron Pipeline Company. 2010 (December 1). *Settlement Agreement*.
- King, C. 1990. *Evolution of Chumash Society*, New York: Garland Publishing.
- Kiparsky, M., and P. H. Gleick. 2003. *Climate Change and California Water Resources: A Survey and Summary of the Literature. The California Water Plan, Volume 4 – Reference Guide*. Oakland, CA: Pacific Institute for Studies in Development, Environment, and Security.
- Knowles, N., M. Dettinger, and D. Cayan. 2006. Trends in Snowfall versus Rainfall in the Western United States. *Journal of Climate* 19(18):4545–4559.
- Lincus Incorporated for Pacific Gas and Electric Company. 2015 (October). *Kern Water Bank Authority (WISE-035-01) Pump Efficiency Improvement Installation Report*. Emeryville, CA.
- Lincus Incorporated for Pacific Gas and Electric Company. 2015 (October). *Kern Water Bank Authority (WISE-076) Pump Efficiency Improvement Installation Report*. Emeryville, CA.
- LUFT Engineers & Environmental Consultants, Inc. and Kern Water Bank Authority. 1997 (June). *Review of Closure of Sumps in Strand Oil Field*.
- Luhdorff & Scalmanini Consulting Engineers. 2014 (July). *Land Subsidence from Groundwater Use in the San Joaquin Valley*. Prepared by J. Borchers, and M. Carpenter, with support by the

- California Water Foundation. Available: <http://www.groundwatervoices.com/wp-content/uploads/2014/07/San-Joaquin-Subsidence-Report-July-24-2014.pdf>. Accessed March 5, 2015.
- McGaegee, M. R. 2013 (October 14). *Annual Groundwater Monitoring Report at the Hondo, Inc. Facility 20807 Stockdale Highway*. Bakersfield, CA.
- MIG. 2007. *Bakersfield Recreation and Parks Master Plan*. Fullerton, CA. Prepared for the City of Bakersfield, Bakersfield, CA. Available: http://www.bakersfieldcity.us/recreation/pdfs/Rec_Parks_Master_Plan.pdf. Accessed April 21, 2015.
- Moratto, M. J. 1984. *California Archaeology*. Orlando, FL: Academic Press.
- Moser, S., G. Franco, S. Pittiglio, W. Chou, and D. Cayan. 2009. *The Future is Now: An Update on Climate Change Science Impacts and Response Option for California*. California Energy Commission Public Interest Energy Research Program, California Climate Change Center. CEC-500-2008-071.
- Mote, P., A. Hamlet, M. Clark, and D. Lettenmaier. 2005. Declining Mountain Snowpack in Western North America. *American Meteorological Society*, January 2005.
- Moyle, P. B. 2002. *Inland Fishes of California*. University of California Press, Berkeley, CA.
- Murphy, P. G. 1999. *Addendum V: Four New Berm Sites [location redacted]. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California*. Three Girls and a Shovel, Bakersfield, CA.
- Office of the Governor. 2015 (April 29). New California Goal Aims to Reduce Emissions 40 Percent Below 1990 Levels by 2030. Available: <https://www.gov.ca.gov/news.php?id=18938>. Accessed April 18, 2016.
- Pacific Gas and Electric Company. 2015. Greenhouse Gas Emission Factors. Available: https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf. Accessed December 10, 2015.
- Pacific Environmental Group, Inc. 1996 (August 15). *Sludge Sampling and Analysis and Proposed Sump Closure Protocol, Vintage Subsurface Facility Removal Project, Kern County, California*.
- Pacific Institute. 2013. Desalination and Energy Use...Should We Pass the Salt?. Available: <http://pacinst.org/desal-and-energy-use-should-we-pass-the-salt/>. Accessed March 1, 2016.
- Page, R. W. 1983. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin County, California, with a Section on Ground-Water Management Considerations and Use of Texture Maps*. U.S. Geology Water-Resources Investigations Technical Report 83-4000. Sacramento, CA.
- Page, R. W. 1986. *Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections*. U.S. Geological Survey Professional Paper 1401-C. Washington, DC.
- Pruett, C. L. 1997. *Addendum 1: Emergency Flood Area. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project near Bakersfield, Kern County, California*. Three Girls and a Shovel, Bakersfield, CA.

- Pruett, C. L. 1999. *Addendum VI: A Cultural Resources Assessment for New Berms [location redacted], Kern County, California*. Three Girls and a Shovel, Bakersfield, CA.
- Riddell, F. A., and W. E. Pritchard. 1969. "An Early Man Site in the San Joaquin Valley, California." *American Antiquity* 34(2):21–130.
- Rosedale–Rio Bravo Water Storage District and Irvine Ranch Water District. 2015 (April). *Stockdale Integrated Banking Project Draft Environmental Impact Report* (SCH # 2013091076). Available: <http://www.rbwds.com/wp-content/uploads/2015/04/2015-04-Stockdale-DEIR-optimized.pdf>.
- RWQCB Geotracker. 2015. Chevron Pipeline Wait-Midway. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL205234273. Accessed May 14, 2015.
- RWQCB Geotracker. Continental Carbon Co. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SLT5FQ494341. Accessed November 2015.
- RWQCB Geotracker. 2015. Uhler Fire Fighting Facility. Available: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0602903940. Accessed May 14, 2015.
- San Joaquin Valley Air Pollution Control District. 2001. Rule 4106. Prescribed Burning and Hazard Reduction Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.
- San Joaquin Valley Air Pollution Control District. 2010 (April). Rule 4013. Open Burning. Available: <https://www.valleyair.org/rules/1ruleslist.htm>. Accessed April 8, 2016.
- San Joaquin Valley Air Pollution Control District. 2015 (March). *Guidance for Assessing and Mitigating Air Quality Impacts*. Available: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed December 27, 2015, and January 4, 2016.
- San Joaquin Valley Air Pollution Control District. 2009. *Guidance for Valley Land Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA*. Available: <http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>. Accessed February 9, 2016.
- San Joaquin Valley Air Pollution Control District. 2002. *Guide for Assessing and Mitigating Air Quality Impacts*.
- Savage, D. E. 1951. Late Cenozoic Vertebrates of the San Francisco Bay Region. *University of California Publications, Bulletin of the Department of Geological Sciences* 28(10):215–314.
- Smith, A. R. 1964. *Geologic Map of California Bakersfield Sheet*. California Division of Mines and Geology. Sacramento, CA.
- Smith, S. A. 2015. Recent Innovations in Well Rehabilitation. Available: <http://www.groundwaterscience.com/resources/tech-article-library/94-recent-innovations-in-well-rehabilitation.html>.
- Smith, T. G. 1983 (December). *Kern Front, New Hope, and Premier Faults, Kern County*. Fault Evaluation Report FER-143. California Division of Mines and Geology. Sacramento, CA.
- Smith, T. G. 1984 (February). *Faults East of Bakersfield, Kern County*. Fault Evaluation Report FER-145. California Division of Mines and Geology. Sacramento, CA.

- Sneed, M., J. Brandt, and M. Solt. 2013. *Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California, 2003–10*. U.S. Geological Survey Scientific Investigations Report 2013–5142. Prepared in cooperation with the U.S. Bureau of Reclamation and the San Luis and Delta-Mendota Water Authority. Available: <http://pubs.usgs.gov/sir/2013/5142/>. Accessed March 3, 2015.
- Society of Vertebrate Paleontology. 1995 (January). *Society for Vertebrate Paleontology News Bulletin*, Number 163. http://www.ci.benicia.ca.us/vertical/sites/%7B3436CBED-6A58-4FEF-BFDF-5F9331215932%7D/uploads/SVP_1995.pdf.
- Society of Vertebrate Paleontology. 2016. Guidelines from the Ethics Education Committee for Collecting, Documenting and Curating Fossils. Available: <http://vertpaleo.org/The-Society/Governance-Documents/Guidelines-from-the-Ethics-Education-Committee-for.aspx>.
- State Water Resources Control Board. 2003 (April). Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (General WDRs). Water Quality Order No. 2003 0003 DWQ 30.
- State Water Resources Control Board. 2009 (September 2). NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, 2009 0009 DWQ (Construction General Permit).
- State Water Resources Control Board, 2015. Water Quality Chemicals and Parameters. Available: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/EDTlibrary.shtml. Last updated July 22, 2015. Accessed November 30, 2015.
- University of California Museum of Paleontology. 2015. Paleontological Collections Database.
- U.S. Census Bureau. 2016. Census Bureau website. Available: http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed January 22, 2016.
- U.S. Climate Change Science Program. Overview of U.S. Research on Climate and Global Change. Available: <http://www.climatechange.gov>. Accessed March 3, 2005.
- U.S. Environmental Protection Agency website, <https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals#what-are-secondary>, accessed April 21, 2016.
- U.S. Environmental Protection Agency. 2009. *Federal Register*, 40 CFR Parts 86, 87, 89 et al. Mandatory Reporting of Greenhouse Gases; Final Rule. Available: <http://www.epa.gov/sites/production/files/2014-09/documents/ghg-mrr-finalpreamble.pdf>. Accessed February 2, 2016.
- U.S. Environmental Protection Agency. 2015. eGRID 2012 Summary Tables. Available: http://www.epa.gov/sites/production/files/2015-10/documents/egrid2012_summarytables_0.pdf. Accessed December 10, 2015.
- U.S. Fish and Wildlife Service. 2015 (May 13). *List of Threatened and Endangered Species that May Occur in Your Proposed Project Location, and/or May Be Affected by Your Proposed Project: Kern Water Bank. Sacramento, CA*.

- U.S. Geological Survey. 2014. Historic Earthquakes, Fort Tejon, California. Available: http://earthquake.usgs.gov/earthquakes/states/events/1857_01_09.php. Last updated April 18, 2014. Accessed May 13, 2015.
- U.S. Natural Resources Conservation Service. 2014 (September). Web Soil Survey. Available: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed May 1, 2015.
- VanRheenen, N. T., A. W. Wood, R. N. Palmer, and D. P. Lettenmaier. 2004. Potential Implications of PCM Climate Change Scenarios for Sacramento–San Joaquin River Basin Hydrology and Water Resources. *Climatic Change* 62:257–281.
- Wallace, W. J. 1978. "Southern Valley Yokuts." In R. F. Heizer, ed., *Handbook of North American Indians*, Vol. 8, California, pages 448–461. Washington, DC: Smithsonian Institution.
- Western Climate Initiative. 2009 (January 6). *Background Document and Progress Report for Essential Requirements of Mandatory Reporting for the Western Climate Initiative*, Third Draft. Available: http://www.westernclimateinitiative.org/dmdocuments/mandatory_reporting_3rd_draft_010609.74.pdf. Accessed March 13, 2012.
- West Kern Water District. 2012 (April 24). Board of Directors Meeting Minutes Report.
- WestLaw Next by Thompson Reuters. 2015. California Code of Regulations. Available: https://govt.westlaw.com/calregs/index?_lrTS=20151215173928352&transitionType=Default&contextData=%28sc.Default%29#agency. Accessed December 11, 2015.
- Woodring, W. P., R. Stewart, and R. W. Richards. 1940. *Geology of the Kettleman Hills Oil Field, California; Stratigraphy, Paleontology, and Structure*. U.S. Geological Survey Professional Paper 195. Washington, DC.

PERSONAL COMMUNICATIONS

- Bauer, Charles, for Kern County Environmental Health Services Department. 2011 (December 12). KCEHSD Hondo's Site Visit and Related Chronological Activities (2001 to 2011).
- California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2003 (September 7). Correspondence.
- California Department of Conservation, Division of Oil, Gas and Geothermal Resources. 2008 (March 7). Correspondence: Request for Assistance for Access and Environmental Clearance Strand Oil Field, Kern County Thomas Oil Company (Phase 2).
- Central Valley Regional Water Quality Control Board, Correspondence, 2011.
- Central Valley Water Quality Control Board. 2012 (February 23). Correspondence regarding Soil Remediation and Site Groundwater Monitoring Plan, Former Frank Uhler Fire Training Facility, February 23, 2012.
- Central Valley Regional Water Quality Control Board. 2013 (November 15). No Further Action Letter, Former Thomas Oil Company Leases, Strand Oil Field.
- Live Oak Associates, Inc. and Kern Water Bank Authority, Correspondence, 2008.
- Quad Knopf, Inc. and Kern Water Bank Authority. 2005 (October 3). Correspondence.

RWQCB Correspondence. 2001 (January 9). Inspection Report—Thomas Oil Company, Discharge of Oily Wastewater. Strand Oil Field, Kern County.

RWQCB Correspondence. 2001 (January 30). Inspection Report—Thomas Oil Company, Discharge of Oily Wastewater. Strand Oil Field, Kern County.

RWQCB Correspondence. 2013 (February 6). No Further Action Status Chevron Wait-Midway Pipeline.

South Valley Biological Consultants, Inc. and Kern Water Bank Authority, Correspondence, 2011.

White, Wayne. Testimony: Declaration of Wayne White, August 28, 2012.

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**APPENDIX E. STUDY OF TRANSFER,
DEVELOPMENT, AND CONTINUED USE AND
OPERATION OF THE KERN WATER BANK
(REVISED)**

**Study of the Transfer,
Development, and Continued
Use and Operation of the
Kern Water Bank (Revised)**

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I. Introduction and Format

This Revised Appendix E updates the Appendix E in the DEIR. New, deleted, or changed text, figures, and tables are shown in the following colors and manner noted below:

1. *Text additions are shown in blue underline mode;*
2. *Text deletions are shown in ~~black strikeout~~ mode.*
3. *New text/numbers inside an existing table is shown in blue underline mode.*
4. *New tables will show text/numbers in blue but without underlining for ease of reading. The new table will be numbered with a letter, as in Table 3A (this new table follows past Table 3);*
5. *New figures will be numbered with a letter and will have a blue title, as in Figure 8A (this figure follows past Figure 8);*
6. *New Endnotes are shown in blue and are identified with a letter, as in “iv(a)” (this new endnote follows iv).*

A. Overview of KFE Property in 1995

In the early 1980s, the Department began exploring the feasibility of developing a State Water Project (SWP) groundwater storage facility in Kern County, which it called the Kern Water Bank (KWB). As envisioned, the KWB would consist of a series of “elements,” which would be geographically separate projects that would be operationally integrated. The largest of these elements, the Kern Fan Element (KFE), was to be developed first, followed by a number of local elements developed with several water districts in Kern County. After evaluating the feasibility of the KFE, in 1988, the Department purchased approximately 20,000 acres of land in the Kern Fan area from Tenneco West, Inc.

However, the Department encountered many legal, institutional, and political impediments to implementation of a groundwater storage facility on the KFE property. SWP contractors also expressed concerns regarding their ongoing costs for feasibility studies and ownership of the KFE property given their assessment of the likelihood of realizing a functional groundwater storage program. In 1993, uncertainties regarding the proposed groundwater storage facility ultimately convinced the Department to halt feasibility studies and design work on the project.ⁱ The uncertainties included proposed revisions of Delta water quality standards and measures to protect threatened and endangered species, which affected the SWP’s ability to pump water from the Delta for recharge on the KFE property. Expected changes in arsenic standards for drinking water also raised questions regarding the ability of the project to meet water quality standards for pump-in to the California Aqueduct.ⁱⁱ In addition to environmental and water quality issues, the Department and KCWA could not reach agreement on measures to comply with Water Code Section 11258, which required approval of local agencies for development of the groundwater banks. Later, in response to the constraints on Delta pumping and these other uncertainties, the Department suspended activities on the KFE property. ~~concluded that these~~

~~constraints on Delta pumping made development of an SWP groundwater storage facility in the Kern Fan Element infeasible.~~ⁱⁱⁱ In 1994, the potential of the Department's proposed KFE for SWP groundwater storage remained unrealized.

In 1994, the Department and representatives of the agricultural and urban contractors negotiated a set of principles known as the Monterey Agreement. As part of these principles, the parties agreed to the Department's sale or lease of the KFE property to designated SWP agricultural contractors, in exchange for the permanent retirement of 45,000 acre-feet (AF) of these contractors' Table A amount. The Monterey Amendment, which was the amendment to the SWP contractors' long-term water supply contracts that implemented the Monterey Agreement principles, provided for the State's transfer of ownership of the KFE property to Kern County Water Agency (KCWA), and then to the Kern Water Bank Authority (KWBA), for local agency development and use as a groundwater bank.

B. Purpose [of Appendix E](#)

The purpose of ~~this~~ [the DEIR Appendix E](#) report ~~is~~ [was](#) to provide an independent study by the Department of the KWB, as required under the May 5, 2003 Settlement Agreement between the Planning and Conservation League et al., the Department, and SWP contractors.^{iii(a)} Section III(F) of the Settlement Agreement requires the Department to prepare an independent study, and exercise "its judgment regarding the impacts related to the transfer, development, and operation of the KWB in light of the Kern Environmental Permits." The agreement also requires that the study "identify SWP and any non-SWP sources of water deliveries to KWB." To evaluate the impacts, the Department used the KFE property conditions and facilities that existed before the Department conveyed the KFE property to KCWA as the baseline for the evaluation.

[This Revised Appendix E updates information through 2014 such as hydrology, Kern County water banking programs, and recent and planned KWB development and continued use and operation as a locally owned and operated groundwater banking and recovery project \(KWB activities\).](#)

II. Methods

[In DEIR Appendix E](#), ~~information~~ from three sources was used [by the Department](#) to evaluate the transfer, development, and operation of the KWB by the Kern Water Bank Authority (KWBA). The first source was the Annual Compliance reports for 1999 through 2005. These reports are prepared each year by the KWBA and submitted to the California Department of Fish and Game (CDFWG) and the U.S. Fish and Wildlife Service (USFWS), as required under their environmental permits, and were used in this study to determine what facilities were constructed, how the project is operated (recharge and extraction operation), identify vegetation, terrestrial and aquatic wildlife use of the site, and identify incidences of "take" in light of the Kern Environmental Permits. [\(On January 1, 2013, CDFG changed its name to the California Department of Fish and Wildlife \(CDFW\); this document retains the old name when used in activities prior to 2013.\)](#) The second source was staff from KCWA and KWBA, who were consulted to provide additional information on recharge and recovery activities of SWP and

non-SWP water at the KWB, and to evaluate where water could have been banked in Kern County in the absence of the KWB. The third source was personnel from CDFG and USFWS, who were contacted to determine if the resources agencies had any concerns with the development or operation of the KWB in light of the KWB environmental permits.

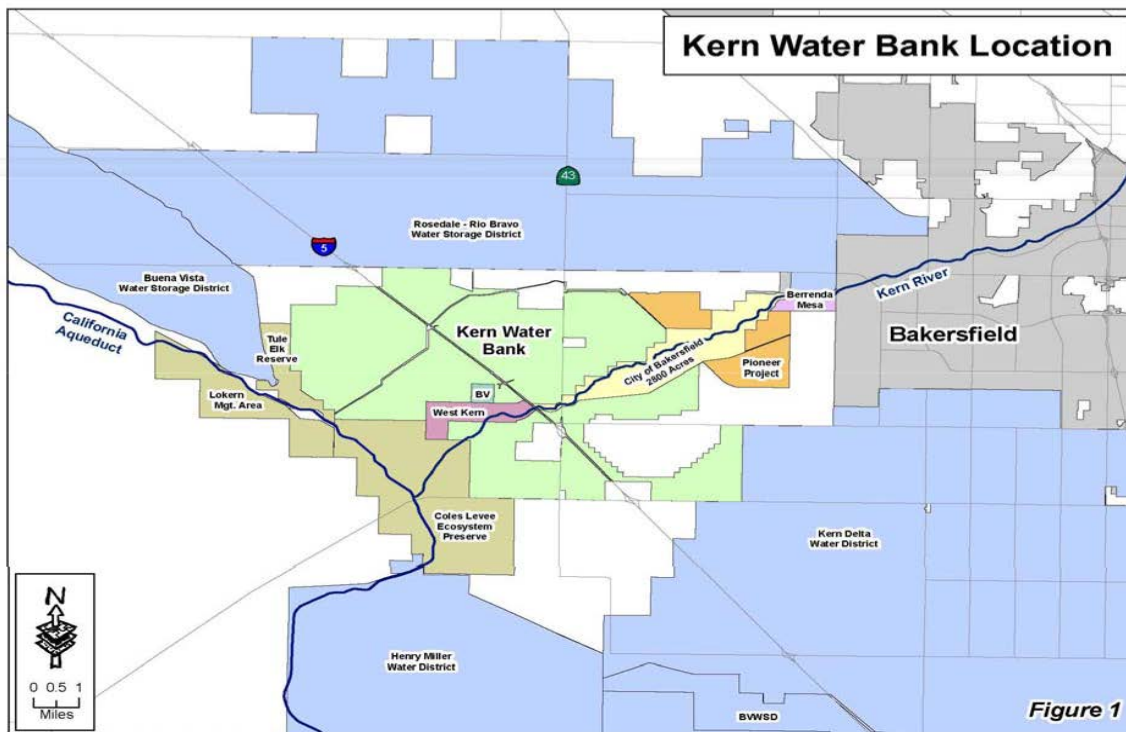
The Department is updating the information in this Revised Appendix E through 2014. The Department also is adding an analysis of additional potential impacts of the KWB activities, especially in the area of groundwater levels and groundwater quality. The methods used for the updated resources analyses are presented in Chapter 7, Environmental Analysis, of this Revised Environmental Impact Report (REIR).

III. Existing Conditions and Surroundings – 1995

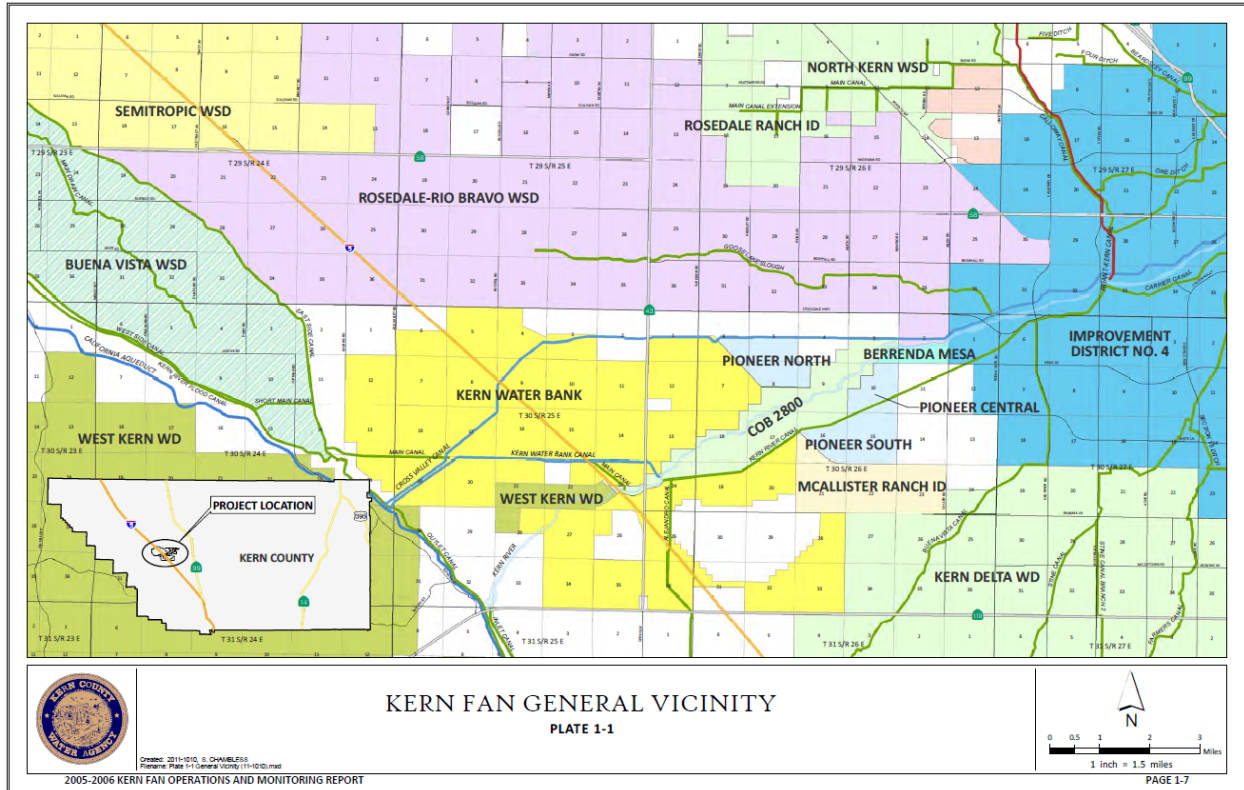
The KFE property¹ is located in Kern County, about 12 miles southwest of the City of Bakersfield (Figure 1). The property is situated between Taft Highway (State Route [SR] 119) to the south, Stockdale Highway to the north, Tupman and Morris Roads to the west, and South Allen Road to the east.

The Kern River and adjoining lands of the City of Bakersfield 2,800-Acre Groundwater Recharge Facility and West Kern Water District (WD) Groundwater Banking project divide the northern and southern portions of KWB Lands (Figure 1). A small portion of the Kern River also flows through the southwest corner of KWB Lands from northeast to southwest. The California Aqueduct is located adjacent to and west of the property. The KWB Canal and the Cross Valley, Main, Pioneer, River, Alejandro, and James Canals, and several unnamed ditches, traverse KWB Lands.

