



CAMBRIA COMMUNITY SERVICES DISTRICT

MEETING	TIME & DATE	LOCATION
Resources & Infrastructure Committee	2:00 PM Monday, February 12, 2024	Cambria Veterans' Memorial Hall 1000 Main Street, Cambria, CA 93428

AGENDA

Regular Resources & Infrastructure Committee Meeting

Monday, February 12, 2024 2:00 PM

In person at:

**Cambria Veterans' Memorial Hall
1000 Main Street, Cambria, CA 93428**

AND via Zoom at:

Please click the link to join the webinar: [HERE](#) Passcode: 090720

Copies of the staff reports or other documentation relating to each item of business referred to on the agenda are on file in the CCSD Administration Office, available for public inspection during District business hours. The agenda and agenda packets are also available on the CCSD website at <https://www.cambriacsd.org/>. In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting or if you need the agenda or other documents in the agenda packet provided in an alternative format, contact the Confidential Administrative Assistant at 805-927-6223 at least 48 hours before the meeting to ensure that reasonable arrangements can be made. The Confidential Administrative Assistant will answer any questions regarding the agenda.

1. OPENING

- 1.A Call to Order**
- 1.B Establishment of Quorum**
- 1.C Chair Report**
- 1.D Ad Hoc Subcommittee Report(s)**
- 1.E Committee Member Communications**
- 1.F Utilities Department Manager Report**

2. PUBLIC COMMENT

Members of the public may now address the Committee on any item of interest within the jurisdiction of the Committee but not on its agenda today. Future agenda items can be suggested at this time. In compliance with the Brown Act, the Committee cannot discuss or act on items not on the agenda. Each speaker has up to three minutes.

3. CONSENT AGENDA

- 3.A Consideration to Approve the December 11, 2023 Regular Meeting Minutes**

4. REGULAR BUSINESS

4.A Discussion Regarding Board-Approved Agreement for Consultant Services with MKN & Associates, Inc., for Engineering Design and Bid/Construction Phase Services for the Replacement of the Stuart Street Tanks, Review Proposals, and Site Visit Updates

4.B Discussion and Consideration of a Recommendation to the CCSD Board of Directors Regarding Approval of an Agreement for Contractor Services for Replacing San Simeon Well 3 Pump

4.C Discussion and Consideration of the Alignment Alternatives for the San Simeon Well Field Transmission Line and Secondary Effluent Line Replacement Project

4.D Discussion Regarding Supplemental Water Supply Options Memorandum

5. FUTURE AGENDA ITEM(S)

6. ADJOURN

RESOURCES & INFRASTRUCTURE COMMITTEE

REGULAR MEETING

Monday, December 11, 2023 - 2:00 PM
1000 Main Street Cambria, CA 93428

MINUTES

1. OPENING

A. CALL TO ORDER

Chairperson Dean called the meeting to order at 2:00 pm

B. ESTABLISH QUORUM

A quorum was established.

Committee members present: Karen Dean, Juli Amodei, James Webb, Steve Siebuhr, Mark Meeks, and Derrick Williams.

Staff present: General Manager Matthew, McElhenie (remotely), Confidential Administrative Assistant Haley Dodson (remotely), Program Manager Tristan Reaper, Wastewater Superintendent Toni Artho, and Water Systems Superintendent Cody Meeks.

C. CHAIRMAN'S REPORT

Chairperson Dean reported that Board Member Tom Gray was elected District Board President. Chairperson Dean will continue to serve on the Board until December 6, 2024.

The District passed the intent to serve motion for the bathroom on the East Ranch, as well as the amendment to the master park plan and a deed restriction needed to proceed with the East Ranch bathroom.

D. AD HOC SUBCOMMITTEE REPORTS

Capital Improvement Project Prioritization. Committee member Williams reported that the Capital Improvement Prioritization Ad Hoc committee met on November 27 with Utilities Department Manager Jim Green and a number of the program managers and superintendents. The next committee meeting is on January 3.

Infrastructure Grant Options. Chairperson Dean started reviewing the grant webinar, and will report out on it to the other committee members.