¹ The court in PCL v. DWR (2000) referred to the KFE property as the KWB in its decision. The KFE property consists of the approximately 20,000 acres acquired by the Department from Tenneco West, Inc. The property was acquired for the purposes of developing the KFE, one of a series of groundwater banking “elements” that together would constitute the KWB. As envisioned, the eight or so elements of the KWB would be geographically separate projects that would be operationally integrated. Therefore, the terms KFE and KWB are not interchangeable, and what is now called the KWB is only a portion of the KWB envisioned by the Department. For simplicity, this document will use the term KWB to refer to the groundwater bank developed by the KWBA on the former KFE property (referred to as “KWB Lands” after 1995), and the term KFE property to refer to the approximately 20,000 acres of land acquired by the Department.



[The KWB Lands](#) consists of approximately 20,000 acres of gently sloping land overlying the Kern River Alluvial Fan (Figure 1A). Surrounding lands are used primarily for agriculture, oil and gas production, habitat preserves, or other water banking programs. Prior to the development of the KWB, most of the land was used for agriculture, and irrigation water was provided by surface water deliveries by the former James-Pioneer Improvement District of North Kern Water District, and by groundwater pumping. Agricultural water supplies for lands surrounding the KWB are provided by Rosedale-Rio Bravo Water Storage District for most lands to the north, by Kern Delta Water District for lands to the southeast, by Henry Miller Water District for lands to the south, and by Buena Vista Water Storage District for lands to the northwest. The Tule Elk State Reserve, Coles Levee Ecosystem Preserve, and Lokern Management Area are located west and south of the KWB. [The Buena Vista Aquatic Recreational Area](#) is located to the south. [KWB Lands also surround Kern County Raceway Park](#), located at Interstate 5 and Panama Lane. [A solar energy farm is located near the southwest portion of KWB Lands.](#)



KCWA, 2005

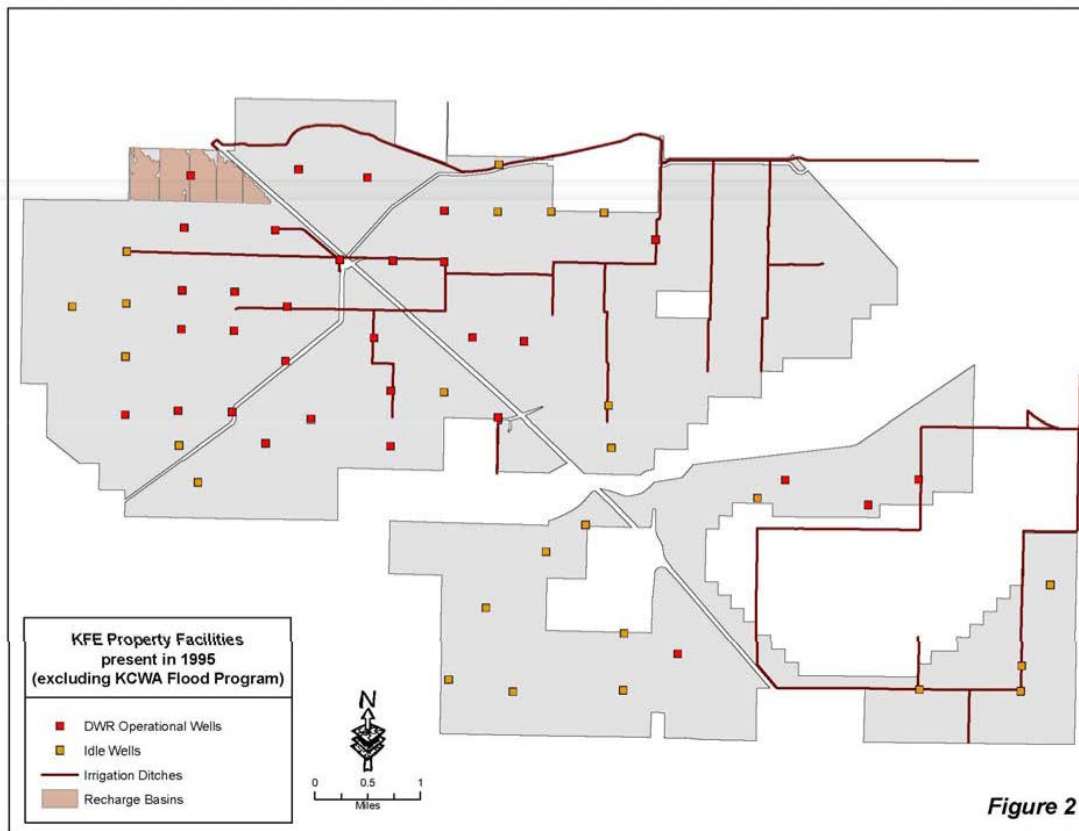
KWB Lands within the Kern Fan Area

Figure 1A

The KWB is one of several groundwater banks in Kern County. Other groundwater banks include: Berrenda Mesa Project (operational since 1983); City of Bakersfield 2,800 Acre Recharge Basin (operational since 1978); Pioneer Project, including Kern River Channel (operational since 1995); West Kern/Buena Vista (operational since 1978); Arvin-Edison Water Storage District (operational for groundwater banking for other districts since 1990); Semitropic Water Storage District (operational for groundwater banking for other districts since 1990), [Kern Delta Water District \(operational since 2003\)](#); [Buena Vista Water Storage District \(operational since 2003\)](#); [Irvine Ranch Water District – Strand Ranch Integrated Banking Project \(operational since 2013\)](#); and the [Rosedale-Rio Bravo Water Storage District \(Rosedale\) Banking Program \(operational since 2003\) \(Figure 1A\)](#). With the exception of the Arvin-Edison, Berrenda Mesa Project, Kern Delta, and Semitropic groundwater banks, all of the projects are located adjacent to the KWB on the Kern River Alluvial Fan. While KWB provisions allow for lower priority use by others (see Section V.B.4), such use has only been by KCWA member agencies and has been very limited in scope. The Arvin-Edison, [Buena Vista](#), [Kern Delta](#), [Rosedale](#), and Semitropic banks allow participation by non-Kern County entities; the other banks mentioned above limit participation to Kern County entities ([see REIR Section 10.1, Cumulative Environmental Impacts, for more detail on the surrounding water banks](#)).

A. Existing KFE Property Facilities

The facilities that existed on the KFE property in early 1995 are shown in Figure 2.



1. Recharge

Tenneco constructed approximately 320-300 acres of recharge ponds in the northwestern portion of the KFE property prior to its acquisition by the Department in 1988 ([Kern Water Bank First Stage Kern Fan Element Draft Supplemental Environmental Impact Report, December 1990, DWR](#)). These ponds are known informally as the Stockdale Highway Ponds. The Department did not construct any recharge ponds on the KFE property during its ownership of the property.

2. Recovery

Sixty-five agricultural wells were present on the KFE property when it was acquired by the Department in 1988. During the Department's ownership of the property, it initiated a program of refurbishing some of these existing wells, so that it could recover water it had purchased from La Hacienda, Inc.² At the time the property was transferred to KCWA, 31 of the 65 existing wells were considered operable, although 3 of these were not connected to any conveyance facilities. The remaining 34 were idle wells in various states of disrepair.

² The purchase was of 98,000 acre-feet of stored Kern River water, which had originally been recharged at the City of Bakersfield's 2800 acre project. (KWB First Stage KFE Feasibility Report, December 1990)

3. Conveyance

At the time the Department acquired the KFE property in 1988, the property included a number of conveyance facilities that had been constructed primarily for the delivery of irrigation water for the agricultural activity occurring then and historically on the property. These facilities were not constructed for water bank operations of recharge and recovery, and many were not suitable for these purposes. An exception was the Pioneer Canal, which could have been used to deliver water for recharge to the existing approximately ~~320~~300 acres of Stockdale Highway Ponds. Other nearby facilities, including the Cross Valley Canal, the City of Bakersfield's Kern River Canal, and Buena Vista WSD's Alejandro Canal, could have been used to convey water recovered from the 31 operable wells on the KFE property. However, these facilities were owned by others and could only have been used for banking purposes when unused capacity was available. During the Department's ownership of the property, the Department constructed conveyance facilities of small capacity to convey water recovered from certain of the individual operable wells to these larger nearby conveyance facilities.

B. KCWA Flood Emergency Program

In 1995, KCWA requested and was granted the use of the KFE property for emergency spreading of water to mitigate projected flooding of agricultural lands due to high flows on the Kern and Kaweah Rivers. KCWA requested use of approximately 3,200 acres of the KFE property for the emergency delivery and controlled spreading of local floodwater flows. KCWA proposed spreading water from the Kern and Kaweah Rivers onto existing Kern County spreading basins (including KCWA's Pioneer Project, the City of Bakersfield's 2,800 acres, Berrenda Mesa Ponds, and Rosedale-Rio Bravo Ponds), and diverting the remaining flood flows (up to 500 cubic feet per second (cfs)) onto a portion of the Department's KFE property. KCWA proposed constructing up to 2,300 acres of recharge ponds on 3,200 acres of the property.

The Department conditioned its approval of KCWA's construction plans upon KCWA satisfaction of the endangered species acts requirements. In consultation with the USFWS and CDFG, KCWA performed biological surveys of the areas that it proposed to flood in order to avoid any threatened or endangered species, in compliance with federal and State endangered species acts. KCWA obtained endangered species agreements with USFWS and CDFG to develop 2,300 acres of spreading ponds. The Department added additional conservation conditions in a separate agreement. KCWA prepared a CEQA Negative Declaration and filed a Notice of Exemption for the project's CEQA compliance. Subsequently, the Department approved³ a second request by KCWA to divert water onto an additional 1,800 acres of spreading ponds on an additional 5,000 acres of KFE land. The Department also agreed to extend its initial agreement with KCWA to March 31, 1997.⁴

As a result of these agreements, in 1995 KCWA constructed approximately 1,518 acres of recharge ponds on the initial 3,200 acres of KFE property, and approximately 1,516 acres of recharge ponds on the additional 5,000 acres of KFE land (Figure 3). Under the flood

³ Letter, John J. Silveira, DWR to Thomas Clark, KCWA; June 2, 1995

⁴ Letter, Robert G. Potter, DWR to Thomas Clark, KCWA; March 11, 1996

emergency program, about 230,000 AF of water was recharged in 1995 and about 144,000 AF in 1996.

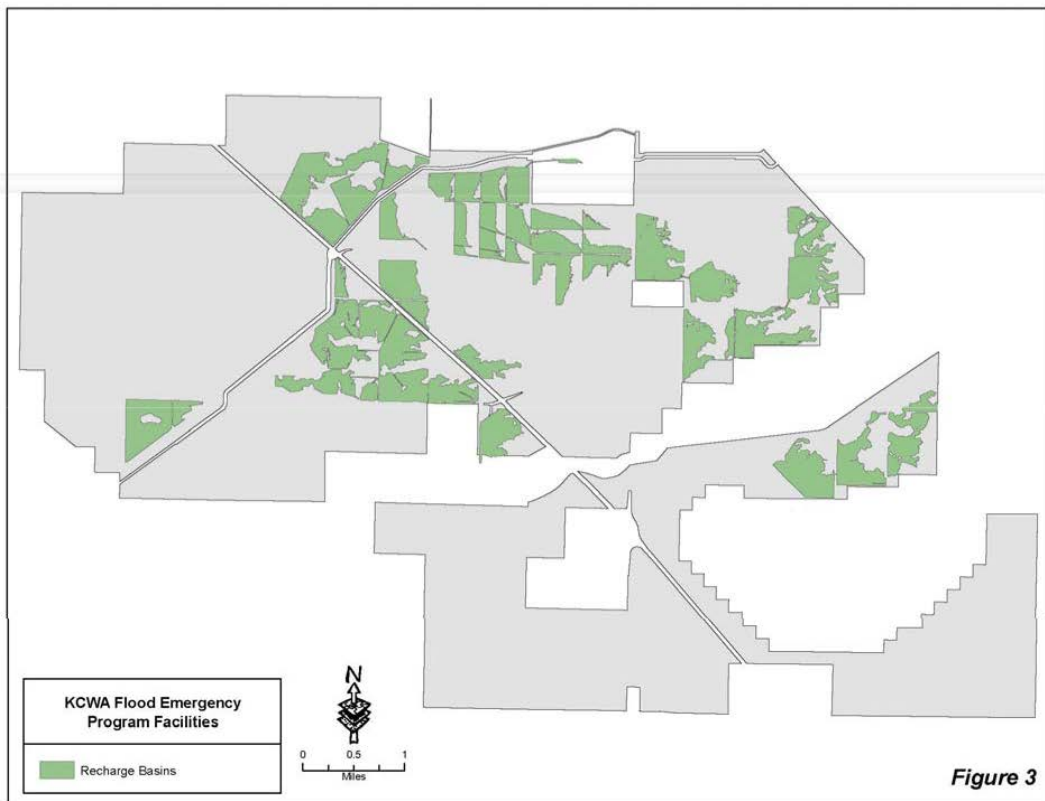
C. Land Use

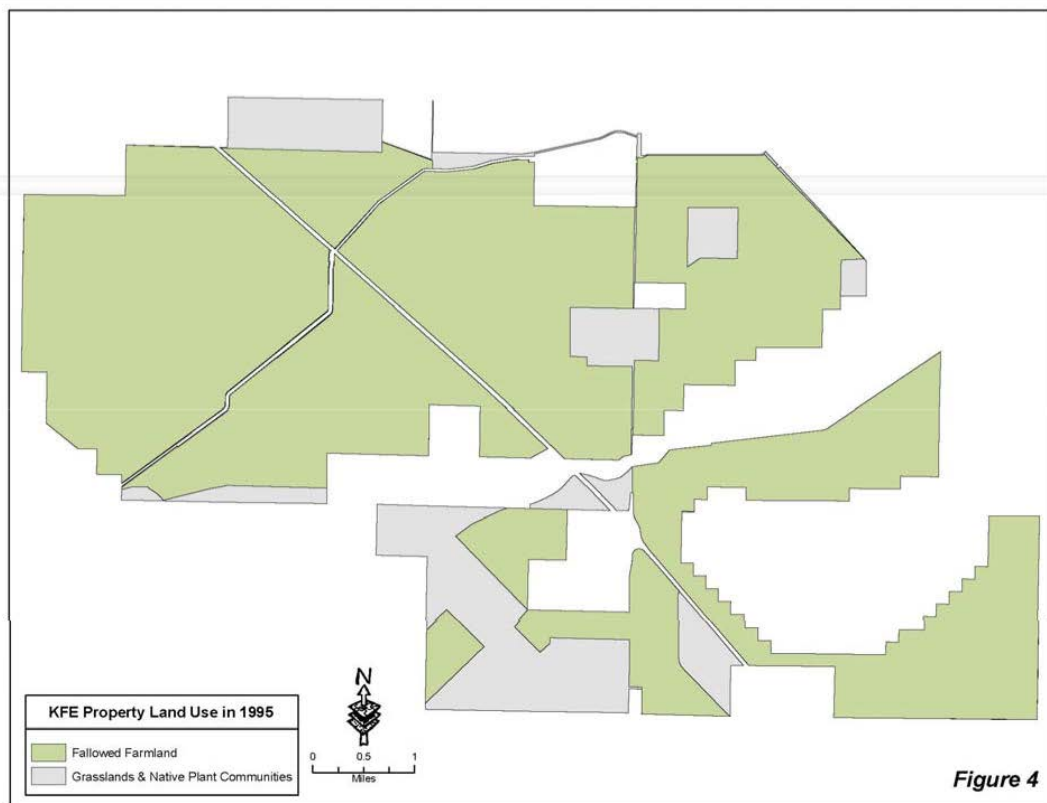
Prior to the Department's purchase of the KFE property in 1988, approximately 17,068 acres of the property was under extensive cultivation.^{iv} The remaining property contained 1,515 acres of isolated sensitive native plant communities (valley saltbush scrub, Great Valley mesquite scrub and valley sacaton grassland) and 1,317 acres of non-native grassland, which had been leased for oil recovery facilities. No wetland habitat was present in the project area, except for the canals used to convey water for agricultural use.

A Memorandum of Understanding was signed between the Department and KCWA on March 25, 1987, that provided for the phase out of all agricultural production on the KFE property by the end of 1993. In fact, one of the tenants' leases was terminated in 1989. Then in 1991, at the peak of the drought, all the remaining tenant leases were terminated, and thereafter the agricultural lands were fallowed. The land use on the KFE property in 1995 is shown in Figure 4.

[Before the KFE property was transferred to KCWA, the Department managed the KFE property by:](#)

- [performing demonstration studies and exploratory investigations for the potential development of the KFE property as a water banking facility; and](#)
- [controlling weeds, dust, trespassers, and vandalism.](#)





[Several tenants with active oil and gas extraction wells, brine disposal wells, and oil storage tanks were also on the property. One oil and gas lease tenant, Grayson Services Inc., had a residence and an equipment repair and storage yard on the property. The Kern County Fire Department operated a firefighting training facility on a portion of the KFE property.](#)

IV. Transfer of the KFE Property from the Department

By 1994, the potential of the Department’s proposed KFE for SWP groundwater storage remained unrealized. As is described in more detail in Section I.A, by this time, the Department had [suspended activities on the KFE property as a result of](#) constraints on Delta pumping and a number of other uncertainties ~~made development of an SWP groundwater storage facility on the KFE property infeasible.~~ In 1994, the Department and representatives of the agricultural and urban contractors negotiated a set of principles, subsequently implemented through the Monterey Amendment, that provided for the State’s transfer of the KFE property to KCWA, and then to the KWBA, for local agency development and use as a groundwater bank, as discussed in more detail below.

A. Monterey Amendment

The Department deferred development efforts of the KFE in the early 1990s. Subsequently, the Monterey Amendment provided for the State’s transfer of ownership of the KFE property to

KCWA for local agency development and use as a groundwater bank, in exchange for the permanent retirement of 45,000 AF of SWP Table A amount by KCWA and Dudley Ridge WD.

Article 52 of the Monterey Amendment states that:

- a) The State shall convey to the Kern County Water Agency (KCWA) in accordance with the terms set forth in the agreement between the State of California Department of Water Resource and Kern County Water Agency entitled, "Agreement for the Exchange of the Kern Fan Element of the Kern Water Bank" (the Kern Water Bank Contract), the real and personal property described therein.
- b) Subject to the approval of KCWA, other contractors may be provided access to and use the property conveyed to KCWA by the Kern Water Bank Contract for water storage and recovery. Fifty percent (50 %) of any project water remaining in storage on December 31, 1995, from the 1990 Berrenda Mesa Demonstration Program and the La Hacienda Water Purchase Program shall be transferred to KCWA pursuant to the Kern Water Bank Contract. The remaining fifty percent (50%) of any such water (approximately 42,828.5 AF) shall remain as project water and the State's recovery of such project water shall be pursuant to the provisions of a separate recovery contract. Any other Kern Water Bank demonstration program water shall remain as project water and the State's recovery of such water shall be pursuant to the provisions of the respective contracts for implementation of such demonstration programs.

Article 53(i) of the Monterey Amendment states, in part, that:

- i) On January 1 following the year in which such Monterey Amendments take effect and continuing every year thereafter until the end of the project repayment period: (i) Kern County Water Agency's (KCWA) annual entitlement for agricultural use as currently designated in Table A-1 of its contract shall be decreased by 40,670 AF; (ii) Dudley Ridge Water District's (DRWD) annual entitlement as currently designated in Table A of its contract shall be decreased by 4,330 AF; and (iii) the State's prospective charges (including any adjustments for past costs) for the 45,000 AF of annual entitlements to be relinquished by KCWA and DRWD thereafter shall be deemed to be costs of project conservation facilities and included in the Delta Water Charge for all contractors in accordance with the provisions of Article 22.

In accordance with the Monterey Amendment, the Department conveyed the KFE property to KCWA in exchange for KCWA and DRWD permanently retiring a total of 45,000 AF of agricultural Table A amounts. On December 13, 1995, the same date the Department executed the Monterey Amendments of KCWA and DRWD, the Department executed the "Agreement for the Exchange of the Kern Fan Element of the Kern Water Bank" between the Department and KCWA. This agreement provided the specific terms and conditions for the transfer of the KFE property to KCWA.

B. Exchange Agreement between the Department and KCWA

The “Agreement for the Exchange of the Kern Fan Element of the Kern Water Bank” between the Department and KCWA was executed on December 13, 1995. This agreement provided for the transfer of the KFE acreage and its fixtures from the Department to KCWA in exchange for agricultural contractors’ permanent reduction and retirement of 45,000 AF of their SWP Table A amount. The agreement transferred the property to KCWA and identified certain KCWA obligations, covenants, and agreements associated with the property, including KCWA assumption of responsibility for the Department’s endangered species agreements, in total.

It was intended that KCWA would transfer the KFE property to a joint powers authority made up of those entities that had retired a portion of their Table A amounts. Therefore, the exchange agreement between the Department and KCWA included a provision that stated that the parties’ agreed that KCWA could transfer all or a portion of the property and assign its rights and obligations to transferees who concurrently executed an agreement accepting the transfer and assignment and assumption of KCWA’s obligations, covenants, and agreements.

C. Conveyance Agreement from KCWA to KWBA

Simultaneous with the December 13, 1995, execution of the exchange agreement between the Department and KCWA, KCWA executed an agreement between it and the Kern Water Bank Authority (KWBA). This agreement transferred the KFE property from KCWA to the KWBA⁵: to develop, operate, and maintain the KFE property as a local groundwater banking project, which they called the Kern Water Bank (KWB); to develop and improve the KWB for the importation, percolation and storage of water in underground aquifers for later extraction, transportation, and; for the beneficial use of Project Participants.⁶ KWBA assumed control of the KFE property and prepared a plan for development of the property as a groundwater bank and an operating plan to bank available water from three sources – the Kern River, the Central Valley Project’s (CVP) Friant-Kern Canal, and the SWP.

V. KWBA’s Development of KWB

A. Environmental Documents and Permits

1. CEQA

A final programmatic EIR on the Monterey Agreement (“Monterey Agreement EIR”) was issued in October 1995. The Monterey Agreement EIR describes, among other things, the environmental impacts of the development of a groundwater bank on the KFE property, including construction of banking facilities and operation of a groundwater bank. ~~The KWBA,~~

⁵ The Kern Water Bank Authority is a joint power authority formed pursuant to California Government Code section 6500 et seq.

⁶ The transfer of the KFE property from KCWA to KWBA was made possible by provisions specified in Section 3, subsection 3.3 (Immediate Reconveyance) of the Kern Water Bank Contract, dated December 13, 1995.

as a responsible agency, approved the Monterey Agreement EIR on October 30, 1995. The principles of the Monterey Agreement were implemented through the Monterey Amendment. As described in Section IV above, upon execution of the Monterey Amendment, the Department transferred the KFE property to KCWA, which simultaneously transferred the property to the KWBA.

The KWBA prepared specific plans for the development and operation of a groundwater bank on the KFE property, referred to by the KWBA as the Kern Water Bank (KWB). The CEQA guidelines indicate that “subsequent activities in a program must be examined in the light of the programmatic EIR to determine whether an additional environmental document must be prepared.” A subsequent EIR is only allowed if certain findings are made, which was not the case for the proposed KWB. Instead, an [Initial Study \(IS\) and an Addendum to the Monterey Agreement EIR \(Appendix 7-6a\)](#) was prepared pursuant to §15164 of the guidelines. This addendum addressed the environmental issues related to development and construction of the KWB that had not been addressed in the programmatic EIR. The primary focus of the addendum was the Kern Water Bank Habitat Conservation Plan (HCP) and the Natural Community Conservation Plan (NCCP) ([Appendix 7-7a](#)), which primarily address the impacts of the project on endangered species. However, the addendum also addressed the impact on cultural resources, groundwater impacts on surrounding landowners, and mosquito abatement, among other things. The HCP/NCCP is discussed in more detail below.

After completion of the environmental analysis, and establishment of [findings and](#) appropriate mitigation measures, the KWBA concluded that the entire project, as revised by the mitigation measures, would have no significant effect on the environment. A Notice of Determination was filed July 4, 1996, and no legal challenge was filed.

2. CESA/ESA

a. Permits

[KWBA negotiated with CDFG and USFWS for specific permits that would allow KWBA to construct, operate, and maintain the KWB.](#) To allow for the management and operation of the KWB in accordance with the incidental take of endangered, threatened and certain other listed species, KWBA applied to the USFWS for two permits pursuant to the federal Endangered Species Act, and to the CDFG for two management authorizations pursuant to the California Endangered Species Act and the Natural Community Conservation Planning Act. One permit and one management authorization (the Project Permit/Authorization) is related to the KWB project. The other permit and management authorization (the Master Permit/Authorization) is related to a conservation bank to be used as potential mitigation for activities by third parties within designated areas of the Southern San Joaquin Valley. The conservation bank can be used to provide mitigation for the incidental take of listed species by qualified third parties for activities that take place within Kern County, the Allensworth area of Tulare County, and the Kettleman Hills area of Kings County. Both Permits and both Master Authorizations are for a period of 75 years. The agencies prepared a Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP), an implementation agreement (IA), and a federal environmental assessment (EA) as part of the permit/authorization process.

b. HCP/NCCP

To protect endangered species on the property, the KWBA, the USFWS, and the CDFG developed the HCP/NCCP to preserve and restore habitat for threatened, endangered, and protected species. The HCP/NCCP permits certain uses for the KFE property and designates general areas (referred to as “sectors”) and acreages for those uses (Figure 5 and Table 1).