E. COMMITTEE MEMBER COMMUNICATIONS

Committee member Amodei announced that the \$600,000 State grant appears to be approved for the Skate Park. This grant would be the final funding needed for the project. Hopefully the project will go out for construction bid in the latter part of 2024.

Committee member Williams attended the recent Association of California Water Agencies conference.

F. UTILITIES DEPARTMENT MANAGER

Wastewater Superintendent Toni Artho reported that his department is installing a new Coleman Gear Drive on clarifier #2, but found additional problems as the old drive was being disassembled. More new parts are needed. The quote for the new parts is over \$30,000.

The RWQCB will replace the District's specific waste discharge permit with a general waste discharge permit in April. Mr. Artho is reviewing differences between our current waste discharge permit and the general permit.

The SST program is currently adding smaller blowers to replace the current, larger blowers. The District is analyzing how to use the existing blowers for backups for the new one. The District may buy a smaller blower that can be used as a backup; this will appear in the next CIP.

Water Systems Superintendent Cody Meeks reported on a water leak on Wall Street. This pipe has leaked regularly, and the water department decided to replace a longer stretch of that line rather than repair the specific leak. This was done in house with District Staff.

Water Systems Superintendent Cody Meeks reported that a contractor recently replaced 35 feet of water line on private property off Manor Way.

Water Systems Superintendent Cody Meeks is working on lid inventory for the new AMI meters. The District will likely not need to buy all new lids for the meters, but will be able to refurbish existing lids.

Committee member Amodei asked about the bathroom repairs on Center Street. The problem appeared to be a clogged line, but the bathroom is now reopened.

2. PUBLIC COMMENT

Chairperson Dean reported on two written comments:

- One from Elizabeth Simonds
- One from Lum Bryant

The subjects of the comments are not under the jurisdiction of R&I committee, and will be read at the PROS committee.

3. CONSENT AGENDA

A. Consideration to Approve the November 6, 2023 Special Meeting Minutes

Committee Member Webb moved to approve the minutes.

Committee Member Amodei seconded the motion.

The motion was approved: 5-Ayes; 0-Nays; 0-Abstain; 0-Absent

Mr. Crosby Swartz noted on page 7 of the minutes that the sponsor of the Zero Liquid Discharge pilot project is Global Water Innovations, not Groundwater Innovations.

Committee Member Williams moved to approve the revised minutes.

Committee Member Amodei seconded the motion.

The motion was approved: 5-Ayes; 0-Nays; 0-Abstain; 0-Absent

4. REGULAR BUSINESS

A. Discussion and Consideration of 2024 Resources & Infrastructure Committee Meeting Dates

Chairperson Dean proposed that Committee meetings remain on the second Monday of each month. Chairperson Dean reviews each meeting date. The October and November meetings will be on the first Monday of the month to avoid holidays. Committee Vice Chair Siebuhr will chair the December meeting.

Committee Member Amodei moved to approve the 2024 meeting dates.

Committee Member Williams seconded the motion.

The motion was approved: 5-Ayes; 0-Nays; 0-Abstain; 0-Absent

B. Discussion and Consideration to Update the Resources & Infrastructure Standing Committee Ad Hoc Committees

Chairperson Dean suggests reactivating the Climate Policy Committee. The committee will work with the District's new grant writer to look for funds for writing a Climate Action Plan. The climate policy committee will remain separate from the Infrastructure Grant Committee. Committee member Amodei asks General Manager McElhenie about a schedule for resubmitting the Climate Action Plan grant. General Manager McElhenie is trying to do as much grant writing internally as possible. He will start working on the grant with District staff.

The Brine Waste Disposal Options Committee report was presented to the Board of Directors on December 7. The Board decided to change the name of the report to the WRF Concentrate Disposal report. The committee may need to meet again after the Zero Liquid Discharge pilot program is complete.

The Long-Term Water Supply and Storage Option Committee report was submitted to the Board of Directors on November 9. That project is done.

Two new committees were formed on November 6: the Infrastructure Grant Options Committee and the Capital Improvement Project Prioritization Committee. Both committees will remain ongoing

Recently the District learned of supplemental water supply possibilities. One is using a drone to look for water bearing sediments. The second is working with ranchers

with riparian rights on Santa Rosa Creek. The third idea is solar hydro panels that condense water from the air. Chairperson Dean proposes a Supplemental Water Supply Committee to look into these three options. The committee consists of Mr. Webb, Mr. Meeks, and Mr. Williams

Chairperson Dean asks if an asset management/asset inventory committee is necessary. This committee is put on hold until after the CIP/budget cycle.

Committee Member Amodei moved to adopt the new ad-hoc committee structure.

Committee Member Webb seconded the motion.

The motion was approved: 5-Ayes; 0-Nays; 0-Abstain; 0-Absent

C. Receive Update on Advanced Clean Fleet Regulation

Mr. Reaper presents a presentation on the clean fleet regulation.

Mr. Reaper says there are penalties for non-compliance, but California Air Resources Board has not said what the penalties are.

4. FUTURE AGENDA ITEMS

Chairperson Dean asked for any future agenda items.

The Capital Improvement Project Prioritization Ad-Hoc Committee will present an update at the next R&I Committee meeting.

The Committee should review bylaws once per year. The Committee will do this in the January meeting.

5. ADJOURN

Chairperson Dean adjourned the meeting at 2:52 pm.

CAMBRIA COMMUNITY SERVICES DISTRICT

TO: Resources and Infrastructure Committee

AGENDA NO. 4.A.

FROM: James Green, Utilities Department Manager
Cody Meeks, Water Systems Superintendent

Meeting Date: February 12, 2024

Subject: Discussion Regarding Board-Approved Agreement for Consultant Services with MKN & Associates, Inc., for Engineering Design and Bid/Construction Phase Services for the Replacement of the Stuart Street Tanks, Review Proposals, and Site Visit Updates

RECOMMENDATIONS:

It is recommended that the R&I Committee discuss the board-approved agreement for consultant services with MKN & Associates, Inc., review proposals, and receive an update on the site visit and kick-off meeting.

FISCAL IMPACT:

The estimated cost of \$187,667 is based on the proposal MKN & Associates (MKN) provided. An encumbered budget of \$458,000 has been allocated to this tank replacement project. An additional \$375,000 of federal funding has been secured from the USEPA Community Project Funding Grants Program for a total project budget of \$833,000. This agenda item is for the design and project management cost and does not include materials and tank construction costs.

DISCUSSION:

The Board of Directors approved a contract with MKN & Associates Inc. (MKN) on December 14th, 2023, for engineering design and construction project management services to replace the Stuart St (Stuart St Tanks) drinking water tanks with similar-sized tanks. Additional proposals were sought. The additional proposal received is attached.

Project Update

The contract language referencing “bolted” throughout the sub-contractor proposals has been updated to include a “no-cost scope amendment stating the foundation and welded steel installation changes. The change-order is attached.

Staff is scheduled to meet with MKN and some of their sub-consultants at the Stuart St site on Feb 6th for a site visit/inspection. Topics of discussion for the meeting include geotechnical and structural surveys, additional evaluation of underground plumbing to the tanks, upgrading infrastructure to Booster Station, seismic expansion joints, couplings, hydrostatic mixing manifold in the interior of the tank, and appurtenances to be installed on top of tank surface (i.e... Antennae and communication devices).

Initial discussion has taken place concerning the replacement operational process. Staff and consultants agree that a “one tank at a time” approach would be the most beneficial and least vulnerable path for replacement.

Timeline for Engineering Plans

Our consultants have proposed an aggressive timeline for deliverables as follows.

- 30% Engineering at week 16 (four months)
- 90% Engineering an additional eight weeks (two months) to design from 30% - 90%.
- 100% Design Engineering Plans an additional four weeks (one month) for completed drawings.

The engineering process will take seven to eight months to complete, with bids for installation being sought in the final month of plan rendering.

Also for consideration is the color of the tanks. Attached are the color options for the coating applied to the tank.

Staff will provide additional updates as this project progresses.