[KWBA prepared *Findings and Mitigation Measures, Implementation of the Kern Water Bank - Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan* and filed a Notice of Determination with the State Clearinghouse on June 5, 1997 \(SCH #1997107342\). A Final Environmental Assessment for the issuance of an incidental take permit under Section 10\(a\)\(1\)\(B\) of the Endangered Species Act for KWB Lands was prepared by USFWS and dated October 2, 1997.](#)

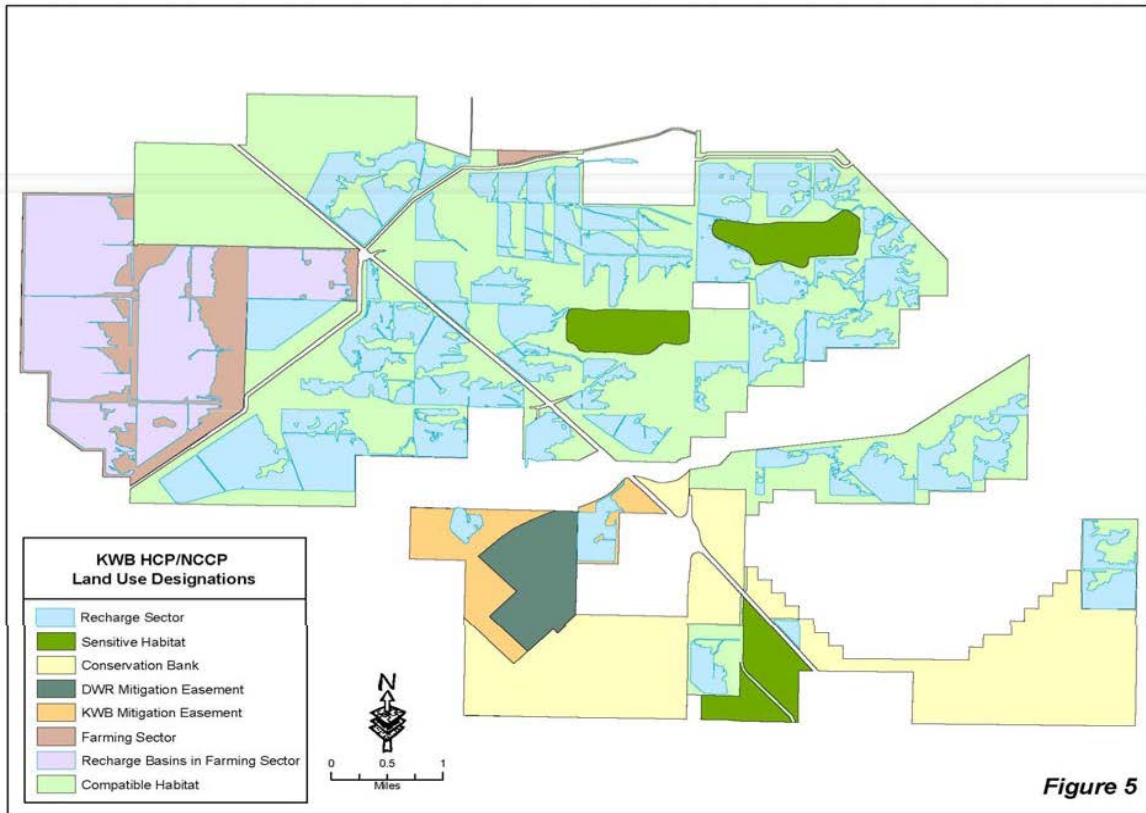


Table 1. HCP/NCCP Land Use Designations

	AREA (In Acres)
Recharge Basins	5,900
Other Water Banking Facilities	481
Compatible Habitat	5,592
Sensitive Habitat	960
Department Mitigation Land	530
Farming (including recharge ponds)	3,170
Conservation Bank	3,267
TOTAL	19,900

One of the HCP/NCCP's primary management tools is its Vegetation Management Plan (Appendix 7-7c). The Plan incorporates an adaptive management approach to improve upland habitat for the threatened and endangered species that are found on the property. The program uses methods that are compatible with the water banking activities and economically feasible for a large-scale project. Since desert species prefer low-density vegetation, the primary method used to control vegetation has been grazing and burning. To control tumbleweeds (the largest problem), KWBA has timed grazing and burning activities to promote desired native plant growth and retard the growth of the tumbleweeds.

Water banking has also caused a resurgence in wetland habitat and the return of waterfowl to the area. By 2005, To date, more than 40 new species of birds had have been sighted on the KWB Lands~~KFE property~~, including the Caspian tern, the white-faced ibis, the double-crested cormorant, and the tri-colored blackbird. See Section 7.4, Terrestrial Biological Resources, for a discussion of new special-status species observed on KWB Lands through 2014.

The Implementation Agreement of the KWBA HCP/NCCP (Appendix 7-7a) requires the KWBA to prepare and submit an Annual Report to the USFWS and the CDFG that includes the following information from the previous year:

- A summary of all activities on the KWB, including construction, and operation and maintenance of water recharge and water extraction facilities;
- A summary of Take of Covered Species and Covered Habitat;
- A summary of mitigation measures implemented;
- Results of studies completed;
- Results from the implementation of monitoring programs;
- Results from the implementation of avoidance and minimization measures;
- A report regarding the status of the Species Viability Fund;
- A copy of the KWBA's financial report evidencing KWBA's ability to fund its affirmative obligations under the KWBA HCP/NCCP and the Implementation Agreement; and
- A certification from a responsible officer of the KWBA.

Exhibit H of the KWB HCP/NCCP (Appendix 7-7a) requires KWBA to meet the Minimization of Impacts Requirements during construction and repair activities. The following actions are specified in Exhibit H:

- The delineation of all construction zones;
- Oversight of all phases of the construction on a daily basis by KWBA inspectors;
- Compliance with minimum construction standards for canals;
- An orientation program for all KWBA employees and contractors that explains endangered species concerns, notification requirements for dead, injured, or entrapped listed animals, and on-going practices requirements (e.g. construction site review and traffic, food and dog control);
- Monitoring major construction activities by a qualified biologist; and
- Biological surveys to identify San Joaquin kit fox dens, burrows occupied by burrowing owls, and signs of the presence of fully-protected species.

Table 2 shows the amount of land disturbance that was estimated in the HCP/NCCP to accompany the construction of infrastructure on the KWB, and the amount of disturbance that has actually occurred. Land disturbance is tracked in all land use sectors on the KFE property but the Farming Sector.⁷ Note that permanent water banking facilities occupy ~~only 256~~ 258 acres [in 2014](#).

B. Other Agreements and Restrictions

1. Statement of Principles – March 1995

A Statement of Principles (SOP) establishing several guidelines for a later agreement amongst the KWB participants on the establishment of a public agency to own, develop, operate and maintain the KWB project was agreed to on March 31, 1995. The key provisions of the SOP are:

- An allocation of the amount of ~~firm~~-SWP Table A amounts to be permanently retired by each of the participants, and a mechanism for other KCWA Member Units to participant in the KWB as the project moved forward; [\(Note: The allocations stated in the 1995 SOP were superseded by the joint powers agreement \[October 1995\] and are listed in Table 3.\)](#)
- A statement that the KWB's primary purpose is to augment water supplies for KWB participants;
- [A statement that the proposed KWBA may use the property for secondary purposes that are not in conflict with the primary purpose of augmenting water supplies and that do not substantially diminish the ability to use the property for this primary purpose;](#)
- A statement indicating the proposed public agency will be responsible for all KWB costs;
- The establishment of priorities for the use of the KWB by others;
- A statement that the KWB will be operated pursuant to the ~~pending~~ *Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program* (see V.B.3. below);
- [A statement that the proposed public agency will construct, at its sole cost, a diversion and conveyance facility from the Kern River to the KWB, which will be jointly owned by KWCA and the public agency with a to-be-determined capacity for the Pioneer Project. Any recharge occurring on the Pioneer Project when only the public agency is delivering water from the diversion facility is described as being credited to the project; recharge occurring at any other time will be credited to KCWA or its designee up to a decided amount.](#)

⁷ Land disturbance in the Farming Sector is not tracked since it was anticipated in the KWB HCP/NCCP to be disturbed from farming or other activities. In fact, with the exception of 45 acres ~~currently~~ [that was](#) farmed [intermittently prior to 2005](#) for the CDFG for an annual Heritage Game Bird hunt, no farming has occurred in the Farming Sector. Instead, this acreage, [some of which has been used for recharge ponds](#), has developed into exceptional upland and wetland habitat.

- A mechanism to establish agreements to share Cross Valley Canal capacity amongst other banking projects; and
- The establishment of covenants for the limitation on the future consumptive use of groundwater by the property and restrictions on the future sale, transfer, lease, etc., of the property as long as KCWA has determined that the property can be used economically for groundwater storage and recovery.

Table 2. Estimated versus actual land disturbance resulting from recharge/recovery facilities through December 2005 and December 2014.

	KWB HCP/NCCP Estimated Disturbance	Actual Disturbance (through 12/31/2005) (acres)	Actual Disturbance (through 12/31/2014) (acres)
Recharge Basins in Recharge Sector*	5,900	4,699	4,998
Permanent Water Banking Facilities			
Recovery Facilities			
Wells - Existing Hooked Up	28	14	14
Wells - Existing Not Hooked Up	38	6	6
Wells - Proposed New	66	21	21
Conveyance Facilities			
Proposed-Lined	87	0	0
Existing – Unlined	225	117	117
Supply/Recovery Canal	73	75	75
Pump Stations	12	2	3
Kern River Reverse Flow			
Earthwork (berms/levees)	4	0	0
Pump Stations			
Kern River	10	0	0
City of Bakersfield	4	0	0
New Roads	0	23	23
Subtotal	547	258	258
Temporary Disturbed Areas			
Canal Construction	73	68	68
Recovery Wells	0	16	16
Pipelines – Proposed	218	144	144
Subtotal	291	228	228
Total	6,738	5,185	5,484
* Does not include 2,415 acres of recharge ponds located in the Farming Sector.			

Source: Kern Water Bank Authority. Annual Report, May1, 2006 [and](#) KWBA, May 2014.

2. Joint Powers Agreement – October 1995

The entities that permanently retired a portion of their SWP Table A amounts (i.e., SWP contractors KCWA and Dudley Ridge WD, and KCWA member agencies Semitropic WSD, Tejon-Castac WD, and Wheeler Ridge-Maricopa WSD, and Westside Mutual Water Company, LLC) formed a joint powers authority called the Kern Water Bank Authority on October 16, 1995, with the execution of a Joint Powers Agreement (JPA). The JPA:

- Created the KWBA and established its term, purpose and powers;
- Established the internal organization of the KWBA (i.e., governed by a Board of Directors);
- Established procedures for handling KWBA’s finances;
- Described the KWBA’s KWB project and established participant rights in the project directly proportional to the amount of Table A water each participant retired to acquire the project;
- Established the relationship between the KWBA and its participants (e.g., indemnities, withdrawals, etc.); and
- Established other procedures necessary to the operation of the KWBA (e.g., amendment procedures, dispute resolution procedures, etc.)

Table 3 lists the Table A amounts retired by each KWBA participants and their corresponding ownership allocations.

Table 3. Kern Water Bank Authority Participants		
Participants	Table A Amount Retired (AF)	Allocation (%)
Dudley Ridge WD	4,330	9.62
Improvement District 4	4,330	9.62
Semitropic WSD	3,000	6.67
Tejon-Castac WD	900	2.00
Westside Mutual Water Co. ^a	21,625	48.06
Wheeler Ridge-Maricopa WSD	10,815	24.03
Total	45,000	100.00
a. Westside Mutual Water Co. was formed by a landowner that owned land within two KCWA member agencies, for the retirement of a portion of its Table A amounts. The landowner retired 15,335 AF of its Table A amount from Belridge WSD and 6,290 AF of its Table A amount from Lost Hills WD.		

3. Operations and Monitoring MOU – October 1995

The KWBA [is to](#) operates the KWB under the requirements of the *Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program* (KWB MOU; Appendix [7-5aB](#)). [The KWB MOU specifies that the KWB “shall be operated to achieve the maximum water storage and withdrawal benefits for Project Participants consistent with avoiding, mitigating, or eliminating, to the greatest extent practicable, significant adverse impacts resulting from the Project.”](#) Negotiation and execution of the KWB MOU was a prerequisite of the KWBA Member Entities’ agreement to retire the

45,000 AF of Table A amounts in exchange for the transfer of the KFE lands from the Department for the Member Entities' development of a water bank.

The 1995 KWB MOU states “consistent with the Project Description, the Project participants will make a good faith effort to meet the following objectives, which may or may not be met...” The KWB objectives include developing and operating the Project “so as to prevent, eliminate or mitigate significant adverse impacts.” The MOU’s recitals include, “Adjoining Entities and Project Participants desire that the design, operation and monitoring of the Project be conducted and coordinated in a manner to insure that the beneficial effects of the Project to the Project Participants are maximized but that the Project does not result in significant adverse impacts to water levels, water quality or land subsidence within the boundaries of Adjoining Entities, or otherwise interfere with the existing and ongoing programs of Adjoining Entities.” A Monitoring Committee, comprised of one representative of each of the Adjoining Entities and one representative of each of the KWBA participants, has numerous functions specified in the 1995 KWB MOU including, to “Develop procedures, review data, and recommend Project operational criteria for the purpose of identifying, verifying, avoiding, eliminating or mitigating, to the extent practicable, the creation of significant imbalances or significant adverse impacts.”

a. Impact Mitigation

The overall objective of the KWB MOU parties (KWBA, its Member Entities, and the districts surrounding the property [Adjoining Entities]) is that the “... design, operation and monitoring of the Project be conducted and coordinated in a manner to insure that the beneficial effects of the Project to the Project Participants [Member Entities] are maximized but that the Project does not result in significant adverse impacts to water levels, water quality or land subsidence within the boundaries of Adjoining Entities.” The adjoining entities include Buena Vista WSD, Rosedale-Rio Bravo WSD, Kern Delta WD, Henry Miller WD, and West Kern WD.

Some of the measures prescribed in the KWB MOU to protect water levels include:

- 1) spread out [\[extractions in the\]](#) recovery area;
- 2) provide buffer areas between recovery wells and neighboring overlying users;
- 3) limit the monthly, seasonal, and/or annual recovery rate;
- 4) provide sufficient recovery wells to allow rotation of use of recovery wells or the use of alternate wells;
- 5) provide adequate well spacing;
- 6) adjust pumping rates or terminate pumping to reduce impacts, if necessary;
- 7) impose time restrictions between recharge and extraction to allow for downward percolation of water to the aquifer; and
- 8) provide recharge of water that would otherwise not recharge the Kern Fan Basin.

Some of the measures prescribed in the KWB MOU to protect water quality include:

- 1) giving recharge priority to the best quality water available,
- 2) removing more salts than are recharged,

- 3) controlling the migration of poor quality water, and
- 4) extracting poorer quality groundwater where practicable (and where blending with ~~excellent~~ quality water from elsewhere in the project results in the water quality objectives of downstream users being met).

Other mitigation measures to prevent significant adverse impacts from occurring include but are not limited to the following. With consent of the affected overlying user:

- lower the pump bowls or deepen wells as necessary to restore groundwater extraction capability to such overlying user,
- provide alternative water supplies to such overlying user, and
- provide financial compensation to such overlying user.

b. Minimum Operating Criteria

The 1995 KWB MOU specifies minimum operating criteria for the KWB (Appendix 7-5a). Key sections related to potential environmental impacts are excerpted directly from the 1995 KWB MOU and presented below (headers have been added to assist the reader):

- (1) **Water Quality:** The Monitoring Committee shall be notified prior to the recharge of potentially unacceptable water, such as “produced water” from oilfield operations, reclaimed water, or the like. The Monitoring Committee shall review the proposed recharge and make recommendations respecting the same as it deems appropriate. Where approval by the Regional Water Quality Control Board is required, the issuance of such approval by said Board shall satisfy this requirement.
- (2) **Contaminated Areas:** Recharge may not occur in, on or near contaminated areas, nor may anyone spread in, on or near an adjoining area if the effect will be to mound water near enough to the contaminated area that the contaminants will be picked up and carried into the uncontaminated groundwater supply. When contaminated areas are identified within or adjacent to the Project, the KWBA and the Project Participants shall also:
 - a. participate with other groundwater pumpers to investigate the source of the contamination;
 - b. work with appropriate authorities to ensure that the entity or individual, if any, responsible for the contamination meets its responsibilities to remove the contamination and thereby return the Project Site to its full recharge and storage capacity;
 - c. operate the Project in cooperation with other groundwater pumpers to attempt to eliminate the migration of contaminated water toward or into usable water quality areas.
- (3) **Natural Recharge:** Operators of projects within the Kern Fan Area will avoid operating recharge projects in a fashion so as to significantly diminish the natural, normal and unavoidable recharge of water native to the Kern Fan Area as it existed in a pre-project condition. If and to the extent this occurs as determined by the

Monitoring Committee, the parties will cooperate to provide equivalent recharge capacity to offset such impact.

- (4) **Mitigation Credit:** The mitigation credit for fallowed Project land shall be .3 acre-feet per acre per year times the amount of fallowed land included in the Project Site in the year of calculation (which for the present approximately 19,890 acre Project Site is 5,967 AF/year (approximately 0.3 x 19,900 acres).
- (5) **Consumptive Water Use:** The lands described in Exhibit A (19,883 acres) may be utilized for any purpose consistent with the Statement of Principles, by the KWBA provided, however, the use of said property shall not cause or contribute to overdraft of the groundwater basin. In this connection, any consumptive use of water on the Property which exceeds .3 acre-feet per acre (i.e., the mitigation credit) on an acre-by-acre basis shall be provided from supplemental sources that do not create or contribute to overdraft.
- (12) **Adverse Impacts:** Recovery of banked water may not be allowed if not otherwise mitigated if it will result in significant adverse impacts to surrounding overlying users. “Adverse impacts” will be evaluated using data applicable in zones including the area which may be affected by the Project of approximately 5 miles in width from the boundaries of the Project as designated by the Monitoring Committee. In determining “adverse impacts,” as provided at this paragraph and elsewhere in this MOU, consideration will be given to the benefits accrued over time during operation of the Project to landowners surrounding the Project Site including higher groundwater levels as a result of operation of the Project. In determining non-Project conditions versus Project conditions, credit toward mitigation of any otherwise adverse impacts shall be recognized to the extent of the 4% loss and 5% loss recognized under paragraphs 2.b(10)(b) and (c), for the mitigation credit recognized under paragraph 2.b(4), if any, and to the extent of recharge on the Project Site for overdraft correction.
- (13) **Interference:** To the extent that interference, other than insignificant interference, with the pumping lift of any existing active well as compared to non-Project conditions, is attributable to pumping of any wells on the Project Site, KWBA will either stop pumping as necessary to mitigate the interference or compensate the owner for such interference, or any combination thereof. The Monitoring Committee will establish the criteria necessary to determine if well interference, other than insignificant interference, is attributable to pumping of Project wells by conducting pumping tests of Project wells following the installation of monitoring wells (if not already completed) and considering hydrogeologic information.
- (14) **Groundwater Impact Modeling:** The Kern Fan Groundwater Model, with input from the Project Participants and Adjoining Entities, and utilizing data from a comprehensive groundwater monitoring program, may be used by the Monitoring Committee as appropriate to estimate groundwater impacts of the Project.

c. Monitoring

As described above, in order to ensure that the above goals are met, the MOU provides for the establishment of a Monitoring Committee to oversee banking operations and the results of an extensive monitoring program. The committee is made up of several basin stakeholders including KCWA and all adjoining water districts. This committee has completed a number of tasks required by the MOU, including:

- Preparation of a monitoring plan;
- Specification of monitoring wells;
- Preparation of annual water balance studies and other interpretive studies of sources and uses of water within the project area and within adjoining water districts;
- Determination of the impacts of project operations on surrounding areas; and
- Development of criteria for identifying, verifying, avoiding, eliminating, or mitigating significant adverse impacts from project operations.

The Monitoring Committee may make recommendations to the KWBA and KWB participants, including without limitation recommendations for modifications in Project operations based upon evaluation(s) of data which indicate that excessive mounding or withdrawal is occurring or is likely to occur in an area of interest.

d. Loss Factors

The KWB MOU prescribes loss factors for banking operations. Evapotranspiration losses are assumed to be 6 percent of the gross amount of all water recharged. A study conducted by the KWBA using a methodology developed by the Department and KCWA for the KFE indicates actual losses by evapotranspiration will typically range from 2 percent to 4 percent. The 6 percent loss factor provides assurance that KWB banking operations will not recover more water than that actually recharged.

The KWB MOU provides that an additional 5 percent loss factor will apply to any sales of water to entities outside of Kern County. This additional water provides an overall benefit to the groundwater basin, and cannot be recovered for other uses.

In addition to these losses, 4 percent of the water recharged and stored in the KWB can be purchased by adjoining groundwater districts for overdraft correction purposes.

4. Covenants, Conditions, & Restrictions between KCWA and KWBA – December 1995

A declaration of covenants, conditions, and restrictions (CC&Rs) on the use of the KFE property was executed by the KWBA for the benefit of the KCWA on December 14, 1995, and subsequently recorded as a covenant running with the property. The CC&Rs provided for several of the provisions of the *Statement of Principles*, including:

- A limitation on consumptive use of groundwater by the KWB project of 0.3 AF/acre;

- Restrictions on the sale, transfer, lease, etc., of parts of the KFE property as long as KCWA has determined that the property can be used economically for groundwater storage and recovery,
- Restrictions on the use of any proceeds from approved KFE property sales, transfers, leases, etc.;
- Remedies for violations of the CC&Rs; and
- Priorities for the use of the KFE property.

The priorities for the use of the [KWB Lands](#) ~~KFE property~~ as described in the CC&Rs are as follows: 1st priority – KWBA Member Entities; 2nd priority – KCWA Basic Contract Member Units; 3rd priority – KCWA Non-Basic Contract Member Units; and 4th priority – Kern County entities. Any excess capacity beyond that needed for the first four priorities can be used by others under terms and conditions acceptable to KWBA and KCWA.

5. Limitations of Exports and Sales

All [water](#) transfers [and exchanges](#) from member districts of KCWA require the approval of KCWA. Current KCWA policy places limitations on the sale of banked SWP water. Department approval is required for conveyance of banked SWP water through SWP facilities. CVP contracts place limitations on potential sales of Friant-Kern CVP water. A place-of-use restriction requires the use of banked Friant-Kern groundwater to be within the CVP place of use. Consequently, these agreements and restrictions limit the classification of water that may be transferred to non-Kern County agencies.

6. Other Regulatory Permits and Approvals: 1997 – 2002

[The list of additional key permits/agreements referenced in the 2003 Settlement Agreement which are associated with KWB activities is shown in Table 3A.](#)

TABLE 3A

KEY KERN WATER BANK AUTHORITY AGREEMENTS AND PERMITS

AGREEMENT/PERMIT	DATE	OTHER PARTIES
Incidental Take Permit—PRT-828086	October 2, 1997	USFWS
Approval/Management Authorization pursuant to CESA for Implementation of KWB HCP/NCCP	October 2, 1997	CDFG (now California Department of Fish and Wildlife)
KWB HCP/NCCP Implementation Agreement and related agreements (e.g., Conservation Bank Agreement)	October 2, 1997	USFWS; CDFG
Approval, Cultural Resources Assessment and Plan for the KWBA Project	January 1997	N/A
Approval of KWB Mosquito Abatement Program	October 26, 1995	Mosquito abatement districts
Service Contracts for Operations and Maintenance	1996–current	Numerous vendors
Grazing Leases (sheep and cattle)	1997–current	Various stockmen
Minor Amendment No. 1: Hunting/Research to the KWB HCP/NCCP and Implementation Agreement	June 30, 1998	USFWS; CDFG
State of California Standard Agreement for "Improving Wildlife Habitat for Doves" (annual contract)	1998–current	CDFG
Conservation Credit Certificates	1998–current	Conservation credit buyers
Construction and Service Contracts for Master Plan Construction Project—KWB Canal, Headworks, Aqueduct Turnout, New Wells, Well Rehabilitation, Pipelines	July 1999 through August 2002	Numerous contractors and vendors
KWB Canal and Buena Vista Main Canal Joint-Use Agreement	July 20, 1999	Buena Vista Water Storage District
Agreement for Grant of Easement	September 1999	State of California acting through the California Department of Parks and Recreation
Agreement for Construction, Operation, and Maintenance of the Kern Water Bank Turnout, a Permanent Turnout Within the California Aqueduct Right of Way	November 9, 1999	California Department of Water Resources
License Agreement for Kern River Canal Crossing	November 17, 1999	City of Bakersfield
Loan Contract No. E75002 Under the Safe, Clean, Reliable Water Supply Act Water Conservation and Groundwater Recharge Subaccount (\$5,000,000)	March 2000	California Department of Water Resources, Division of Planning and Local Assistance
Reclamation Board Permit No. 17147-A GM Authorizing Construction of Pedestrian Bridge Across the Outlet Canal within the Kern River Designated Floodway	October 16, 2000	California Department of Water Resources
Reclamation Board Permit No. 16821 GM (Revised) Authorizing Construction of a 20-Foot-Wide Unlined Canal and Reinforced Concrete Gated Turnout Structure on the Right (North) Bank of the Designated Floodway and Install a 108-Inch Diameter, 700-Foot-Long, Reinforced Concrete Pipe Across (Under the Kern River)	February 26, 2001	California Department of Water Resources

Notes:

CDFG – California Department of Fish and Game; CESA = California Endangered Species Act; KWB HCP/NCCP = Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan; KWB = Kern Water Bank; KWBA = Kern Water Bank Authority; USFWS = United States Fish and Wildlife Service

Source: CC&R Documents 1995; Exhibit 2 Settlement Agreement

In addition to the key agreements and permits listed in Table 3A, other approvals required for KWB activities may have included the following:

- *Kern County Environmental Health Services Department - Permits and approvals associated with KWBA's remediation and closure of several hazardous material sites on KWB Lands.*
- *KCWA - Flowage easement across the Pioneer Property to the KWB Lands; agreements with Central Valley Canal (CVC) participants for the construction of turnouts from the CVC and/or the conversion of temporary use/long-term agreements, and use agreements for off-site portions of the Pioneer and James Canals.*
- *City of Bakersfield - Encroachment permit for the KWB Canal headworks and diversion from the Kern River and an encroachment permit and operating agreement for the conveyance through the City of Bakersfield 2,800-Acre Groundwater Recharge Facility to recharge ponds located south of the River Canal.*
- *California Department of Transportation - Encroachment permit for the KWB Canal crossing under Enos Lane.*
- *Central Valley Regional Water Quality Control Board - Stormwater general permit for construction activities and storm water pollution prevention plan.*

Local permits and approvals necessary for routine maintenance activities include the following:

- *San Joaquin Valley Unified Air Pollution Control District - Weed abatement burn permit to burn weeds on ditch bank and canals and ponding and berm banks (annual renewal).*
- *Kern County Department of Agriculture - Restricted-materials permit for use of regulated pesticides.*

7. Interim Project Recovery Operations Plan for KWBA and Rosedale Projects – 2014

a. Overview

As a result of the *Rosedale v. DWR* lawsuit, KWBA and Rosedale have developed and implemented an Interim Project Recovery Operations Plan (Appendix 7-5b). The Interim Operations Plan became effective on September 5, 2014, and designates measures to be employed to "...prevent, eliminate or mitigate significant adverse impacts" resulting from KWB and Rosedale project operations. (Pioneer Project participants and Rosedale subsequently developed and implemented a similar plan which employs essentially the same measures to prevent, eliminate, or mitigate significant adverse impacts resulting from Pioneer Project and Rosedale Project operations.)

The KWB and Rosedale Banking Programs are to be operated pursuant to the Interim Operations Plan during the time this REIR is being prepared. The Interim Operations Plan establishes a Joint Operations Committee, separate from the Monitoring Committee, to regularly evaluate groundwater impacts as well as the With-Project versus Without-Project groundwater levels,

through the use of two groundwater models, taking into account projected recovery plans. The models are used to:

- forecast groundwater levels,
- forecast when With-Project water levels become deeper than Without-Project water levels,
- forecast any localized areas of concern and/or monitoring (i.e., AOCs), and
- identify domestic wells at risk of impact.

A condition is considered a negative project impact when the With-KWB water level is 45 feet deeper than the Without-KWB water level, as forecasted by model results. The Joint Operations Committee established a process to respond to and evaluate landowner claims associated with KWB and Rosedale operations. The Joint Operating Committee uses an average of the output from the KWBA (AMEC) Model and the Rosedale (Harder) Model for this effort, or based on the experience gained, it may select a mutually agreeable groundwater model capable of accurately predicting groundwater impacts of KWB and Rosedale operations. The Joint Operating Committee provides the status of groundwater conditions, pumping rates and volumes, and model projections to each entity to identify any developing problems, and facilitates discussions within any localized AOCs. Recovery in any calendar year shall not commence until the models have been run for the projected operations and the Joint Operating Committee has met to review the results.

The Interim Operations Plan also describes specific triggers and actions for wells within an identified AOC, which includes agricultural wells, domestic wells, and other landowner claims. The plan also includes provisions for how to handle landowner claims and disputes.

The Interim Operations Plan obligates KWBA and Rosedale to contribute funds to meet mitigation obligations in an action fund: \$2 per acre-foot of recovered water from future project operations (actually pumped, not exchanged) until the Action Fund balances reaches \$1.0 million. If the Action Fund balance drops below \$500,000, contributions resume until the balance reaches \$1.0 million again. KWBA was required to initially provide \$250,000 for the Action Fund.

While the Interim Operations Plan is in effect, KWBA may repair or replace existing facilities, but may not take any action that would increase or augment its ability to recover water beyond its existing capacity (e.g., may not increase the horsepower of any well beyond that currently in place as of the date of the Interim Operations Plan). The three new wells to be constructed by KWBA as part of the Integrated Regional Water Management grant program shall be replacement wells that may not be constructed within 1.5 miles of Stockdale Highway, and are not subject to the horsepower limitations.

b. Impact Mitigation

The KWBA-Rosedale Interim Operations Plan and the Rosedale – Pioneer Project Plan each requires the formation of a Joint Operations Committee (JOC) that oversees the implementation of their respective plans, including the establishment of a process to respond to and evaluate landowner claims associated with project operations including prior (non-abandoned) 2010 landowner claims. For the sake of expediency and efficiency, the two separate JOCs have established a process whereby landowner claims are responded to and evaluated at joint meetings and in an otherwise coordinated manner (hereinafter referred to, collectively, as the “JOC”).

At the outset of the implementation of the plans, the JOC sent letters to those who in or about 2010/2011 made claims of groundwater impacts to various local groundwater banks and landowners in areas of concern. These letters alerted them to the potential for groundwater level declines to affect their wells and that the groundwater bank participants may be able to provide funds to help alleviate those impacts. Since approximately December 31, 2015, the JOC has evaluated and responded to claims filed before the Interim Plan and has received about 21 new claims from 2015. Of the pre-Interim Plan claims, eight were processed for payment and eight were rejected. Of the 2015 claims filed after the Interim Plan, 13 have been processed for payment, six have been rejected, and three were pending as of December 31, 2015.

The JOC has authorized payments totaling approximately \$447,800 as mitigation for the processed claims. These payments have been pro-rated based on the relative contribution of each of the projects toward an impact. The KWB share of these payments has been about 15%; the other projects’ collective share (Rosedale and Pioneer) has been about 85%. The mitigation measures that have been funded have included the following improvements: providing a permanent connection to a municipal provider, lowering pumps in existing wells, and drilling deeper wells. These improvements provide for a more reliable water supply for the current and future droughts, meaning that future impacts are less likely to occur because wells particularly vulnerable to declining groundwater levels have already been permanently mitigated. The JOC has also paid for and provided emergency water for domestic uses while evaluating claims, where needed.

8. 2016 Long-Term Project Recovery Operations Plan Regarding the KWB

Consistent with the 1995 KWB MOU governing its banking project, KWBA has adopted a Long-Term Project Recovery Operations Plan Regarding Kern Water Bank Authority Project (2016 Long-Term Operations Plan)(Appendix 7-5c). This plan applies to neighboring landowners currently using groundwater for overlying uses from an agricultural supply or domestic well. It does not apply to new wells that are installed to unsuitable depths based on historic water level fluctuations.

Plan components include:

- Establishing a protocol for monitoring and reporting groundwater conditions to the KWBA Board of Directors and the public, including reporting groundwater levels monthly and regularly updating its groundwater model to actual conditions;

- [Using the groundwater model as a tool to forecast groundwater levels and evaluate groundwater impacts resulting from KWB operations; and](#)
- [Establishing triggers and actions to mitigate and/or compensate for legitimate claims for KWB impacts to agricultural supply wells and domestic wells.](#)

[Rosedale has adopted a similar plan to prevent, eliminate, or mitigate potential impacts from its projects; the plan is part of its Stockdale Integrated Banking Project Draft EIR dated April 2015. KWBA expects that an agreement may be developed with Rosedale and the Pioneer Project for the coordinated implementation of long-term banking operations plans.](#)

C. Facilities – [2014](#)

1. Facilities Development Plans

KWBA’s purpose for development of the KWB was to permit the delivery, percolation, and storage of water in aquifers for later extraction, conveyance, and use for the benefit of the project participants.⁸ [By the end of 2005, KWBA’s construction plans for the KWB included the completion of a Master Plan, the repair and rehabilitation of existing wells under an energy conservation program funded in part by the State of California \(SB 583\), the expansion of the turnout and channel providing water to the W-4 pond, and the River Area Construction Project, as described in Table 4. Other recent activities include constructing fencing along the property perimeter and rehabilitating wells and replacing aging pipelines and proposed activities, including the construction of some new ponds, have been added to Table 4.](#)

Project	Years	Activity
KCWA Flood Emergency Program	1995	Construction of 3,034 acres of recharge ponds.
KWBA pond construction	1997	Construction of two emergency ponds (W-3 and W-4) totaling 1,013 acres, two berms approximately 7 miles long, associated structures, and piping (added 6,000 AF recharged from construction activities)
KWBA pond construction	1998-2002	Construction of 4,290 4,080 acres of recharge ponds, 19 new basins, 28.5 miles of new berms, and structures and piping in 1998.
Conveyance Pipeline	2001	Construction of 2-mile-long Strand Pipeline.
Master Plan	1999-2002	Rehabilitation of 10 existing wells, installation of 31 new wells, installation of pipeline to the new wells, and the construction of the Kern Water Bank Canal, that connects the Kern River and the California Aqueduct.
SB 583 Pump Repair and Well Rehabilitation	2002-2003	Repair and/or rehabilitation of 10 existing wells pursuant to this program, including the removal of existing well pumping equipment, well-testing, well-casing rehabilitation of some wells, pump repair or replacement, and the

⁸ The Kern Water Bank [Infrastructure Development, the Kern Fan Monitoring Committee, and Groundwater conditions](#), Dec. 14, 2004, [Appendix A](#), p. 2

Table 4. KWBA Development Projects		
Project	Years	Activity
Program		reassembly of the wells.
Expansion of the W-4 Pond Turnout and Channel	2003	Enlarged turnout structures and channel to the W-4 pond; included installation of additional weir boxes and the enlargement of the channel conveying water to the ponds.
River Area Construction Project	2004- 2005	Construction of eight additional recovery wells, pipelines for these eight wells and an additional seven wells, a conveyance pipeline to route the recovered water from these 15 wells to the Kern Water Bank Canal, and a lift station (100 cfs capacity) to convey water for recharge purposes to River Area ponds.
Fencing	2005- 2006	Constructed fencing along the perimeter of the property.
Well Replacement & Rehabilitation	2009, 2010	Replaced well 30S/25E-8J1 with 8J2. Rehabilitated wells 30S/24E-12H, 12R, 13C, and 13H. Constructed pipelines for the rehabilitated wells. Reconstructed pond C9.
Kern Water Bank Pipeline / Miscellaneous	2011	Replaced aging pipelines, improved the P-11 canal, installed piezometers, installed weir boxes, installed fencing along the KWB Canal, graveled roads, repaired well pumps, and installed telemetry links. Installed pipeline across the western portion of KWB Lands.
Well Replacement / Miscellaneous	2012	Drilled three replacement wells (30S/25E-9L2, 15L1, 18A2), installed weir boxes, installed fencing along the Kern Water Bank Canal, graveled roads, and repaired well pumps.
Well Pipelines and Miscellaneous	2013	Constructed pipelines for three replacement wells, installed barbed wire fencing in River area, installed weir boxes, graveled roads, and repaired well pumps.
Traveling Screen	2014	Installed a traveling trash rack screen at River Canal pipeline inlet.
Integrated Regional Water Management Program	2015- 2016	Design and future construction of approximately 190 acres of recharge ponds, three wells, and associated facilities (e.g., recovery pipelines, pumps, and motors).
Master Plan (Full Buildout)	2017	Design and future construction of approximately 862 acres of recharge ponds
Source: The Kern Water Bank Authority, HCP/NCCP 2003-Annual Reports and 2004-2005-Management Plans, May 1, 2004 and KWB Facility Master Plan, various years.		

2. Facilities Constructed [through 2014](#)

Since the transfer of the KFE property, KWBA has constructed recharge ponds, the Kern Water Bank Canal, extraction wells, and pipelines to convey recovered water from operational wells, and has rehabilitated some existing wells (Figure 6A). [Figure 6 shows facilities constructed through 2005.](#)

a. Recharge Ponds

In 1995, under the KCWA flood emergency program (see Section III.B) and prior to the formation of the KWBA, KCWA and the other future participants of the KWBA constructed approximately 3,034 acres of recharge ponds (Figure 3). From 1998 through 2002, 2003, KWBA constructed an additional 4,290 ~~4,080~~ acres of recharge ponds, some of which overlapped earlier constructed ponds, for a total net pond area of 7,114 acres. An additional 70 acres of ponds were constructed in 2009 for a total pond area of 7,184 acres. Of this total, 4,998 ~~4,699~~ acres of the recharge ponds constructed are located within the Recharge Sector and 2,186 ~~2,415~~ acres within the Farming Sector. The ponds consist of low earthen berms ~~levees~~ that pond water to depths of a few feet. This water percolates into the alluvial fan for recharge into the aquifer. Water flows between the ponds in small channels; operators control the flow with small weir boxes.

b. Recovery Wells

Sixty-five agricultural wells were present on the KFE property when it was acquired by the Department in 1988. At the time the property was transferred to KCWA, 31 of these wells were considered operable, although 3 of these were not connected to any conveyance facilities. The remaining 34 were idle wells in various states of disrepair.

KWBA has installed 44 ~~39~~ new wells in several phases to accommodate groundwater recovery. The first phase of 29 ~~34~~ wells and two replacement wells was completed in 2001. Eight additional wells were completed in early 2005, two wells were replaced in 2008-2009, and three more were replaced in 2013. KWBA also rehabilitated 14 ~~ten~~ existing wells and repaired an additional 13 wells. ~~As of December, 2006, a total of 79 wells are operable.~~ The construction of three additional replacement wells is under way. Once these wells are complete, a total of 88 wells will be operable (29 pre-transfer wells, 37 new wells, 10 replacement wells, and 12 rehabilitated wells). All KWB well pumps are electric.

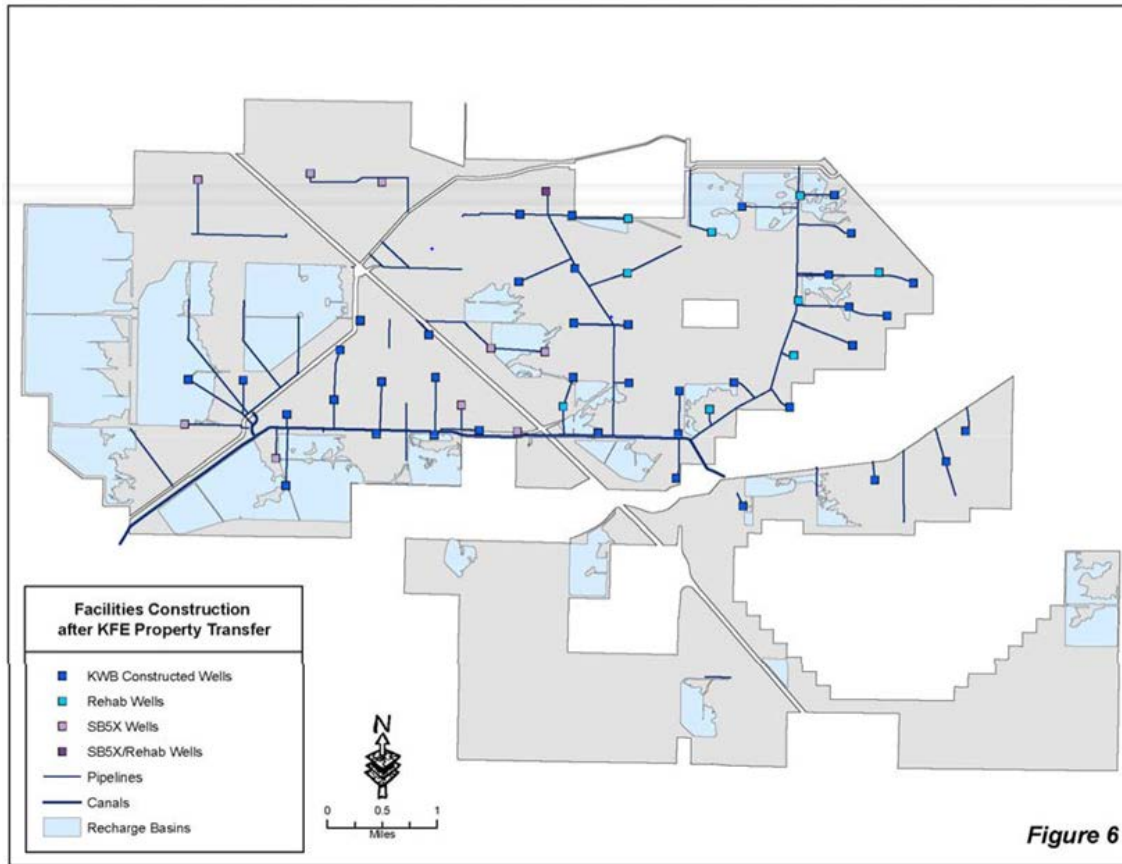


Figure 6

c. Conveyance Facilities

i. Primary Conveyance Facilities

The KWBA constructed the Kern Water Bank Canal from the Kern River to the California Aqueduct; the canal is approximately 6 miles long and 90 feet wide. Associated structures include headworks at the Kern River, a check structure, a 545 cfs pump station, and diversion facilities at the California Aqueduct. The canal is bi-directional and will receive or deliver about 800 cfs from or to the California Aqueduct or from the Kern River. The western reach of the canal is at the same elevation as the California Aqueduct; therefore, conveyance of water through the western reach does not require pumping energy. [In addition to delivering water to and from the KWB, the canal can also deliver water for others \(e.g., SWP water to West Kern WD recharge ponds, recovered water from the Pioneer Project to the California Aqueduct\).](#) KWBA began construction of the Kern Water Bank Canal in 1999 and completed the canal in ~~about October 2000~~ [January 2001](#).⁹

The KWBA installed small diameter (15" to 24") PVC pipelines to transport water recovered from extraction wells to existing canals or to large diameter (60") high-density polyethylene

⁹ ~~The Kern Water Bank: Infrastructure Development, the Kern Fan Monitoring Committee, and Groundwater Conditions. December 14, 2004.~~

pipelines.

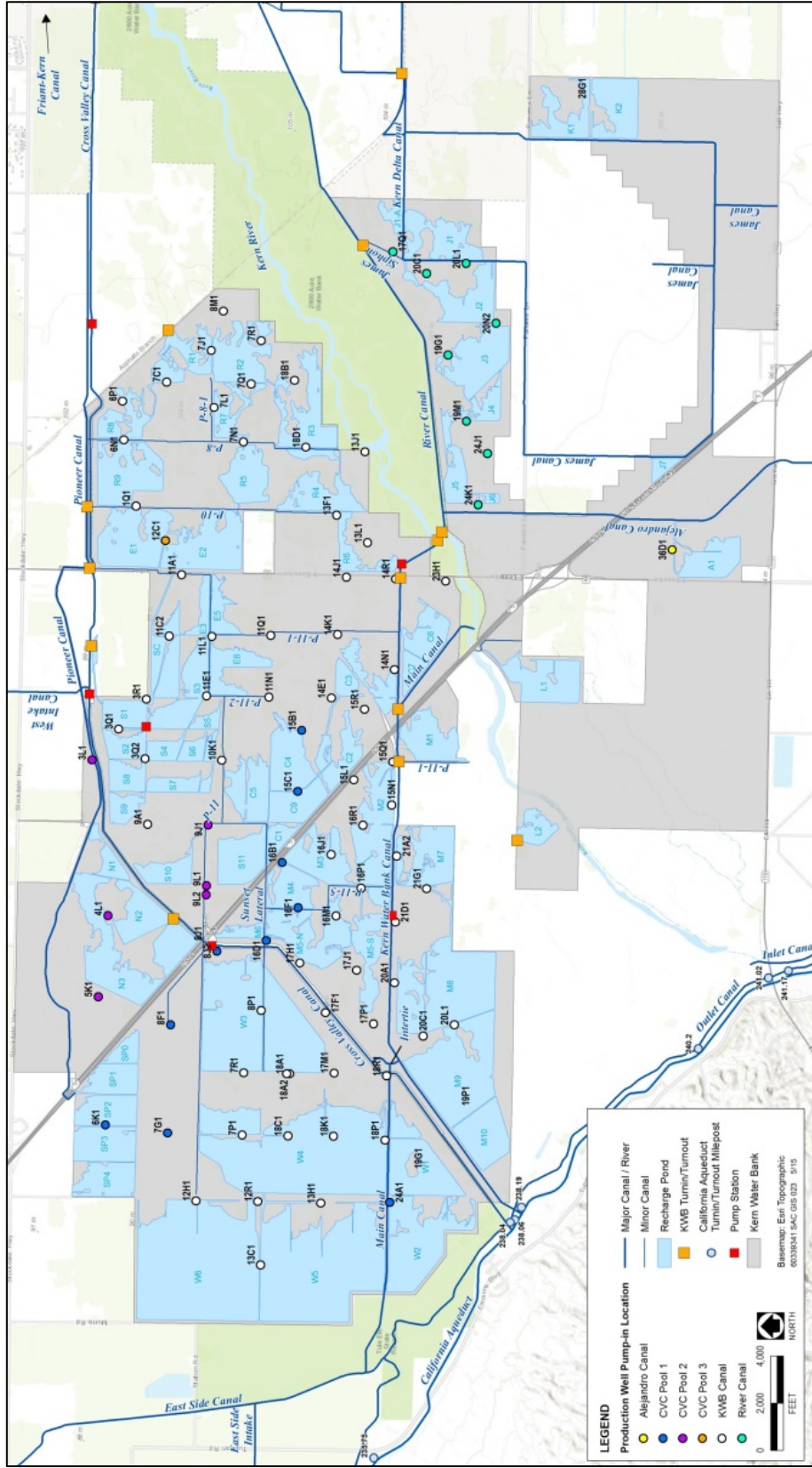
SWP water delivered to the KWB is delivered from the California Aqueduct to either the KWB Canal or CVC. This water is then typically delivered directly via turnouts from both of these canals to groups of recharge ponds (Figure 6B). If supplies are substantial enough, water may be delivered from the CVC to the Kern River channel or the River Canal to reach KWB ponds in the southeastern portion of the bank. The Kern River channel and River Canal are the primary facilities used to deliver Kern River and Friant-Kern Canal (FKC) water to the KWB.

Recovered water is delivered either directly or by exchange from the River Canal, KWB Canal, and/or CVC to the California Aqueduct. The CVC is bi-directional; therefore, recovered water pumped into to the CVC may be exchange delivered west to the California Aqueduct, depending on demands or delivered to the east for participant use or exchanged. The Alejandro Canal is used to deliver water to and from one pond and one well.

The Department measures all deliveries to and from the California Aqueduct at the KWB Canal and CVC. KCWA measures all direct deliveries from the CVC to the KWB. KCWA, the City of Bakersfield, and/or BVWSD measure all other deliveries (e.g., the Kern River Channel and River Canal). All of these agencies reconcile delivery data where responsibilities are tiered (e.g., the Department and KCWA for the water to/from the California Aqueduct, or KCWA/City of Bakersfield/BVWSD for Kern River water).

ii. Secondary Conveyance Facilities

Secondary conveyance facilities include the Pioneer Project, the Pioneer and James Canals, and several former irrigation ditches (Figure 6A). Water to portions of the easternmost KWB Lands are delivered from the Kern River through the Pioneer Project to the KWB. Kern River diversion structures exist at Basins 9 and 10 of the City of Bakersfield 2,800-Acre Groundwater Recharge Facility, which ultimately conveys water through the North Pioneer Property and then onto KWB Lands via a diversion structure in the Pioneer Project berm and underneath a railroad trestle. The Pioneer Canal delivers water across the northern portion of KWB Lands to select ponds in the northwestern most portion of the bank, the James Canal delivers water from the Pioneer Project to ponds in the southeastern most portion of the bank, and the irrigation ditches distribute water to select KWB ponds throughout the bank. Weir boxes control flows in these facilities, as well as all flow between ponds.



Source: KCWA, 2014, AECOM, 2015.

Kern Water Bank Operations Facilities Map

Figure 6A

D. Land Use

The KWBA utilizes the lands of the ~~KWB KFE property~~ for various purposes. The ~~KWB Lands KFE property~~ is are used primarily as a water recharge and recovery facility. Numerous recharge ponds, wells, conveyance facilities, etc. (see Facilities section above) have been constructed on the property and its land use “purposes” have not changed since 1995.