Attachments: Cannon Proposal Stuart Street Tanks Replacement
Cannon Proposal Stuart Street Tank Fees Nov 2023
Stuart Street Tanks Change Order SA1
Protective Marine System 4000 Color Card
Stuart Street Kickoff Meeting



November 17, 2023

Mr. Tristan Reaper
Program Manager – Utilities and Engineering
Cambria Community Services District
1316 Tamsen Street, Suite 201
Cambria, CA 93428

PROJECT: STUART STREET TANKS REPLACEMENT

Dear Tristan:

The Cambria Community Services District's (District) Stuart Street Tank Facility provides essential water storage for your distribution system. Due to the age and condition of the existing storage tanks on the site, replacement is necessary. Leaks have formed, and the tank structure is beyond rehabilitation. Two new bolted steel tanks will need to be constructed in their place. The existing ringwall structures will need to be evaluated to determine if they can support the new tanks by current code.

Additional freeboard is also needed to bring the tanks into seismic compliance. The tank replacement project will also need to comply with CEQA and NEPA requirements due to grant funding secured for the project. The various needs of this project requires a team of professionals well versed in this type of permitting, design, and construction.

Replacement of the Stuart Street Tanks will provide two new storage tanks that eliminate maintenance and repairs due to leaks, and protect the District's water supply. The new tanks will be installed in compliance with new codes, which will increase seismic stability and ensure longevity to the facilities. Environmental compliance with the regulating agencies will also ensure grant funding can be secured for the project.

Canon will approach this project by verifying the environmental needs of the project, obtaining permit approvals (or exemptions), performing geotechnical investigations, and preparing the design for two new bolted steel tanks. Our structural team will evaluate the existing concrete ringwall foundations to determine if they will support the new tanks, and we will design the new tanks to meet current codes.

We understand the District is seeking assistance from a highly qualified consultant team experienced in designing storage tanks, working in or around environmentally sensitive areas, coordinating with utility companies and property owners, and providing overall project management to see the project through to completion. We



have assembled an experienced team with extensive knowledge of tank codes and standards, which has completed projects identical in scope to this one and that will make this project a success. Our team is ready to jump right in and provide permanent solutions to protect these assets for many years to come.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael J. Kielborn'.

Michael J. Kielborn, PE, LEED AP
Principal Engineer
C 70112

PROJECT UNDERSTANDING AND APPROACH

Two bolted steel storage tanks at the Stuart Street Tank site are in need of replacement. The tanks were constructed in 1992, and have reached the end of their usable service life. The tanks are leaking and creating maintenance and safety issues for the District. Replacement of these tanks with two new tanks is desired. Tank No. 1 has a storage capacity of 212,000 gallons and a diameter of 40 feet. Tank No. 2 has a storage capacity of 125,000 gallons and a diameter of 30 feet. Both tanks are 24 feet tall and provide 1 foot of freeboard, with the overflow at 23 feet. Based on current codes, 1 foot of freeboard will not meet current AWWA requirements for seismic activity, and the new tanks will require an increased height of 3 to 4 feet to maintain the existing storage capacity.

The project site is on a flat lot in a residential area of Lodge Hill between Stuart Street and Richard Avenue about 500 feet south of the intersection of Richard Avenue and Ardath Way in the southwest region of Cambria. Elevations at the site range from approximately 438 to 450 feet. The existing tanks and facility are approximately 8 feet higher in elevation than Richard Avenue and 8 feet lower in elevation than Stuart Avenue. A concrete masonry block retaining wall with an estimated height of 6 feet surrounds the property boundary on the north, east, and south sides. Access is from Richard Avenue up a relatively steep asphalt concrete driveway. A pump pad and generator pad are also present at the site. The site is bordered to the north and south by residential properties and vacant lots.

The proposed project will include replacing the existing bolted steel tanks with new bolted steel tanks. The design capacities of the tank will remain the same. Other improvements include new roadway surfaces and piping associated with connecting the new tank to the existing distribution system. Depending on the condition of the existing tank foundations, it may be possible to reuse the existing foundation(s) with the new tanks. Our structural team will determine whether this is feasible or if new foundation(s) are required. To minimize impacts to operational and emergency storage during construction, each tank will be demolished and replaced sequentially during the off-season, when consumption is historically lower and the risk of fire is reduced.