In 1997, the KWBA initiated vegetation and restoration programs. The goal of these programs is to protect existing and newly established sensitive habitats for long-term management. Exotic pest plant control is also an important long-term management activity. Annual mowing, livestock grazing (both cattle and sheep), and prescribed burning are all utilized for vegetation management. Limited applications of selective herbicides are used in most years to help control exotic pest plants.

~~On a limited basis, KWBA has planted various plant species based on the HCP/NCCP. Cottonwoods, willows, and grasses are examples of species planted to enhance percolation within the recharge basins and for wildlife habitat.~~ The water banking activities have established habitat along the edges of recharge basins and earthen canals, where willows, cottonwoods, sedges, and other wetland vegetation have emerged. In retired farm areas that are returning to natural conditions, there is an increase in the number of species and individuals at the KWB, including listed species like Tipton kangaroo rats, and San Joaquin kit foxes.

Under the direction of CDFG, safflower ~~was is~~ farmed annually, usually around 70 acres, to enhance dove habitat and to be utilized in an annual dove hunt. In years with sufficient water, there ~~was is~~ also a CDFG sponsored waterfowl hunt on designated recharge ponds on the ~~KWB Lands KFE property~~. Neither of these activities are current activities on the KWB Lands.

Various oil and gas companies maintain use of parcels on the ~~KWB Lands KFE property~~ to exercise their mineral rights on the property. Since 1996, several oil company-related construction projects have occurred. For example, Chevron Pipeline Company in 1998 removed 44,227 feet of pipeline, of which 27,000 was on the ~~KWB Lands KFE property~~. Various companies enter the ~~KWB Lands KFE property~~ regularly to conduct maintenance-related surveys of their equipment and to ensure environmental compliance. If environmental issues are observed by the KWBA related to any oil or gas facilities, the representative companies are contacted immediately to ensure proper action.

As part of the monitoring undertaken by the KWBA in compliance with the HCP/NCCP, annual reports are issued summarizing land use by wildlife, any environmental take related to activities on ~~KWB Lands KFE property~~, and habitat and vegetation restoration efforts. There has been ~~only one~~ three occurrences of the take of an endangered species on the ~~KWB Lands KFE property~~. In 1995 and 1996, three Tipton kangaroo rats were caught during trapping efforts and temporarily relocated during the construction of the Kern Water Bank Canal, then placed back in the area alive and well after the construction was complete.

1. Mitigation Lands

The HCP/NCCP establishes permanent mitigation lands on the KWB Lands (see Table 1). These lands include a DWR Mitigation Parcel of 530 acres, and a KWBA Mitigation Parcel of 635 acres (which is part of the Compatible Habitat acreage shown in Table 1). As part of the mitigation effort laid out in the HCP/NCCP, agencies and qualified third parties are allowed to purchase Conservation Credits for projects that may cause temporary or permanent disturbance to lands that includes much of the San Joaquin Valley portions of Kern, Kings, and Tulare counties. For more information on this process, refer to the “Conservation Bank Agreement” included in Volume II of the HCP/NCCP.¹⁰ As of 2013, 1,266 of the one-acre 3,267 credits have been sold.^{iv(c)}

E. Proposed Facilities (2015 – 2030)

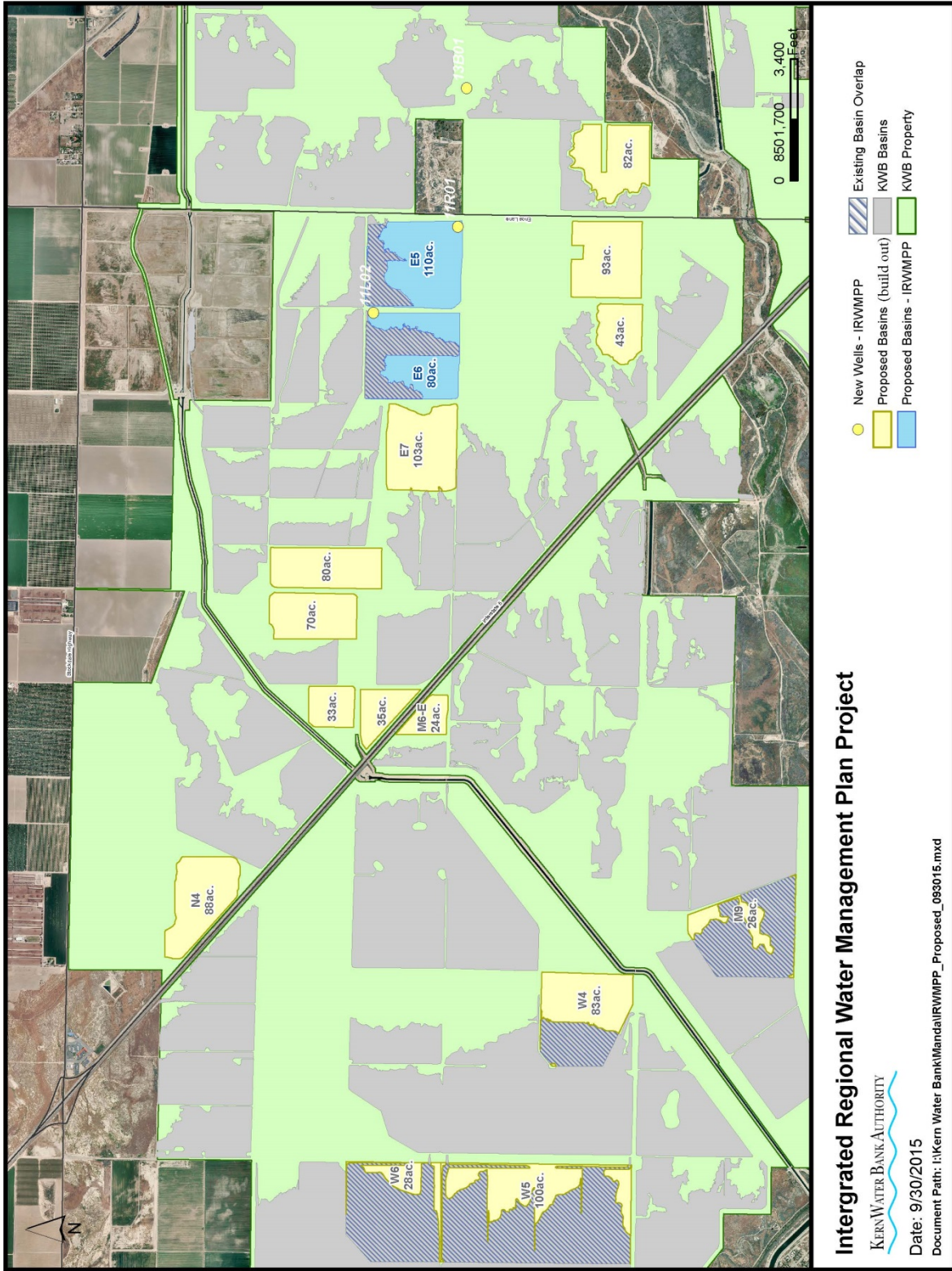
Near-term future KWB activities include construction of approximately 190 acres of recharge ponds and three wells under the ongoing Integrated Regional Water Management (IRWM) program (Kern Water Bank Recharge and Recovery Project). Longer-term future construction of approximately 862 acres of additional recharge ponds and associated facilities is anticipated as part of full build-out (see Figure 6B). In addition to the new recharge ponds, wells, and associated facilities, other potential ground-disturbing activities could include: fencing, constructing replacement recovery wells, installing and replacing pipeline, and installing weir boxes. Maintenance of existing and new basins, wells, and ancillary facilities would also take place. The IRWM program ponds have been sited. The locations of additional ponds are approximate but consistent with the KWB HCP/NCCP requirements; final locations and areas will be determined as these facilities are designed.

KWBA has also issued a Notice of Preparation in 2012 for the proposed Kern Water Bank Conservation and Storage Project, which would use existing facilities to divert available unappropriated water from the Kern River to increase reliability and enhance the dry-year water supply of KWB participants through storage in the KWB.

No new water conveyance facilities to convey KWB-recovered water are anticipated to be constructed by KWB participants; KWB participants have facilities in place to convey and exchange recovered water.

A KWB Short-Term Storage Program has been proposed which would provide a joint use facility on KWB Lands for KWB participants, and also provide a second priority use for other KCWA member units. The program would consist of lift stations, turnouts, gates, and earth work necessary to temporarily store and return water to the California Aqueduct. It is estimated that approximately 5,000 AF could be stored and returned every 5 years, providing a new water supply to KWB participants. Although the proposed program was submitted for funding in response to the Tulare Lake Basin portion of the Kern County Integrated WRMP, project development and CEQA compliance has not been initiated and funding has not been received.

¹⁰ More information on this process is contained in the “Conservation Bank Agreement” included in Volume II of the HCP/NCCP, on file with the Department.



Source: KCWA, 2014, AECOM, 2015.

Future Recharge Ponds

Figure 6B

VI. KWBA's KWB Operations

A. Overview of Kern County Water Operations Sources and Water Management

This section provides an overview of water sources ~~general water operations~~ within Kern County and an overview of how water is exchanged, transferred, and accounted for among Kern County water districts. While other water districts' ~~these~~ operations are not directly related to the KWBA's KWB operations, this overview is intended to provide some background for general water operations within the county, and some context for how KWB operations fit within that complex water management system.

1. Water Sources

Kern County residents have historically used surface water primarily from three sources: the Kern River and other local streams, SWP, and CVP. The SWP delivers water from the north via the California Aqueduct. The CVP delivers water from the north via the California Aqueduct and Cross Valley Canal, and from the central Sierra via the Friant-Kern Canal. The Kern River system and other local streams drain the southern Sierra. Local conveyance facilities, including the Kern Water Bank Canal, Cross Valley Canal, and Pioneer Canal, can be used convey water from these primary sources to various parts of the KWB Lands ~~KFE property~~.

a. Kern River and Other Local Streams

The Kern River has historically been a primary source of surface water to Kern County. North Kern WSD, Kern Delta WD, Buena Vista WSD, KCWA, and the City of Bakersfield are ~~the~~ ~~major~~ holders of Kern River surface water rights.

In most years, water users divert all Kern River flow downstream from its entrance to the valley, northeast of Bakersfield, and as a result the river channel through the KWB Lands ~~KFE property~~ is typically dry. However, in extremely wet years, the Kern River Intertie diverts Kern River flows into the California Aqueduct to prevent downstream flooding. From 1978 through 2006 (the latest date of flood flows), approximately 1.5 million AF have flowed through the Kern River Intertie into the California Aqueduct. ~~Since 1978, over 1,000,000 AF of Kern River water has flowed through the Kern River California Aqueduct Intertie. During the same period, an additional 430,000 AF of Kern River water bypassed the Intertie via the Kern River flood channel.~~ These flood flows have exceeded the available capacity of recharge facilities in Kern County since KCWA constructed the Intertie in 1977.

In very wet years the significant quantities of flood waters that otherwise would be diverted into the Intertie are available for recharge in the KWB Lands ~~KFE~~ area. At other times, other pre-1914 appropriative water right holders can provide Kern River water for recharge in the KWB. Although these right holders are not partners in the KWB, KWBA participants may purchase Kern River water from them for storage in the KWB.

Water users can divert the flows of the Kaweah, Tule, and Kings Rivers stream groups on the east side of the San Joaquin Valley and convey the water via the Friant-Kern Canal to its terminus.

From the terminus, water users can release the water into the Kern River channel or through various connections into the Cross Valley Canal. As with Kern River water, pre-1914 appropriative water right holders can provide Kaweah, Tule, and Kings Rivers water for recharge in the KWB. Although these right holders are not partners in the KWB, KWBA participants may purchase water from them for storage in the KWB. [The availability of this water depends on runoff, upstream reservoir storage capacity, in-river uses, irrigation demand, and FKC capacity. Historically, if not diverted into the FKC, these waters would have eventually flooded the Tulare Lake bed \(located north of the Kern River\).](#)

b. SWP

The SWP is a large source of non-local water for Kern County. [As of 2014](#), KCWA has a SWP Table A amount of [982,730](#) ~~998,730~~ AF. Thirteen Kern County member agencies contract for this water from KCWA, and KCWA has retained a portion for itself and its Improvement District No. 4 (Table 5). Dudley Ridge WD, an SWP contractor located in Kings County, ~~currently~~ has a SWP Table A amount of [45,350 AF for the year 2014](#) ~~57,343 AF~~.

Table 5. KCWA Member Units That Hold Contracts With KCWA to Receive SWP Table A Water	
Agency	Contractual Table A Amount (AF)
Belridge WSD	121,508
Berrenda Mesa WD	92,600 108,600
Buena Vista WSD	21,300
Cawelo WD	38,200
Henry Miller WD	35,500
KCWA	8,000
Kern Delta WD	25,500
Lost Hills WD	119,110
Improvement District No. 4	82,946
Rosedale-Rio Bravo WSD	29,900
Semitropic WSD	155,000
Tehachapi-Cummings County WD	19,300
Tejon-Castac WD	5,278
West Kern WD	31,500
Wheeler Ridge-Maricopa WSD	197,088
Total	982,730 998,730
Source: KCWA, 2014 2006 .	

KCWA and Dudley Ridge WD can recharge SWP Table A and Article 21 water when they have SWP water in excess of their immediate in-district [demands \(for more on these two water types, see Monterey Plus FEIR Chapters 13 and 14\)](#). They can also transfer or exchange water with other agencies to increase or reduce their water supplies in a year, or participate in arrangements that change the year of water deliveries.

c. CVP

CVP contractors in Kern County may receive water via the Friant-Kern Canal or the Cross Valley Canal, either directly or by exchange or transfer according to contract provisions with Reclamation.¹¹ Arvin-Edison WSD, Delano-Earlimart ID, Shafter-Wasco ID, and Southern San Joaquin MUD have Friant Division long-term contracts with USBR.

Reclamation's contracts with Friant-Kern contractors include a two-class system of water allocation. Municipal and industrial (M&I) and agricultural water users who have limited access to good-quality groundwater have Class 1 contracts, which are based on a firm water supply. Reclamation delivers the Friant-Kern's first 800 TAF of annual water supply under Class 1 contracts.¹² Class 2 water is a supplemental supply; Reclamation delivers Class 2 water directly for agricultural use or for groundwater recharge, and these are areas that generally experience groundwater overdraft.

In addition to Class 1 and Class 2 water deliveries, Reclamation delivers water that would otherwise be released for flood control purposes. Section 215 of the Reclamation Reform Act of 1982 authorizes the delivery of unstorable irrigation water that would be released in accordance with flood control criteria or unmanaged flood flows. Reclamation's delivery of Section 215 water has enabled contractors to recharge more water for groundwater replenishment than could otherwise be supported with only Class 1 and Class 2 contract deliveries.

In addition to the Class 1, Class 2, and conjunctive management aspects of Friant Division operations, some districts often arrange annual water transfers with other districts. These transfers provide opportunities to improve water management within the Friant service area. In wet years, districts that have water surplus to their needs can transfer water to other districts with the ability to recharge groundwater. Conversely, in dry years, districts that store water can return water to districts with little or no groundwater supply; these arrangements provide an informal groundwater banking program within the Friant Division.

KWBA participants do not have long term contracts for CVP water, but have purchased Section 215 and other flood waters from the CVP system through temporary contracts with Reclamation.

2. Water Management Exchanges and Landowner Transfers

Water transfers and exchanges have historically been and continue to be a regular part of water management in the San Joaquin Valley. Transfers are one-way transactions, where water from one agency is transferred to another, with no future return of that water. For KCWA, transfers with another agency are typically "landowner transfers," where a landowner that owns land within both KCWA and another agency's service area wants to transfer the water available to it from one agency for use on its land in the other agency's service area. Exchanges are two-way transactions, where water from one agency or source is delivered to another agency, in exchange for the return of a specified quantity of water. An exchange may involve a change in

¹¹ While CVP [Contract](#) water can be delivered to the KWB through the Cross Valley Canal, [no](#) such deliveries [were](#) ~~are not considered further in this study because, to date, no excess water has been~~ [from 1996 through 2005](#) for KWB recharge from this source.

¹² USBR and DWR, 2003, Upper San Joaquin River Basin Storage Investigation, Phase 1 Investigation Report.

the timing of delivery of water (e.g., water from one agency is delivered to another, in exchange for water from the other agency delivered later that year or in a following year), or a change in the source of water delivered (e.g., water from a source available to one agency is delivered to another, in exchange for water from a different source). These transactions can provide a number of benefits, including improved water management, reduced costs for water delivery, and/or improved water quality.

3. Water Sales

Table 6 gives an account of water sales by KCWA member agencies and other entities within Kern County to the Environmental Water Account (EWA) in the years 2000 and 2001. The Environmental Water Account (EWA) accounted for almost 50% of KWB participant sales during that period (see Monterey Plus DEIR Section 6.3.2 for more detail on the EWA). The table gives the SWP water exchange total for both 2000 and 2001, lists the seller and their amount (in AF), the type of water banked, which facility or agency banked the water, and the date the water was released to the EWA. EWA sales continued for most years between 2000 and 2007, but ceased at the end of 2007 due to an expiration of the EWA Operating Principles Agreement among the five State and federal agencies. Figure 9A and Table 9A show the amounts of water that KWB participants sold to the EWA program through 2007. Similar quantities were sold in 2002, 2003, and 2007, with lesser amounts sold in 2004 and 2005. These sales were a significant portion ~~are representative examples of the types of the~~ water sales that occurred from the KWB Kern County groundwater banks from 1996 through 2007.

Other KWB participant water sales include water that went to agricultural entities within the San Joaquin Valley, a wildlife refuge, and a power plant located within Kern County. In addition to these types of sales, 4 percent of the water recharged and stored at the KWB can be purchased by adjoining groundwater districts within Kern County for overdraft correction purposes (see Table 9A).

Total water sales during 1995-2014 totaled approximately 592,000 AF (Table 9A Rows 14-18). Sales were significantly reduced after 2007 due to the end of the EWA program and participant usage due to drier water years, and for the future are expected to stay at the same level or lower. During 2008-2014, a total of 72,500 AF of KWB water was sold (Table 9A). Of that amount, the KWB participants sold 10,750 AF (15%) to San Joaquin Valley agriculture entities, 19,850 AF (27%) to a power plant in Kern County, and 41,900 AF (58%) to KWB adjoining water districts for overdraft protection.

KWB participant water sales and transfers to non-KWBA members outside of Kern County occur infrequently; from 2009 through 2014, there were no out-of-county sales (Table 9A, Row 15). Sales outside of Kern County are evaluated on a case-by-case basis first by KCWA and typically have restrictions that limit these transactions.

Table 6. Sales by Kern County Entities to the Environmental Water Account in 2000 and 2001				
Seller	Amount (AF)	Banked Groundwater Type	Groundwater Banking Facility or Agency	Date Water Released to EWA
2000 SWP Table A Allocation Exchange Water Purchased and Delivered in 2000				
Kern Water Bank Participants	31,555	Friant-Kern Flood	KWB	7/00
Kern Water Bank Participants	40,725	Kern River Flood	KWB	8/00
2000 SWP Carryover Table A Allocation Exchange Water Purchased and Delivered in 2001				
Arvin-Edison	10,000	Friant-Kern Flood	Arvin-Edison WSD	3/01
Rosedale Rio Bravo	19,036	Friant-Kern Flood	Rosedale Rio Bravo WSD	3/01
Westside Mutual Water Co.	15,000	SWP Table A Allocation	KWB	3/01
2000 SWP Exchange Subtotal			116,316	
2000 SWP Table A Allocation Exchange Water Purchased and Delivered in 2001				
KCWA for Nickel Family LLC ¹	10,000	Kern River Flood	Pioneer Project	5/01
KCWA/ID 4	10,000	Kern River Flood	KWB	6/01
Buena Vista/ Rosedale/ West Kern	20,218	SWP Table A Allocation	Buena Vista WSD	5/01
Buena Vista/ Rosedale/ West Kern	1,000	SWP Table A Allocation	Buena Vista WSD	5/01
Buena Vista/ Rosedale/ West Kern	2,500	SWP Table A Allocation	Buena Vista WSD	7/01
Semitropic WSD	10,767	SWP Table A Allocation	KWB	10/01
Semitropic/ Tulare ID	4,233	Friant-Kern ²	Semitropic WSD	11/01
Westside Mutual/Tejon Castaic	21,000	SWP Table A Allocation	KWB	10/01
Cawelo WD	5,000	SWP Table A Allocation	KWB ³	11/01
2001 SWP Exchange Subtotal			84,718	
2000 & 2001 Total			201,034	

¹ The Nickel Family LLC is a private company primarily invested in farming. Nickel was the owner of a pre-1914 Kern River Water Right, referred to as the Lower River Water Rights. KCWA recently purchased the Lower River Rights from Nickel, and as part of the deal, Nickel is supplied with 10,000 AF of water per year by KCWA. Nickel banks this water in KCWA's portion of the Pioneer Project.

² Tulare ID delivered non-CVP water to Semitropic WSD via a Friant-Kern exchange.

³ Westside Mutual pumped its KWB account in exchange for a like amount of Cawelo's 2800-acre account that was assigned to Belridge on behalf of Westside Mutual.

Source: KCWA 2002

[NOTE: This table is not updated due to the ending of the EWA program in 2007. Table 9 presents EWA information through 2005. See Table 9A for recharge and recovery data through 2014.]

B. KWB Banking Operations

This paragraph describes the use of Tables 9 and Table 9A within this Revised Appendix E. In the DEIR Appendix E, Table 9 was used to generate Figures 7, 8, 9, 12, and 13. These figures are retained here as a representation of historical operations during 1996-2005. New Figures 7A, 8A, 9A, 12A, and 13A rely on updated operations data from Table 9A for the period 1996-2014.

It is important to explain here the reconciliation of water data by KWBA and KCWA within a year and even after several years. While Tables 9 and 9A may have some numbers that are different in years 1996-2005, the magnitude of water recharged and recovered is the same. For Figures 7 and 7A, for example, the magnitude of SWP water delivered to the KWB is comparable.

1. Recharge Operations

The recharge ponds are designed into several systems, consisting of a chain of basins that are interconnected by canals. Within each chain, which may change from time to time, the water flows from basin to basin through an interbasin structure which controls the water level in the preceding basin and the flow rate to the next basin in the chain. To the extent possible to prevent impacts on nesting birds, the basins are kept at a constant level during March through July, except for the basins at the end of a chain which are used to accommodate fluctuating flows.

From 1995 through 2005, KWBA delivered approximately 1.3 million AF of water for recharge. Most of this recharge occurred during 1995-1998 and 2005 (see Figure 7). From 1995 through 2014, approximately 2.1 million AF of water was delivered to the KWB for recharge. Most of this recharge occurred during 1995-1998, 2005-2006, and 2011 (Figure 7A). As would be expected, the volumes of water available for recharge are dependent upon California's annual water conditions. Table 7 shows the annual variability of statewide precipitation, Tulare Lake regional precipitation, SWP allocations, and CVP allocations from 1995 through 2014.

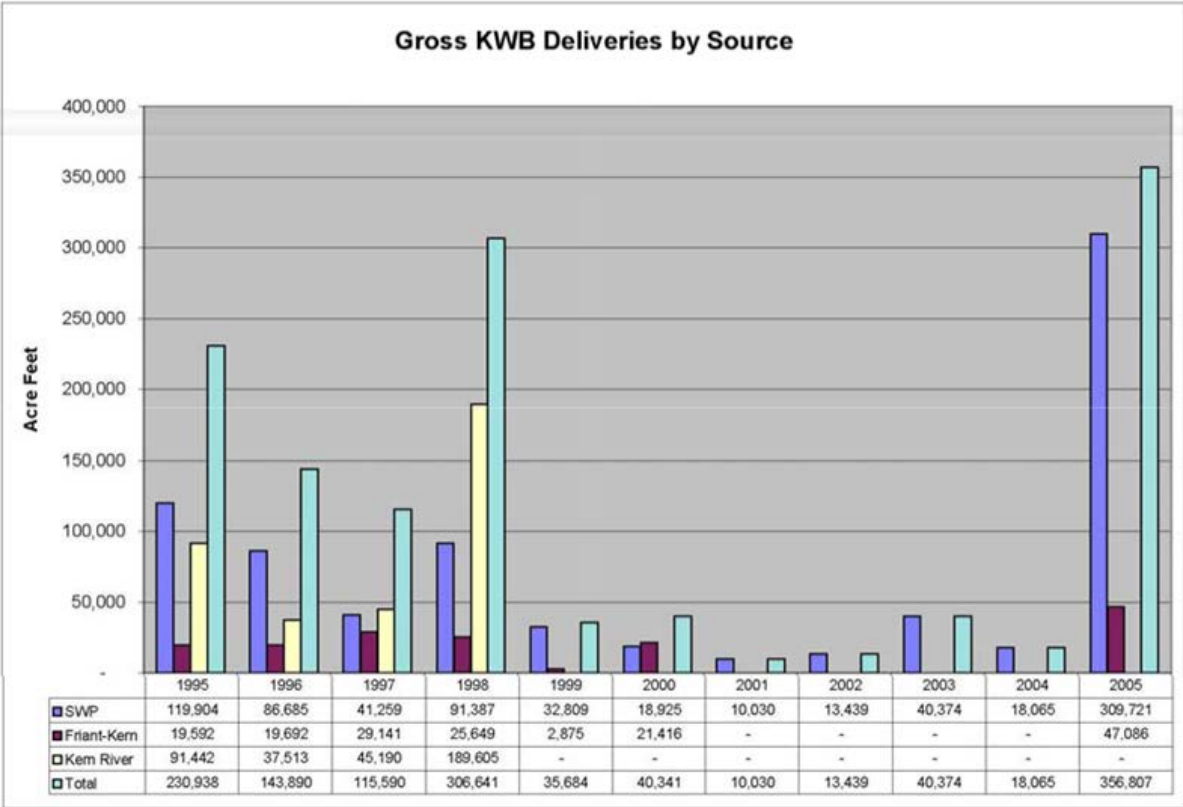
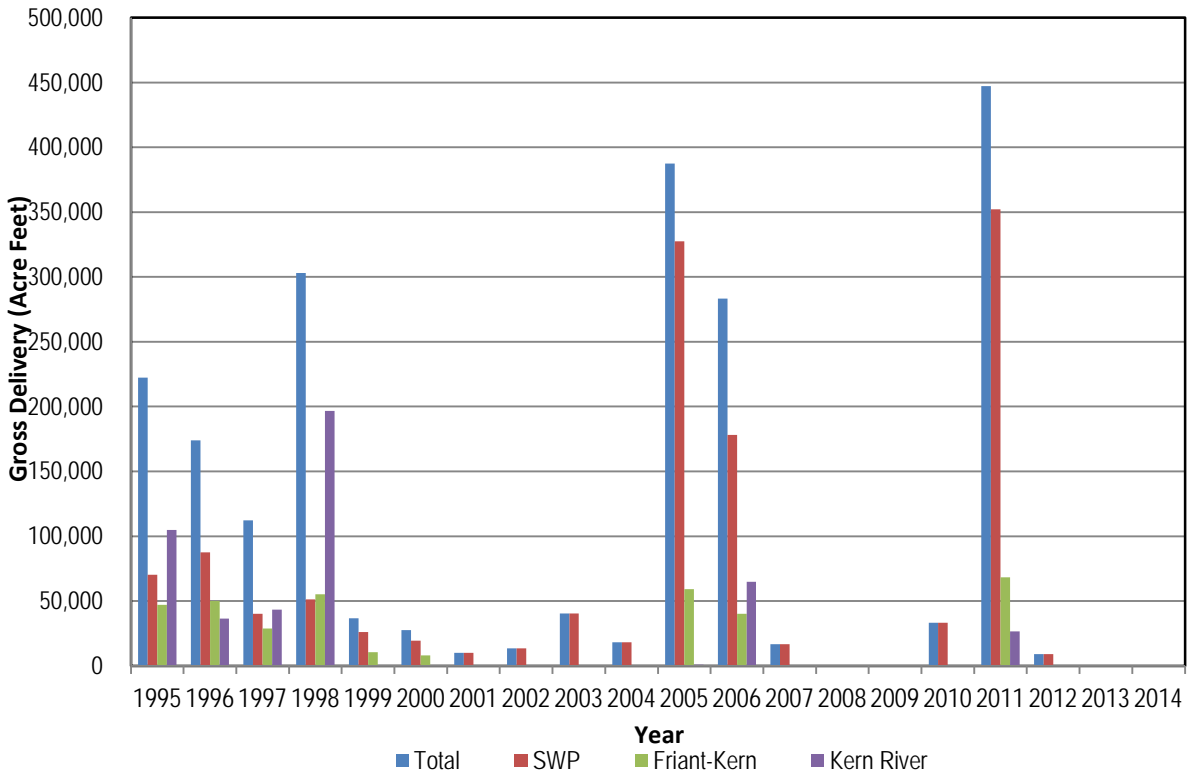


Figure 7



Source: KWBA, 2015.

Gross KWB Deliveries by Source

FIGURE 7A

Year	State-wide Precipitation (% of average)	Tulare Lake Hydrolog. Region Precipitation	SWP Allocation (% of Table A request)	CVP Friant-Kern Allocation (Class 1/ Class 2)	Kern River Flows¹³ (AF)
1995	165	165	100	100/100	1,240,895
1996	115	105	100	100/58	953,127
1997	125	130	100	100/60	1,160,099
1998	170	190	100	100/10	1,533,906
1999	95	80	100	100/20	410,403
2000	100	95	90	100/17	465,213
2001	75	60	39	100/5	495,616
2002	75	80	70	100/8	350,547
2003	111	108	90	100/5	457,176
2004	88	66	65	100/8	421,423
2005	139	132	90	100/Uncontrolled	1,089,497
2006	136	129	100	100/Uncontrolled	1,043,819
2007	65	54	60	65/0	274,070
2008	80	79	35	100/5	502,431
2009	81	78	40	77/18	456,813
2010	108	114	50	100/15	794,932
2011	135	152	80	100/20	1,395,025
2012	7	75	65	50/0	383,394
2013	79	59	35	62/0	220,172
2014	56	48	5	0/0	177,552

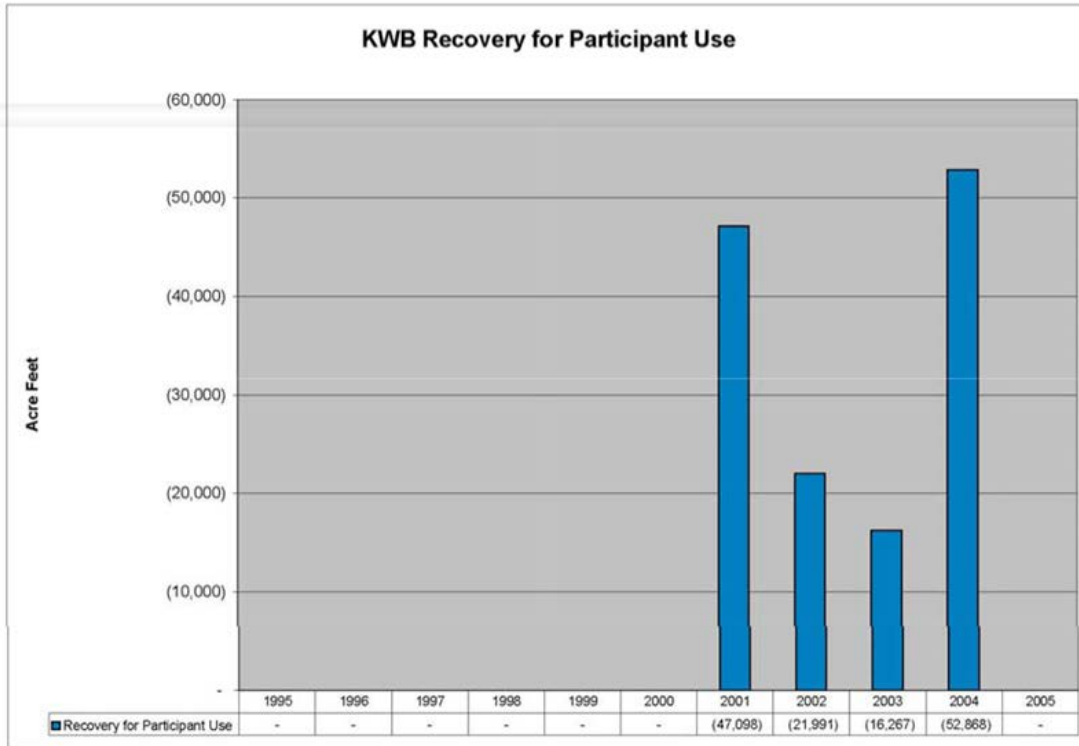
Source: DWR: CDEC, USBR (http://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf)

Table 8 provides a summary of gross deliveries for recharge by source, as of December 31, 2005. Sixty percent of the deliveries were SWP water, 27 percent were Kern River water, and 13 percent were Friant-Kern water. [Table 8A recharge percentages from 1995 through 2014 are relatively similar.](#)

SWP (AF)	Friant - Kern (AF)	Kern River (AF)	Total (AF)
782,598	165,451	363,750	1,311,799
60%	13%	27%	na

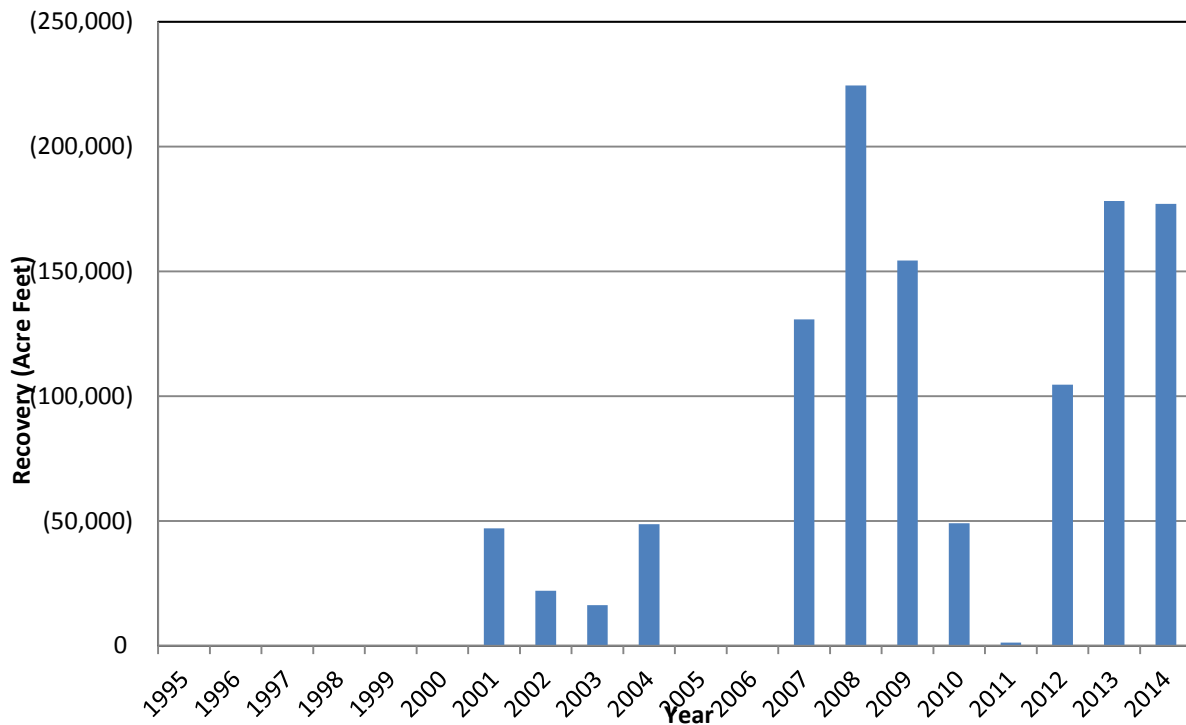
SWP (AF)	Friant - Kern (AF)	Kern River (AF)	Total (AF)
1,292,956	367,382	474,100	2,134,438
61%	17%	22%	na

¹³ Kern River downstream of Lake Isabella (Source: CDEC)



Data from Table 9, row 8. Includes Recovery by Pumping for Participant Use and Recovery by Exchange for Participant Use. See Figure 9 for further explanation for Recovery by Exchange for Participant Use.

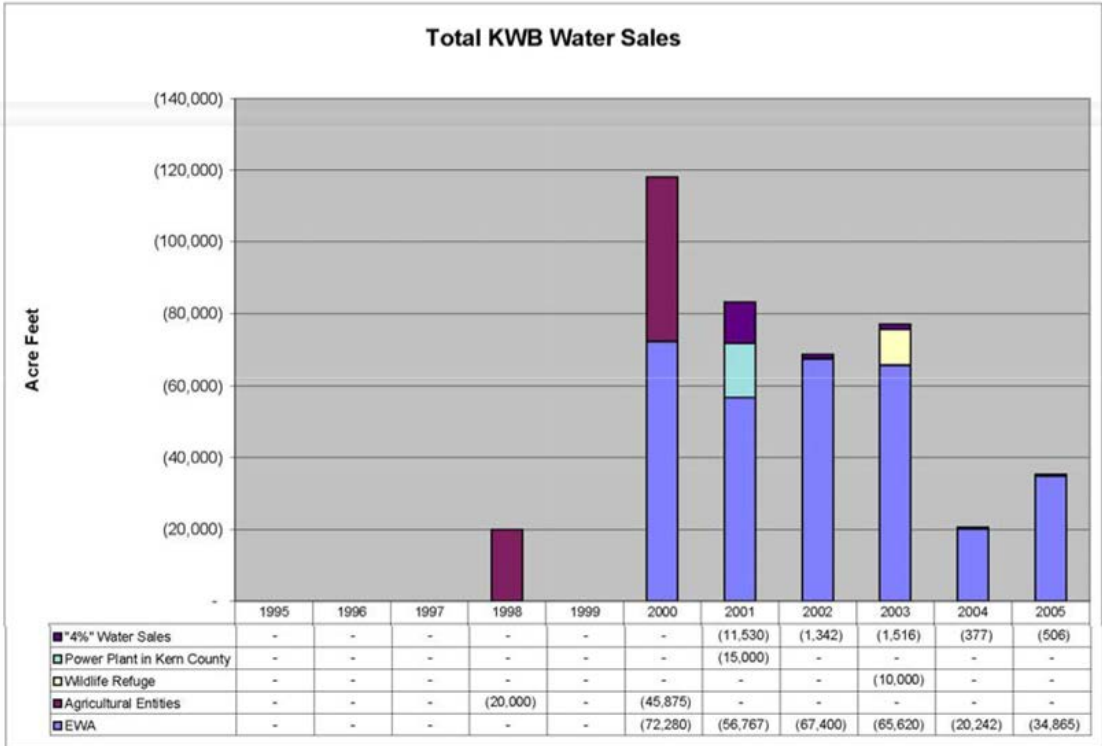
Figure 8



Source: KWBA, 2015.

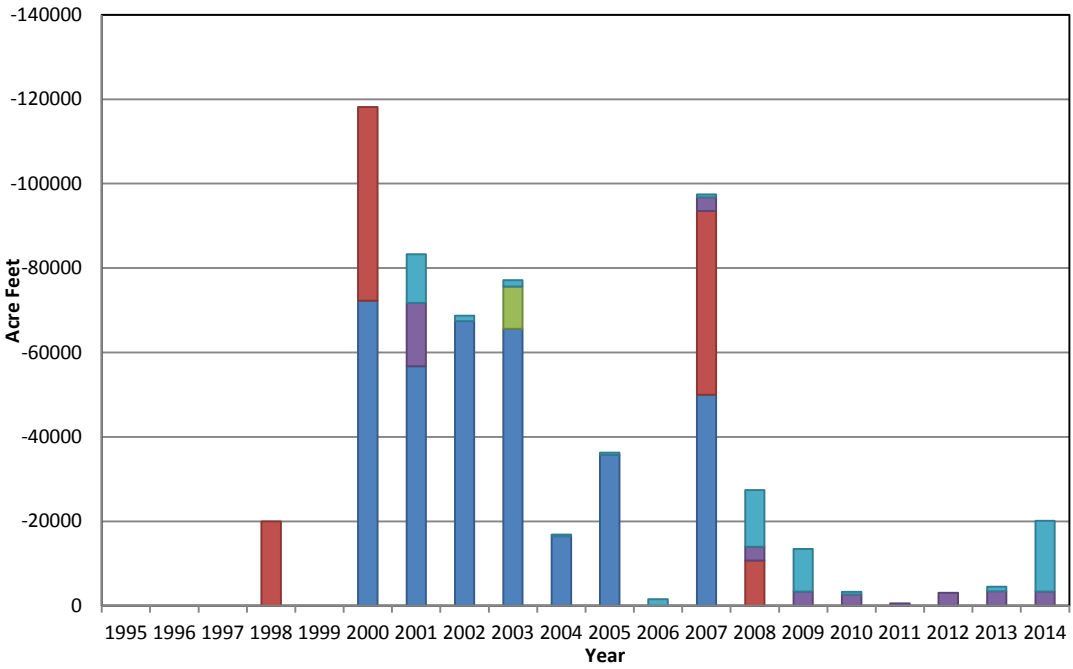
Kern Water Bank Recovery for Participant Use

FIGURE 8A



Data from Table 9, rows 14 through 18. Includes Recovery by Exchange for Water Sales. See Figure 11 for further explanation of Recovery by Exchange for Water Sales.

Figure 9



Source: KWBA, 2015.

Total KWB Participant Water Sales

FIGURE 9A

Water delivered to recharge ponds is subject to losses by evapotranspiration. As prescribed in the KWB MOU, 6 percent evapotranspiration losses are deducted from all gross deliveries to KWB recharge ponds to determine the net amount of these deliveries that is recharged and stored. Annual gross deliveries for recharge and net recharge after losses are shown in Tables [9 and 9A](#), rows 1 and 2. Other changes to storage accounts, including miscellaneous acquisitions of stored water and exchanges between KWB participants, are shown in rows 3 and 4.

2. Recovery Operations

Water stored in the KWB has been recovered by the KWB participants either for their direct use or for sale to others. From 1995 through 2005, recovery for participant use totaled 138,224 AF. All of this water was recovered during the dry years from 2001 through 2004 (see Figure 8).

During this same 1995 through 2005 period, water sales totaled 423,320 AF. About three quarters of these sales were to the EWA, with the remaining sales to:

- agricultural entities within the San Joaquin Valley,
- a wildlife refuge,
- a power plant located within Kern County,
- and the “4%” water made available to adjoining water districts for overdraft correction pursuant to the KWB MOU (see Figure 9).

All of these sales occurred in 1998 and 2000 through 2005. [Total water sales during 1995-2014 totaled approximately 600,000 AF and were mainly attributable to the EWA program. Sales in 2006-2007 were approximately 100,000 AF. Sales were significantly reduced after 2007 due to the end of the EWA program and participant usage due to drier water years \(Table 9A, Figure 9A\).](#)

[From 1995 through 2014, recovery for KWB participant use totaled approximately 1,153,500 AF \(Figure 8A\). A total of 1,141,200 AF was recovered by pumping during dry years 2001-2004, 2007-2010, and 2012-2014. The remaining recovery consisted of almost 11,000 AF for exchange during dry years and 1,250 AF for transfer as a water sale in 2011.](#)

Water stored in the KWB can be recovered by one of two mechanisms, 1) recovery by pumping or, 2) recovery by exchange. Recovery by pumping entails the physical pumping of water from the aquifer using the KWB’s groundwater wells. This type of recovery occurred in the dry years of 2001 through 2004. From 1995 through 2005, a total of 204,639 AF was recovered by pumping. Of this total, 132,099 AF was recovered for participant use and 72,540 AF for water sale (see Table 9, rows 6 and 9). [From 1995 through 2014, approximately 1,341,200 AF was recovered by pumping. Of this total, 1,141,200 AF was recovered for participant use and 200,000 AF for water sale \(Table 9A\).](#)

Stored water can also be recovered by exchange. For example, West Kern WD, which operates a separate banking project adjacent to the KWB, may need to recharge water at times when KWB participants need to recover water. Rather than recharge and recover water at the same time in

adjacent projects, West Kern WD's surface water is made available for KWB participant use, and a like amount of KWB stored water is shifted in the groundwater storage accounts from the KWB to West Kern WD. [KWBA and West Kern WD entered into an agreement in 2013 that updates a previous 2003 agreement, with the objectives of improving water security for both KWBA and West Kern WD, protecting water quality, and monitoring and mitigating potential threats to water supplies \(Appendix 7-5d\).](#)^{iv(d)}

Such exchanges may also occur between KWB participants. These exchanges reduce energy consumption and costs to both parties. From 1995 through 2005, a total of 326,634 AF was recovered by exchange. Of this total, 6,125 AF was recovered for participant use and 320,509 AF for water sales (see Table 9, rows 7 and 10). [From 1995 through 2014, a total of 336,154 AF was recovered by exchange. Of this total, 10,981 AF was recovered for participant use and 325,173 AF for water sales \(see Table 9A, rows 7 and 10\).](#)

3. Water Exchanges

[The KWBA participants also use](#) ~~Operational exchanges may be used~~ to increase the efficiency of both recharge and recovery operations. These exchanges can occur at two levels. The first would be a local exchange within Kern County coordinated entirely by KCWA. For example, one of the KWB participants might have Kern River water available to it at the same time that a participant in one of the adjacent Kern Fan banking projects has SWP water available to it. In this situation, the SWP water would be delivered to western banking facilities (e.g., the KWB) to reduce energy consumption costs, and the Kern River water would be delivered to eastern banking facilities (e.g., the Berrenda Mesa Project). However, the water recharged at the KWB would be accounted for as Kern River water, as if the exchange did not occur.

The second level of exchange that can occur uses facilities outside of Kern County, and typically requires the approval of the Department and/or Reclamation. For example, one of the KWBA participants might exchange its SWP Table A water for a like amount of CVP water available to a CVP contractor, such as Westlands Water District (WWD). In this situation, the Department would deliver the SWP Table A water to WWD via Reach 7 of the California Aqueduct in Kings County for use within the SWP service area, and Reclamation would deliver a like amount of CVP water to KCWA via the Friant-Kern Canal for recharge in Kern County banking facilities. As in the case of the local exchange described above, the water would be accounted for as if the exchange did not occur, or in this example, as SWP water.

4. Storage Accounting

The KCWA oversees all water transactions in Kern County and provides important water accounting for the banking projects in the Kern Fan area. An accounting of KWB storage activities from 1995 through 2005 is shown in Table 9, [and from 1995 through 2014 in Table 9A.](#) The tables [shows](#):

- Additions to Storage
 - Gross deliveries for recharge
 - Net amount recharged, after 6 percent evapotranspiration losses
 - Acquisitions (e.g., the portion of the Hacienda Program water transferred to KCWA as part of the KFE property transfer)
 - Exchanges between KWB participants

- Recovery for Participant Use
 - Recovered by pumping
 - Recovered by exchange (see Figure 10 for an explanation of the accounting for this type of exchange)
 - [Volume of water recovered by transfer \(e.g., in 2011, a groundwater transfer for sale of 1,250 AF was made from Westside Mutual Water Company to West Kern WD\)](#)

- Water Sales [\(a 5% loss is applied to out-of-county sales\)](#)
 - Categorized by method of recovery
 - Recovered by pumping
 - Recovered by exchange (see Figure 11 for an explanation of the accounting for this type of exchange)
 - Placed in trust (15,000 AF of stored water placed in trust for use by a power plant located within the service area of KWBA participant Wheeler Ridge-Maricopa WSD)
 - “4%” water sales (4 percent of stored water made available for purchase by water districts adjoining the KWB, for overdraft correction pursuant to the KWB MOU)
 - Categorized by use
 - EWA [\(program ended in 2007\)](#)
 - Agricultural entities in San Joaquin Valley
 - Wildlife refuge
 - Power plant located in Kern County [\(25,000 AF of contract water, plus 15,000 AF of stored water placed in trust\)](#)
 - “4%” water sales
 - Losses for water sales (5 percent losses are applied to all sales of water leaving Kern County, for the overall benefit of the groundwater basin pursuant to the KWB MOU)
 - Total storage reduction for sales (recovery by pumping for water sale, plus water placed in trust, plus “4%” water sales, plus losses for water sales)

The KWB storage balance is the net of additions to storage, minus recovery for participant use and total reductions for sales. These KWB activities and total storage balances are shown on an annual and cumulative basis in Figures 12 and 13, respectively. As of December 31, 2005, the KWB participants had a total cumulative balance of 1,050,778 AF of water stored in the KWB. [As of December 31, 2014, the cumulative balance was approximately 573,000 AF.](#)

Recovery by Exchange for Participant Use

Recovery by exchange for participant use is used to deliver water at times when a KWB participant wishes to recover water from the KWB at the same time an adjoining entity with a groundwater banking program has SWP water available in the California Aqueduct that it otherwise would have recharged. The exchange allows the delivery to occur without incurring energy costs or wear and tear on equipment. In the example shown below, 1,000 AF of water from an adjoining entity is physically delivered to the KWB participant's turn-outs. The 1,000 AF of water is deducted from the KWB participant's previously recharged supply and the adjoining entity's groundwater account is credited with 1,000 AF of water.

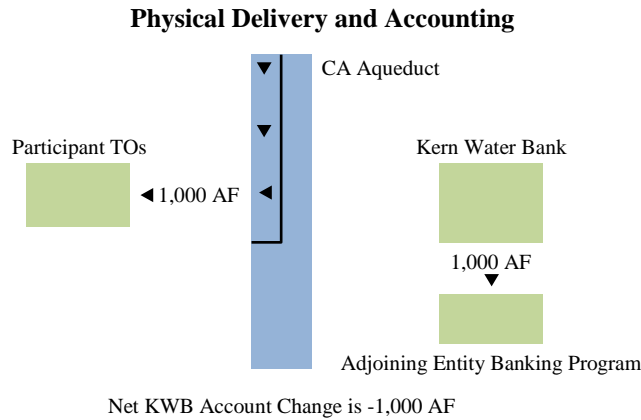


Figure 10

Recovery by Exchange for Water Sale

Recovery by exchange for water sale is used to deliver water at times when a KWB participant wishes to recover an exportable water supply from the KWB for sale to another entity, at the same time it has SWP water available in the California Aqueduct that it would have otherwise recharged. The exchange allows the delivery to occur without incurring energy costs or wear and tear on equipment. In the example below, 1,000 AF of water is physically delivered to the EWA in San Luis Reservoir. The KWB MOU prescribes a 5% loss to the groundwater basin for sales leaving Kern County. Therefore, in this example, a 5% loss of 50 AF is applied. For accounting purposes, 1,000 AF of water is deducted from the KWB Participant's previously recharged exportable supply for "delivery" to San Luis Reservoir, 50 AF is deducted from the KWB Participant's account for the 5% loss factor, and 1,000 AF is added to the KWB Participant's account as stored SWP water. In Tables 9 and 9A, the amount exchanged is shown as Recovery by Exchange for Water Sale (row 10), and for sales of water leaving Kern County, the 5% reduction for losses is shown as Losses for Sales (row 20).