SCOPE OF WORK

This scope of work was developed based on our discussions with you, as well as our experience with projects of this nature.

Phase I – Preliminary Engineering Services

Task 1 – Project Kick-off

Task 1.1 Kick-off Meeting

Cannon will orchestrate and attend a Project Kick-Off meeting with District staff. The meeting agenda will focus on project understanding, team involvement, and project constraints. This meeting will also include a project introduction, review of background information and project scope, discussion of the District's preferences, and an overview of the project schedule. This meeting represents a key opportunity for representatives from the District to steer the Project Team and further clarify critical elements of the project scope.

Task 1.2 Project Management and Meetings

The project will require project setup, scheduling, controlling, and correspondence between Cannon, the District, subconsultants, and regulatory agencies. Correspondence includes telephone conversations, emails, project meetings and status reports, and project memorandums. Additionally, project management will include monthly work summaries and detailed invoices.

Task 2 – Project Research and Investigation

Task 2.1 Site Reconnaissance / Field Visit

This task will include the following:

- Collect relevant site information with Project Team and District staff
- Review project site constraints
- Observe surface features
- Meet with all required Regulatory Agencies.
-

Task 2.2 Utility Search

We will conduct a USA Dig Alert search, contact utility agencies, and request record drawing information from each utility agency. Summarize contact persons and utility requirements. All obtained utilities drawings will be used to populate the base drawings established by the topographic survey.



Task 2.3 Document Review and Research

Cannon will review and collect all pertinent data as it relates to the proposed project. This includes the following:

- Review of existing record drawings
- Review any previous studies or reports
- Gather operational data from District Operations and Maintenance Staff

Task 3 – Topographical Survey

In our effort to provide an accurate and detailed design, we will provide a topographic survey of the site. We will confirm elevations and accurately locate above ground structures. The topographic and right-of-way survey will include the following information:

- Horizontal locations based on the California State Plane Coordinate System, Zone 5.
- Elevations based on NAVD88 Vertical datum.
- Existing corridor features, including edges of pavement, fences, utility poles, driveways, and drainage swales.
- Nearby above ground structures, above ground cable and electrical boxes.
- Existing surface improvements including fire hydrants located within or adjacent to the project; water system appurtenances, sanitary sewers and storm drain manholes, catch basins and inlets, showing surface, inlet and invert elevations.
- Locations of trees that are 4 inches in diameter or greater within or adjacent to the project work areas.

Task 4 – Geotechnical Investigation

Geotechnical investigations will be performed by our subconsultant, Yeh and Associates. Their scope of work is outlined below.

- Task 4.1 Project Initiation
- Task 4.2 Pre-Field Planning
- Task 4.3 Drilling and Laboratory Testing
- Task 4.4 Draft Geotechnical Report
- Task 4.5 Final Geotechnical Report



Task 5 – Environmental Documents

Environmental investigations will be performed by our subconsultant, SWCA. Their scope of work is outlined below. It is assumed that a Categorical Exemption will be appropriate for this project, as it is a facility replacement, in kind. If additional permitting is required, the additional scope will be outlined and submitted to the District for approval prior to completing that task.

- [Task 5.1 Project Management](#)
- [Task 5.2 Project Description](#)
- [Task 5.3 Biological No Effect Memo](#)
- [Task 5.4 Cultural Resources Survey Report](#)
- [Task 5.5 NEPA Compliance](#)
- [Task 5.6 CEQA Exemption](#)
- [Task 5.7 Coastal Commission Exemption](#)

PHASE 2 – Design Services

Task 6 – 30% Plans

Based on the findings and results of the previous tasks, we will prepare and submit a design plan package at the 30% approximate completion level for the tank replacements. The design plan package will include title sheet, notes, plan sheets, and detail sheets. The plans will be submitted to the District for review and initial comment on the layout and tank features desired. We will attend a meeting with the District to review and discuss the 30% design submittal. This will allow the District to comment on the proposed design and any construction methods, materials and maintenance issues.