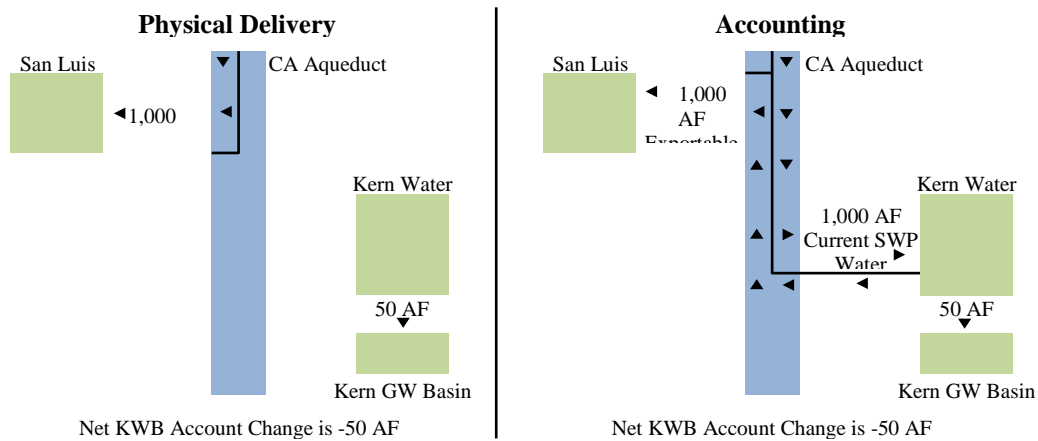
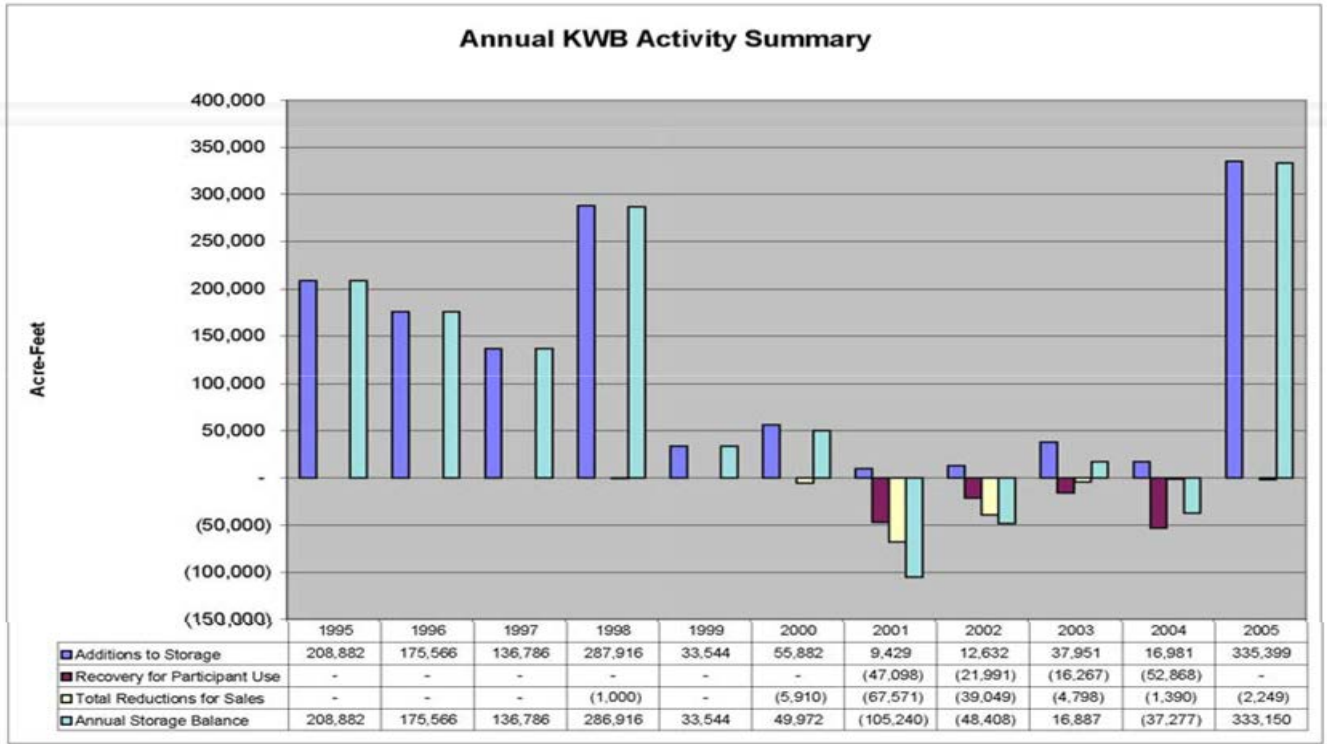
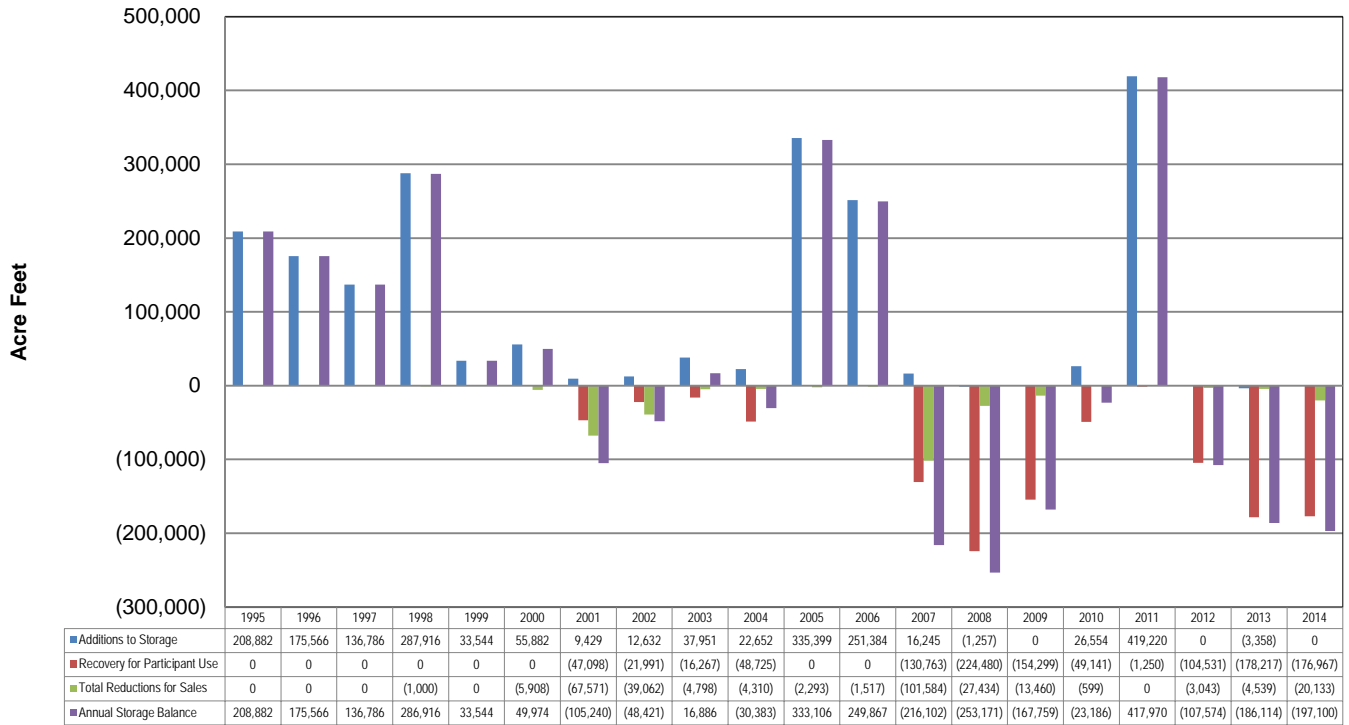


Figure 11



Data from Table 9, row 5, 8, 21, and 22.

Figure 12



Source: KWBA, 2015.

Annual KWB Activity Summary (1995-2014)

FIGURE 12A

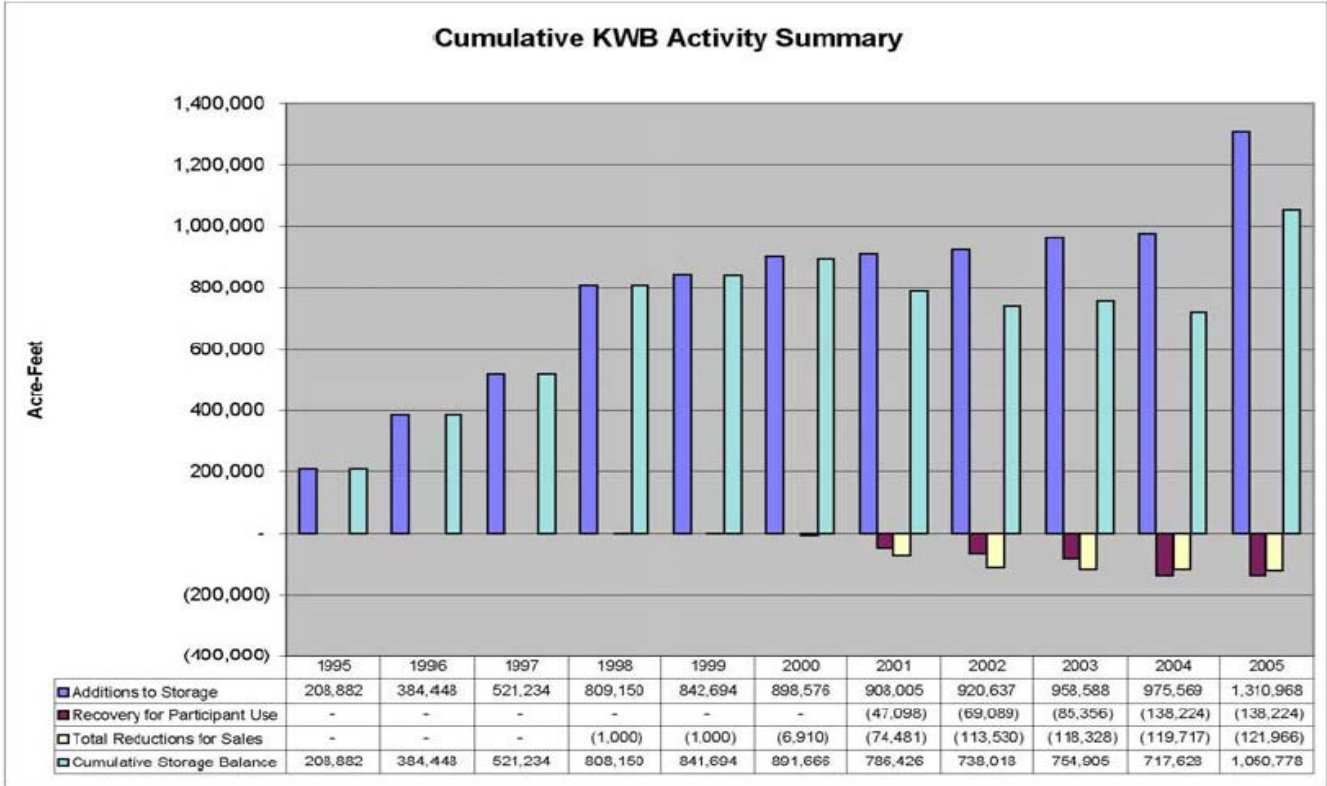
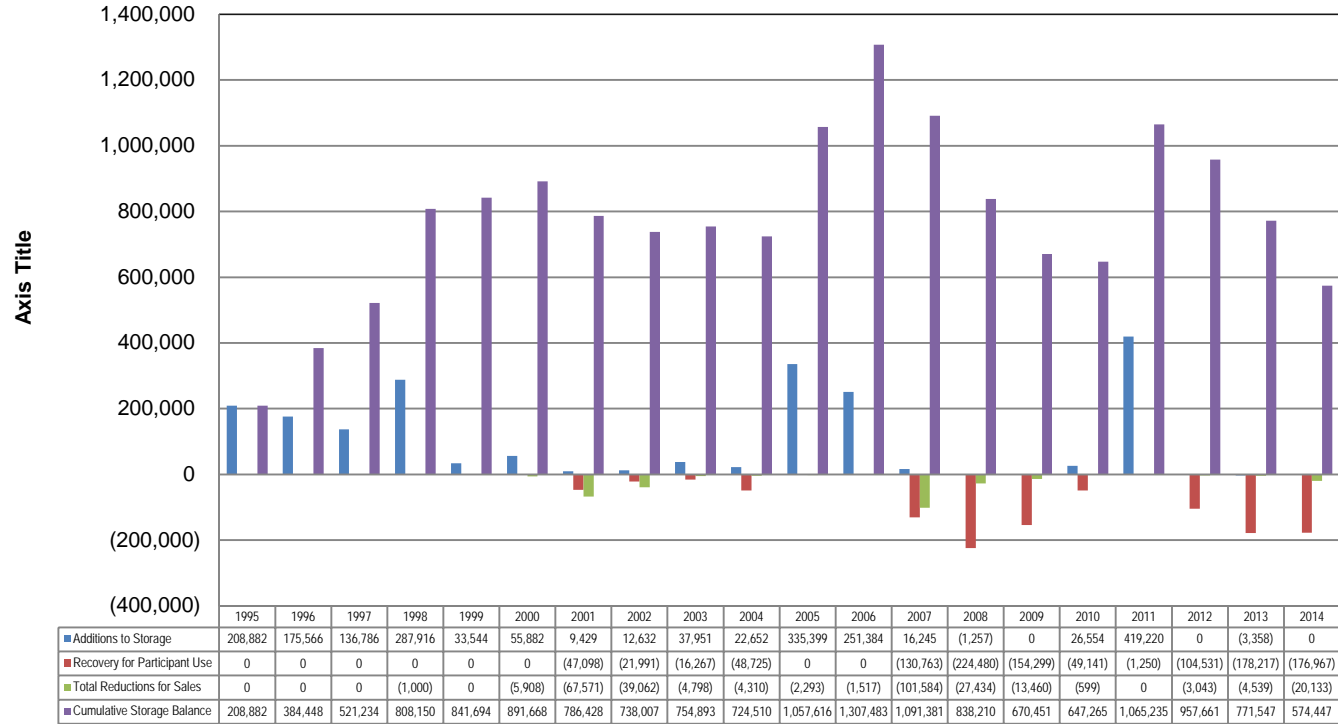


Figure 13



Source: KWBA, 2015.

Cumulative KWB Activity Summary (1995-2014)

FIGURE 13A

**Table 9.
KWB Account Summary**

Row	Formula	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 ⁶	2005 ⁶	Totals
Additions to Storage													
Recharge													
1		230,938	143,890	115,590	306,641	35,684	40,341	10,030	13,439	40,374	18,065	356,807	1,311,799
2	row 1 x .94	217,082	135,256	108,654	288,243	33,544	37,920	9,429	12,632	37,951	16,981	335,399	1,233,081
3		-	49,518	28,359	-	-	-	-	-	-	-	-	77,877
4		(8,200)	(9,208)	(227)	(327)	-	17,962	-	-	-	-	-	-
5	rows 2 + 3 + 4	208,882	175,566	136,786	287,916	33,544	55,882	9,429	12,632	37,951	16,981	335,399	1,310,968
Recovery for Participant Use													
6		-	-	-	-	-	-	(47,098)	(21,991)	(16,267)	(46,743)	-	(132,099)
7		-	-	-	-	-	-	-	-	-	(6,125)	-	(6,125)
8	rows 6 + 7	-	-	-	-	-	-	(47,098)	(21,991)	(16,267)	(52,868)	-	(138,224)
Water Sales													
Sales by Method													
9		-	-	-	-	-	-	(38,203)	(34,337)	-	-	-	(72,540)
10		-	-	-	(20,000)	-	(118,155)	(18,564)	(33,063)	(75,620)	(20,242)	(34,865)	(320,509)
11		-	-	-	-	-	-	(15,000)	-	-	-	-	(15,000)
12		-	-	-	-	-	-	(11,530)	(1,342)	(1,516)	(377)	(506)	(15,271)
13	sum rows 9 - 12	-	-	-	(20,000)	-	(118,155)	(63,297)	(68,742)	(77,136)	(20,619)	(35,371)	(423,320)
Sales by Use													
14		-	-	-	-	-	(72,280)	(56,767)	(67,400)	(65,620)	(20,242)	(34,865)	(317,174)
15		-	-	-	(20,000)	-	(45,875)	-	-	-	-	-	(65,875)
16		-	-	-	-	-	-	-	-	(10,000)	-	-	(10,000)
17		-	-	-	-	-	-	(15,000)	-	-	-	-	(15,000)
18		-	-	-	-	-	-	(11,530)	(1,342)	(1,516)	(377)	(506)	(15,271)
19	sum rows 14 - 18	-	-	-	(20,000)	-	(118,155)	(83,297)	(68,742)	(77,136)	(20,619)	(35,371)	(423,320)
20	add row 9 sales to 19	-	-	-	(1,000)	-	(5,910)	(2,838)	(3,370)	(3,282)	(1,013)	(1,743)	(19,156)
21	rows 19 + 20	-	-	-	(1,000)	-	(5,910)	(67,571)	(39,049)	(4,798)	(1,390)	(2,249)	(121,966)
KWB Storage Balance													
22	rows 5 + 8 + 21	208,882	175,566	136,786	286,916	33,544	49,972	(105,240)	(48,408)	16,887	(37,277)	333,150	1,050,778
23	row 23 ⁹ + row 22 ¹⁰	208,882	384,448	521,234	808,150	841,694	891,666	786,426	738,018	754,905	717,628	1,050,778	

1 Net Recharge is the amount of Gross Deliveries stored after deducting 6% for evapotranspiration losses. 2 Exchanges between KWB participants using existing KWB storage accounts. Note that there is no net change to KWB storage resulting from these exchanges. 3 Recovery By Pumping is stored water recovered by physically pumping it from wells. 4 Recovery By Exchange is stored water recovered by exchange with surface water available at the same time. See Figures 9 and 11 for further explanation. 5 Stored water placed in Trust for use by a power plant located within the service area of KCWA member agency Wheeler Ridge-Mantopa WSD. 6 "4%" Water Sales is 4% of stored water made available for purchase by water districts adjoining the KWB for overdraft correction, pursuant to the KWB MOU. 7 Losses for Sales are losses of 5% applied to all sales of water leaving Kern County, pursuant to the KWB MOU. 8 9 Data for 2004 and 2005 are preliminary and subject to minor revision. Total KWB Storage Reduction for Sales is Recovery By Pumping for Water Sale + Trust Account + "4%" Water Sales + Losses for Sales. Recovery By Exchange for Water Sale is not included in this total because it is an exchange with surface water supplies and so does not result in physical storage reductions (see Figure 11 for further explanation).

[NOTE: This Table 9 as shown in DEIR Appendix E is retained here as an historical table.]

Table 9A - KW8 Account Summary																									
Row	Formula	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Totals			
RECHARGE																									
Additions to Storage																									
1	Gross Deliveries-Total		173,875	112,262	303,086	36,753	27,579	10,030	13,439	40,374	18,065	387,557	283,233	16,728	8,918		33,131	447,148	8,918				2,134,438		
2a	Net Recharge (after 6% losses)-Participants		217,082	135,256	108,654	288,243	33,544	37,200	12,632	37,951	16,981	335,399	251,384	14,988			31,030	407,211					1,937,704		
2b	Net Recharge (after 6% losses)-Others ₂																	12,009					12,009		
2c	Net Recharge (after 6% losses)-Third Party ₂																								
3	Acquisitions - Purchases		49,518	28,359							5,671													83,548	
4a	Exchanges Between Participants ₂		(8,200)	(9,208)	(27)	(327)																		(977)	
4b	In Use, Exchanges or Transfer by Others ₂																								(6,857)
5	Total Additions to KW8 Storage	208,882	175,566	136,786	287,916	33,544	55,882	9,429	12,632	37,951	22,652	335,399	251,384	16,245	8,918	0	26,554	419,220	0	(3,358)	0			2,102,547	
Recovery for Participant Use																									
6	Recovery by Pumping for Participant Uses ₂						(47,098)	(21,991)	(16,267)	(42,600)				(130,763)	(224,044)	(152,621)	(46,185)			(104,531)	(178,217)	(176,567)	(1,141,284)		
7	Recovery by Exchange for Water Sales ₂									(6,123)				(436)	(1,678)	(2,956)	(1,250)							(12,445)	
8	Total Recovery for Participant Use		0	0	0	0	0	(47,098)	(21,991)	(16,267)	(48,723)	0	0	(130,763)	(224,480)	(154,299)	(49,141)	(1,250)		(104,531)	(178,217)	(176,567)	(1,153,729)		
Water Sales																									
SALES BY METHOD																									
9	Recovery by Pumping for Water Sales ₂						(38,203)	(34,337)		(3,109)				(96,777)	(14,018)	(3,466)				(3,043)	(3,478)	(3,364)	(199,733)		
10	Recovery by Exchange for Water Sales ₂				(20,000)		(118,155)	(18,564)	(35,063)	(75,630)	(13,368)	(35,734)				(2,706)	(588)							(317,798)	
11	Trust Accounts ₂						(15,000)																	(15,000)	
12	*4% Water Sales ₂						(11,530)	(1,355)	(1,516)	(377)	(506)	(506)	(1,517)	(679)	(13,416)	(10,054)	(599)					(1,061)	(16,769)	(59,379)	
13	Total Sales	208,882	175,566	136,786	287,916	33,544	55,882	9,429	12,632	37,951	22,652	335,399	251,384	16,245	8,918	0	26,554	419,220	0	(3,358)	0			(591,912)	
SALES BY USE																									
14	EWA						(72,280)	(56,167)	(67,400)	(65,620)	(16,477)	(35,734)												(364,278)	
15	Agriculture Entities						(45,875)							(43,507)	(10,750)									(120,132)	
16	Wildlife Refuge									(10,000)														(10,000)	
17	Power Plant in Kern County ₁																							(38,123)	
18	*4% Water Sales ₂						(11,530)	(1,355)	(1,516)	(377)	(506)	(506)	(1,517)	(679)	(13,416)	(10,054)	(599)					(1,061)	(16,769)	(59,379)	
19	Total Sales	208,882	175,566	136,786	287,916	33,544	55,882	9,429	12,632	37,951	22,652	335,399	251,384	16,245	8,918	0	26,554	419,220	0	(3,358)	0			(591,912)	
20	Losses for Sales ₂						(5,908)	(2,838)	(3,370)	(3,282)	(824)	(1,787)	(4,128)											(23,137)	
21	Total KW8 Storage Reduction for Sales ₂						(5,908)	(2,838)	(3,370)	(3,282)	(824)	(1,787)	(4,128)											(23,137)	
KW8 Storage Balance																									
22	Annual Storage Balance	208,882	175,566	136,786	286,916	33,544	49,974	(105,240)	(48,421)	16,886	(30,383)	333,106	249,867	(216,102)	(253,171)	(167,759)	(23,186)	417,970	(107,574)	(186,114)	(197,100)			574,447	
23	Cumulative Storage Balance	208,882	384,448	521,234	808,150	841,694	891,668	786,428	738,007	754,893	724,510	1,057,616	1,307,483	1,093,381	888,210	670,451	647,265	1,065,235	957,661	771,547	771,547			574,447	

Table 9A Notes:

1. Net Recharge is the amount of gross deliveries stored after deducting 6% for evapotranspiration losses.
2. Water recharged on KWB Lands for entities other than participants that is tracked within the KWB account.
3. Water recharged on KWB Lands for third parties that is not tracked within the KWB storage account.
4. Exchanges between KWB participants using existing KWB storage accounts. Note that there is no net change to KWB storage resulting from these exchanges.
5. Recovery by Pumping is stored water recovered by physically pumping it from wells.
6. Recovery by Exchange is stored water recovered by exchange with surface water available at the same time.
7. Stored water placed in Trust for use by a power plant located within the service area of KCWA participant Wheeler Ridge-Maricopa Water Storage District (WSD).
8. "4%" Water Sales is 4% of stored water made available for purchase by water districts adjoining the KWB for overdraft correction, pursuant to the 1995 KWB MOU.
9. Losses for Sales are losses of 5% applied to all sales of water leaving Kern County, pursuant to the 1995 KWB MOU.
10. Total KWB Storage Reduction for Sales is Recovery by Pumping for Water Sales + Trust Account + "4%" Water Sales + Losses for Sales. Recovery by Exchange for Water.

5. Operations Monitoring

As discussed in Section V.B.3, the KWB is operated under the requirements of the *Memorandum of Understanding Regarding Operation and Monitoring of the Kern Water Bank Groundwater Banking Program*, which provides for the establishment of an extensive monitoring program and a Monitoring Committee to oversee banking operations and the results of said monitoring. The committee is made up of several basin stakeholders including the KCWA and all adjoining water districts. The KWB is also operated and monitored in accordance with the Minimization of Impacts Requirements and other measures prescribed in the KWB HCP/NCCP and associated KWB Vegetation Management Plan (see Section V.A.2.b above and Appendices 7-7a and 7-7b, respectively). Pending resolution of the challenge to the Monterey Plus EIR, the KWB is operated in accordance with the Interim Operating Plan (see Section V.B.7 above and Appendix 7-5b).

a. Recharge and Recovery Monitoring

During times of recharge or recovery, KCWA operations and maintenance field personnel (on behalf of KWBA) travel to each water control structure or well to record flow, water levels, and other information, and periodically collect groundwater samples. Field personnel monitor and record flow in conveyance facilities and between ponds on a daily basis. Adjustments to weir boxes or gates are made as necessary to maintain efficient pond levels. During the pumping season, each well site is checked by a system operator on a regular basis for flow and electrical meter readings, for operation and maintenance checks on the well motor, pumps, and

electrical systems.¹⁴ Maintenance issues (e.g. seeping berms) are reported as soon as they are discovered.

b. Groundwater Monitoring

KWBA has used extensive monitoring to establish baseline groundwater quality and ensure that groundwater problems are not developing. This monitoring consists of two elements: 1) the regular sampling of ~~50~~57 dedicated monitoring wells for several potential constituents of concern, and 2) the sampling of all recovery wells according to a Monitoring Schedule developed by the Department of Health Services (now Department of Public Health [DPH]).

The water quality sampling of the monitoring wells is mandated by the KWB MOU. Under this program, water levels are measured at least semiannually, and water samples are analyzed for several potential constituents of concern at least annually. The results of this monitoring are reported to and reviewed by the Monitoring Committee to ensure that ~~excellent~~ groundwater quality is maintained and that areas of known poor water quality remain unchanged or improved as a result of KWB operations.

The second element of groundwater monitoring includes sampling the recovery wells according to a DPHS Title 22 Monitoring Schedule for wells providing water to municipal purveyors (KCWA, 1997). In addition to providing extensive information regarding groundwater quality, the results of this sampling are used to model expected changes in water quality in conveyance facilities receiving the recovered water.

c. Mitigation

As required as part of the 1995 KWB MOU (Appendix 7-5a), a Kern Fan Monitoring Committee was established to oversee banking operations and the results of said monitoring. The committee is made up of several Kern Fan Subbasin stakeholders including KWBA, KCWA, and all adjoining water districts (see Figure 1A).

A primary purpose of the Monitoring Committee is to evaluate groundwater information and determine if adverse impacts are likely to occur as a result of project operations. If the Monitoring Committee determines that adverse impacts are likely, then mitigation strategies are developed, as discussed in more detail in Section V.B.3. Through 2006, no~~No~~ mitigation measures had~~have~~ been determined necessary ~~to date~~.

On behalf of the Kern Fan Monitoring Committee, KCWA compiles monitoring data and reports hydrologic conditions, water supply, and groundwater banking activities within the Kern Fan into annual Kern Fan Monitoring Committee Area operations and monitoring reports.

Kern Fan water banking operations and monitoring program reports include annual and cumulative summaries of recharge and recovery banking and overdraft correction operations by project facility and participant, and surrounding areas. A summary of the recharge spreading

¹⁴ Kern Water Bank Authority, Kern Water Bank Master Plan & Economic Analysis, April 1998.

program deliveries by physical source, location, and participant are provided. Bank facilities/locations included in the report are Berrenda Mesa, Pioneer, City of Bakersfield 2,800-Acre Groundwater Recharge Facility, KWB, Poso Creek (downstream of the FKC crossing), and the Kern River channel (recharge area located between Manor Street and the Stockdale Bridge).

The reports also include hydrograph data and interpretive studies with maps displaying areas of facilities utilization, groundwater quality, surface elevation, flow direction, and water level changes. An annual water balance estimate and analysis is also provided. Water quality sampling data and evaluations of water quality constituents and areas of concern, salt balance ratios for the recharge and recovered water supplies, and water quality for pump-in blending operations are also included.

As mentioned in previous Section V.B.8, KWBA and Rosedale have developed an Interim Joint Operations Plan to monitor groundwater conditions in the project areas (Appendix 7-5b). Projected changes in water levels that may result from project operations are predicted with groundwater models, and under certain conditions mitigation measures may be considered.

C. Maintenance and Other Operations

1. Water Operations Facilities Management

The KWB HCP allows the KWBA to install, construct, repair, maintain, and operate water recharge, water recovery, and water conveyance facilities within the Recharge Basin Sector and the Other Water Banking Facilities Sector of the KWB. The management of these facilities is described in Annual Management Plans submitted to the wildlife agencies. These plans ensure that management activities comply with the HCP/NCCP's primary management tool, the Vegetation Management Plan, as well as the Minimization of Impacts Requirements, and other measures prescribed by the HCP (see Section V.A.2.b.). Management activities vary from year to year depending on annual rainfall and the extent of recharge/recovery operations.

Typical vegetation management activities include grazing, burning, and mowing in conformance with the KWB HCP/NCCP Vegetation Management Plan, the application of herbicides with hand sprayers at wells and gate structures, road grading, and fence repair. Vegetation along roads, berms, and canals is typically mowed once a year after nesting seasons. Tumbleweeds that have accumulated in ditches may be burned under permit from the San Joaquin Valley Air Pollution Control District. Aerial spraying of herbicides to rid stands of cattails in recharge ponds was conducted on a limited basis in 2006 and 2011. The cattails greatly increase pond evapotranspiration and can encourage mosquito populations.

Other maintenance activities include clearing trash racks of debris and clearing fence lines of vegetation. Minor berm repairs are occasionally required during recharge programs. These repairs entail rebuilding a short portion of the berm with a backhoe.

a. Recharge Ponds and Canals

Various recharge pond and canal maintenance activities are necessary for the continued operations of the KWB. These activities include vegetation management within the facilities, including grazing, mowing, and burning; aquatic weed management; vector and pest control; and removal of aquatic weeds and silt when interfering with recharge and conveyance activities.¹⁵ After windstorms, tumbleweeds will accumulate in the KWB Canal. These are removed primarily with backhoes.

Silt removal from canals is performed by excavators, backhoes, or loaders. According to KWBA, silt removal has not been required since 1995.¹⁶ However, silt removal from the recharge ponds may be necessary in the future.

During periods of recharge, maintenance of aquatic vegetation and algae blooms within canals, ditches, and recharge ponds is also necessary. Aquatic vegetation was especially problematic in 2008 in the eastern reach of the KWB Canal. Excess vegetation was removed by dragging a chain along the canal bottom and removing the vegetation with backhoes. Shortly thereafter, carp from the adjacent Kern River Canal entered the eastern reach of the canal, and aquatic vegetation problems subsided.

i. Mosquito Abatement Program

Westside and Kern Mosquito and Vector Control Districts (VCD) have maintained an active mosquito abatement program in coordination with KWBA. The 1997 Monterey Initial Study and Addendum includes implementation of a Mosquito Abatement Plan (Appendix 7-6a). The Plan includes several measures defined below to minimize mosquito-borne diseases (italicized text in parentheses has been added to indicate any necessary modifications to the original measures to better meet the Plan's objectives):

- A. KWBA will notify staff of the Mosquito Vector Districts of planned use of recharge basins.
- B. KWBA will implement a water edge road construction pilot program to determine whether KWBA can successfully give Mosquito Vector District spray vehicles access to the recharge basins. If the pilot program is successful, KWBA will build further water edge roads as mutually agreed between KWBA and the Mosquito Vector District staff. If the program is unsuccessful, KWBA and Mosquito Vector District staff will develop an alternative program. *(The water edge road construction program would have had significant impacts on wildlife, particularly breeding water birds. In lieu of this measure, KWBA has and will mow brush as needed and where consistent with KWB HCP/NCCP minimization measures to provide access to Vector Control District staff. KWBA has and will also focus grazing, burning, and mowing, as allowed in the KWB HCP/NCCP Vegetation Management Plan, in dry pond bottoms to eliminate excess vegetation to help*

¹⁵ Kern Water Bank Authority. *Kern Water Bank Master Plan & Economic Analysis*. April 1988.

¹⁶ Kern Water Bank Authority. Response to May 7, 2015 Information request.

minimize breeding areas for mosquitoes when the ponds are refilled [see F. below].

- C. Ponding in certain sections will be phased out. In these sections, KWBA will cycle the spreading process to keep water moving. (Temporary or informal ponding has been eliminated and all recharge now occurs in permanent constructed ponds.)
- D. KWBA will develop a mosquito fish breeding program in conjunction with Mosquito Vector District staff. (Design of a special pond for a mosquito fish breeding program was determined to be infeasible. KWBA has alternatively from time to time purchased mosquito fish from outside vendors as necessary and when available for stocking in recharge ponds and will continue to do so.)
- E. Roads on the KWB will be kept in a reasonable condition to allow the districts access to the KWB.
- F. KWBA will include district staff in adaptive management planning to review the success of mosquito control techniques and to develop improved mosquito control techniques.

The approach for mosquito abatement on KWB Lands is driven by recharge and recovery operations. During periods of recovery when no water is present in the recharge ponds, abatement activity is focused primarily on vegetation management (i.e., removal of roadside ditch vegetation, and cattle and sheep grazing) to diminish suitable mosquito habitat. During periods of recharge when water is present in the ponds, active management strategies are implemented in coordination with VCD personnel to reduce mosquito populations and prevent breeding. Recharge activities occurred intermittently from 1995 to 2007 and then in 2010 and 2011. Between 2005 and 2011, adaptive management strategies involved spraying recharge ponds by truck/helicopter; using mosquito fish in the ponds; and managing vegetation, including the development of a pilot program to reduce potential breeding habitat, including high-density cattails, tules, and aquatic vegetation.

ii. KWB HCP/NCCP Waterbird Management Plan

The KWB HCP/NCCP Waterbird Management Plan is an adaptive management plan that suggests strategies to provide for waterbird habitat, nesting, and hunting opportunities during recharge periods where there is operational flexibility on KWB Lands (Appendix 7-7d). The management plan consists of four key components: monitoring and assessing the population trends of on-site waterbirds, enhancing waterbird habitat, minimizing impacts on waterbirds from KWB operations and maintenance, and providing hunting programs compatible with KWB operations. The management strategy also includes annual breeding bird surveys to proactively minimize operations and maintenance impacts near these sites. A hunting program is operated in collaboration with CDFW and USFWS and includes both public and private hunting opportunities.

By flooding ponds during recharge activities, temporary wetland systems of varying depths are created that provide suitable habitat for a wide range of waterbirds, including waterfowl (e.g., geese and ducks) and shorebird species (e.g., rails, coots, and sandpipers).

The KWB HCP/NCCP Waterbird Management Plan includes the following measures: identify preferential nesting habitat, limit herbicide and pesticide use as feasible (or postpone until after the nesting season), limit new construction during nesting season as feasible, and maintain adequate water levels during the nesting season.

Waterbirds that use KWB Lands may be susceptible to various avian bird diseases. The most common diseases that waterbirds are likely to contract on KWB Lands include salmonella, avian cholera, and botulism. The KWB HCP/NCCP Waterbird Management Plan includes the following measures to reduce the risk of exposure of waterbirds to disease: provide CDFW with access to recharge evaluation for habitat evaluation; monitor the recharge basins for sick and/or dead birds; discourage buildup of dead and rotting vegetation; and plan management activities on adjacent waterbird habitats to beneficially affect waterbirds.

b. Pump Stations and Water Wells

During times of recharge or recovery, field personnel travel to each water control structure or well to record flow and other information. During the pumping season, each well site is checked by a system operator on a regular basis to check flow and electrical meter readings; conduct operation and maintenance checks on the well motor, pumps, and electrical systems; and periodically collect groundwater quality samples. Water well pumps require periodic operational tests during non-pumping years to ensure operational ability. Weed control using herbicides or mechanical methods around existing pump stations, utilities, and control structures is necessary for fire protection and inspection purposes. Identified water-well maintenance procedures in the event of a well malfunction include the procedures outlined in Table 9B.

c. Roads, Berms, and Fencing

Ongoing maintenance activities for roads, berms, and fences can include: clearing vegetation; grading roads, berms, canal side slopes, and canal bottoms; mowing vegetation in canals; repairing and replacing weak sections of berms; controlling erosion and completing repairs; and repairing and replacing fences. Needed maintenance is identified through routine facility inspections by KWBA staff.

There are more than 75 miles of roadways on KWB Lands that provide access to berms and canals for operational inspection and management. Road maintenance activities include annual gravel placement and mowing, and biannual road grading and vegetation management to increase cover on roadways to minimize costs for grading and erosion. Some roadway improvements and widening have also occurred.

Table 9B

Typical Pump Stations and Water-Well Maintenance

Item	Equipment	Nature of Work	Frequency
Motor repair or replacement	Maintenance truck and crane	Remove motor and transport to shop	Every three to five pumping seasons
Pump repair	Pump service rig, crane, and maintenance truck	Remove pump and column pipe from well, then service and reinstall them	Every three to five pumping seasons
Miscellaneous site work	Motor grader, water truck, backhoe, pickup truck	Remove vegetation and conduct well pad inspections	Annually
Electrical repair	Maintenance truck	Clean electrical panels and switch gear and replace components	Quarterly during pumping season

Source: KWBA, 1998 – Kern Water Bank, Master Plan and Economic Analysis

Specific vegetation removal from roadways, turnouts, interpond structures, road crossings, and water conveyance control structures is achieved by burning, motor grading, mowing, and herbicides/manual weed removal. Canal maintenance has also included installing riprap on berms to minimize the rate of erosion. Mowing typically occurs in the late spring during dry hot weather after soil moisture has decreased and before vegetation enters seed production.

Minor pond berm repairs are occasionally required during periods of recharge. These repairs entail rebuilding a short portion of the berm with a backhoe. Maintenance of unregulated berm slopes, canal side banks, and roadways has required an adaptive management approach to curtail various nuisances. Pests like ground squirrels, rodents, and wild pigs are known to tunnel into berms and roadways, causing minor water seepage. Other measures include controlled use of rodenticides in accordance with the KWB HCP/NCCP and applicable regulations.

2. Land Maintenance

The primary tool for managing the habitat and fauna of the Kern Water Bank is the HCP/NCCP's Vegetation Management Plan, with the primary goal being the minimization of tumbleweed and other noxious non-native plant growth (primarily salt cedar). This in turn encourages native plant growth and the continued conversion of water bank lands into exceptional upland, riparian, and alkali flat habitats. The tools provided in the Vegetation Management Plan include burning, grazing, disking, mowing, and herbicide application.

From 1996 through 1999, tumbleweeds were primarily controlled with burning. In 2003, tumbleweeds were primarily controlled with cattle and sheep grazing programs. Other management programs include burning in ditches and chopping old tumbleweed drifts. Chopping removes the dense cover of the drifts and allows for the reestablishment of grasses and

forbs which compete with the tumbleweeds. Tumbleweeds may be burned under a permit from the San Joaquin Valley Air Pollution Control District that is renewed annually. Active burning also occurred on the property from 1999 to 2003 and from 2008 to 2013.

Salt cedar is controlled with herbicide spraying at various locations on an as-needed basis in accordance with best management practices and State and county regulations. Hand sprayers are used around wells and gate structures. Aerial spraying of herbicides onto stands of cattails in recharge ponds was conducted on a limited basis in 2006 and 2011, as they can encourage mosquito populations. Between 2011 and 2013, yellow star-thistle proliferation required manual hand removal and subsequent burning.

Sheep and cattle grazing has occurred throughout the property, depending on yearly need and management direction, between 1997 and 2013. Vegetation along roads, berms, and canals is typically mowed once a year after nesting seasons.

3. Habitat Restoration and Enhancement

The creation of the KWB ~~has~~ resulted in the reestablishment and preservation of ~~exceptional~~ wetland and upland habitat that existed historically throughout much of the southwestern San Joaquin Valley. About 17,000 of the approximately 20,000 acres that comprised the KFE property were farmed intensively prior to 1991. Now, the water conservation activities of the KWB are ~~re-creating intermittent wetland habitat such as~~ habitat along the recharge ponds, where marsh-like environments are established during recharge periods and create ideal habitat for waterfowl, shorebirds, raptors, and other native and migrating birds and encouraging native grasses and plants that help to promote the threatened and endangered species associated with this area.

Willows, cottonwoods, sedges, and other wetland vegetation are reemerging, and the recharge basins and basin edges are providing nesting and foraging habitat for waterfowl and other birds. Through 2014, To date, more than 66 40 species of waterfowl have been sighted on KWB Lands KFE property, including Caspian terns, the white-faced ibis, double-crested cormorants, Barrow's goldeneye, purple martin, and white pelicans.^{iv(d)}

Recharge activities only occur on about one third of KWB Lands KFE property; upland habitat is becoming reestablished on the remaining two thirds of the property. Vegetation management in these areas is focusing on regenerating native grasses and plants that help to promote the threatened and endangered species associated with this area. This upland habitat is supporting large populations of raptors, kangaroo rats, rabbits, badgers, bobcats, and coyotes. Of particular importance are the populations of Tipton kangaroo rats, burrowing owls, and tri-colored blackbirds. On occasion, San Joaquin kit fox has been observed on KWB Lands. Studies have suggested that the abundance of coyotes, a predator of the kit fox, may be suppressing kit fox populations.^{iv(e)}

While not directly improving any particular habitat, KWBA has installed several wildlife water stations (or guzzlers) for small animals and birds throughout KWB Lands that provide a source of water during years of lean rainfall or limited recharge activity. Several electrical-service pole distribution transformers have been refitted with more bird-friendly transformer boxes to

accommodate nesting birds. Other activities carried out on KWB Lands that have provided habitat enhancement include trash cleanup and toxic material cleanup. These maintenance activities have occurred on an as-needed basis determined annually.

4. Clean-up of Areas of Environmental Concern

The following paragraphs describe areas of environmental concern discussed up to 2007. An update to impacts related to hazardous materials and sites is found in Sections 7.2, Water Quality, and 7.11, Hazards and Hazardous Materials.

A *Preliminary Environmental Assessment* report prepared by Luft Environmental Consultants in October 1995 identified “Areas of Potential Environmental Concern” (APECs) on the KFE property. All of the APECs which are KWBA’s responsibility have been cleaned up, remediated and/or closed. These include:

- *Buena Vista Ranch Headquarters and the HSST Ranch Headquarters:* The pesticides in soil identified at the Buena Vista Ranch Headquarters and the HSST Ranch Headquarters, each an APEC, were remediated by the Kern Water Bank Authority. The scope of the clean-up involved excavating contaminated soil and treating it in a thermal-desorption unit. The Department of Toxic Substances Control certified that the remedial activities were complete in 2001 and that the land could be used for all uses, including the “intended purpose of maintaining a groundwater resource bank.”
- *S&M Farms, Tumbleweed Farms, Red Dirt, Two Tanks:* No significant environmental issues were identified at these sites. The trash at S&M farms and the two tanks have been removed.
- *Underground Storage Tanks:* The Kern Water Bank Authority has also removed two underground storage tanks (USTs) not identified in previous environmental reports. The USTs were uncovered at the Buena Vista Ranch Headquarters on April 30, 1999, and removed May 7, 1999 under a Kern County Environmental Health Services Department permit. No soil contamination was detected beneath the USTs, and the county has indicated the tank closure is complete with no further action necessary.

The balance of the APECs identified in the Luft Report are not the responsibility of KWBA. However, KWBA is tracking these issues and coordinating with the appropriate regulatory agency where appropriate. For example, KWBA has been discussing potential impacts at the former Uhler Fire Training Facility with both Kern County and the Regional Water Quality Control Board. (All of the facilities at this site have been removed, and Kern County is in the process of developing a bid to have soil and groundwater at the site assessed.) KWBA is also actively tracking assessment and clean-up activities associated with the former Wait-Midway Pipeline and the Strand Oil Field.

D. HCP/NCCP Mitigation and Monitoring

The HCP/NCCP requires the KWBA to be responsible for establishing, maintaining, and enhancing habitat preserves, carrying out site-specific mitigation measures and for monitoring and reporting the results of management activities to the USFWS and CDFG in Annual Reports. KWBA compiles the annual report with input from professional biologists and botanists.

1. Monitoring Compliance

Annual biological monitoring is performed on KWB Lands in accordance with the Minimization of Impacts Requirements (see Attachment H in Appendix 7-7a) and other measures prescribed by the KWB HCP/NCCP Vegetation Management Plan (see Appendix 7-7c). The purpose of the surveys is to assist in determining the success of the KWB Vegetation Management Plan, including the reestablishment of habitat along the recharge ponds, where marsh-like environments are established along the Pacific Flyway and upland habitats that support various special-status species. Annual survey results assist with determining the need for adaptive management. Rare-plant surveys are performed at least every other year. Annual surveys are conducted for San Joaquin kit fox and Tipton kangaroo rat. Surveys also include assessment of potential sensitive-species predators and the presence of nesting and foraging habitat for waterfowl.

Monitoring is undertaken by KWBA in compliance with the KWB HCP/NCCP. Annual reports are issued summarizing land use by wildlife, any environmental take related to activities on KWB Lands, and habitat and vegetation restoration efforts.

As described previously, willows, cottonwoods, sedges, and other intermittent wetland vegetation have reemerged along the edges of the recharge basins and earthen canals on KWB Lands that have been found to provide nesting, breeding, and foraging habitat for waterfowl, shorebirds, raptors, and other native and migrating birds. A noticeable increase in the habitat value for upland species found on the property has also been identified.

From 1999 through ~~2005~~2014, with the assistance of wildlife biologists and the cooperation of the USFWS and CDFG, KWBA staff ~~have~~ spent many hours in the field observing, photographing, trapping, and enumerating wildlife to document any instances of “take”, either through construction activities or KWB operations. These monitoring activities are, in part, prescribed in the HCP. For example, populations of the San Joaquin Kit fox are surveyed with a nighttime spotlighting program, and Tipton Kangaroo rat populations are surveyed with trapping grids. Other surveys are conducted voluntarily (e.g., waterfowl and tumbleweeds). The only instance of “take” ever reported was the temporary relocation of live Tipton kangaroo rats during the construction of the Kern Water Bank Canal headworks. The kangaroo rats were successfully reintroduced to the area after construction was completed.

2. Mitigation Measures

The HCP prescribes various mitigation measures for construction and repair activities (see Section V.A.2.b.). According to the KWB's annual reports, these measures were adhered to as required.

VII. Alternatives for Recharge at KWB

[This section is not repeated here since it was part of the water supply management practices analysis pursuant to Article 56 of the Monterey Amendment, as presented in DEIR Appendix E and in FEIR Chapter 15. Furthermore, the Court ordered the Department to evaluate the transfer, development, and continued use and operation of the KWB rather than evaluate project alternatives, which was already conducted in the DEIR; the Court found the Monterey Plus EIR alternatives to be adequate.](#)

VIII. Effects of KWB Development and Operations

[This section is not repeated here because REIR Chapter 7 replaces Section VIII in its entirety.](#)

IX. Summary

[This section is not repeated here because REIR Chapter 7 replaces Section IX in its entirety.](#)

References

- i California Department of Water Resources, Bulletin 132-93:11-12, 1995.
- ii Draft DWR memo dated October 6, 1993.
- iii California Department of Water Resources, Bulletin 132-94;26, 1996.
- iii(a) [Department of Water Resources, Draft Environmental Impact Report, Monterey Amendment to the State Water Project Contracts \(Including Kern Water Bank Transfer\) and Associated Actions as Part of a Settlement Agreement \(Monterey Plus\) Volume II.](#)
- iv KWBA, Initial Study and Addendum to Monterey Amendment EIR of the KWBA Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, June 1997.
- iv(a) [State of California Water Resources Control Board. 2014 \(March\). Order Approving a Change in the Place of Use of License and Permits of the California Department of Water Resources and United States Bureau of Reclamations in Response to Drought Conditions. Sacramento, CA.](#)
- iv(b) [Kern Water Bank Authority. 2015 \(May\). Response to Request for Information dated May 22, 2015. Received on May 28, 2015.](#)
- iv(c) [Kern Water Bank Authority. 2014 \(May\). Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan. Bakersfield, CA.](#)
- iv(d) [Kern Water Bank Authority. 2014 \(May\). Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan. Bakersfield, CA.](#)
- iv(e) [Kern Water Bank Authority. 2014 \(May\). Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan, 2013 Compliance Report and 2014 Management Plan. Bakersfield, CA.](#)
- iv(f) [Kern Water Bank Authority and West Kern Water District. 2013. Agreement between West Kern Water District and Kern Water Bank Authority for the Exchange and Recharge of Water. Bakersfield, CA.](#)