Task 7 – 90% Plans, Specifications, and Cost Estimates

Based on the comments and findings from the 30% submittal, we will prepare and submit a design plan package at the 90% approximate completion level with the appropriate revisions to the plans. The design plan package will include updated title sheet, notes, plan sheets, and detail sheets. This submittal will also include the technical specifications and cost estimate. Technical Specifications and Special Conditions will be prepared using and referencing the District's standard boilerplate specifications and the latest edition of the Greenbook and the technical specifications from similar projects based on Cannon's experience.



We will attend a meeting with the District to review and discuss the 90% design submittal. This will allow the District to make any final comments or changes to the plans and specifications prior to final submittal and completion.

Task 8 – Final Plans, Specifications, and Cost Estimates

Based on the finalized project design issues resolved during the preceding tasks, we will prepare and submit a Final Construction Documents package for the project. This submittal package will contain complete construction plans, technical specifications, known permit conditions, and an Opinion of Probable Construction Costs. Final plans will incorporate comments from the District’s review of the 90% Design Plan package. These documents will be prepared in the District’s standard format and incorporated into the final bid package.

Task 9 – Bid Package Preparation

The final bid package will be prepared and incorporate the completed Final Plans, Technical Specifications and Special Conditions, a Bid Schedule, and the District provided “front-end” General Provisions. The Bid Package will incorporate all the required documents for the project to be advertised and sent out to bid.

PHASE 3 – Construction Bidding Services

We will provide the District with engineering services during the bidding of the tanks. We will provide support to the District and provide the following listed services. The work hours assumed for each task are based on our previous project experience with similar projects. The actual time required may vary based on the requested level of involvement.

Task 10 – Respond to RFI’s

Processing of requests for information (RFIs) and requests for clarification (RFCs) are vital for keeping the bid opening on schedule and to minimize Contractor assumptions could affect the overall cost of the bids. RFIs and RFCs received from the Contractor will be reviewed and responses returned to the District for inclusion with Bid Addenda.

Task 11 – Bid Review

We will assist the District with review of the bids and Contractor qualifications, and assist the District in making a Contractor selection for the project.



PHASE 4 – Construction Support

We will provide the District with engineering services during construction of the tanks. We will provide support to the District and provide the following listed services. The work hours assumed for each task are based on our previous project experience with similar projects. The actual time required may vary based on the requested level of involvement.

Task 12 – Construction Kickoff Meeting

We will attend a pre-construction meeting with the selected contractor, District staff, and other appropriate utility agency representatives. This meeting will provide an opportunity for thorough review of the project plans, compliance requirements, and construction schedule, prior to the start of work.

Task 13 - Additional Site Visit or Meeting

We will perform a field visit and/or attend a virtual meeting with the Contractor and District staff as necessary. This visit can be to review project progress or clarify design intent of the project. The field visit will be documented, listing what we observed and noting any issues that should be addressed by the District.

Task 14 - Submittal Reviews

Each Shop Drawing submittal received from the contractor will be reviewed for its completeness and conformance to the project specifications and District standards by the Design Engineer. Draft shop drawing submittals will be distributed to the District for review and final comments before being returned to the contractor for action. We have assumed review of 12 submittals total, including resubmittals.

Task 15 - RFI Review and Responses

The process of reviewing and responding to RFIs is vital to keeping the project on schedule and resolving issues before they become “claims” or “project delays”. RFIs received from the contractor will be addressed and responded to via email by Cannon’s Design Engineer and will be returned to the contractor in a timely manner. We will review and respond up to six RFIs total for this project.



Task 16 - Record Drawings

At the end of the project, we will prepare record drawings based on redline information provided by the contractor and the field inspection crew. We will include all observed deviations noted during our field visit, as well as any modifications made through the RFI or change order process. The changes will be compiled and noted on the plans to monument the final installed facility.

FEES

Fees are based on the rates per the enclosed fee schedule and do not include Agency checking or recording fees, or title company fees. It is our understanding that this project qualifies for California Prevailing Wages.

<i>Phase 1. Preliminary Engineering</i>	<i>\$ 98,969</i>
<i>Phase 2. Design</i>	<i>\$ 57,444</i>
<i>Phase 3. Construction Bidding</i>	<i>\$ 4,488</i>
<i>Phase 4. Construction Support</i>	<i><u>\$ 26,766</u></i>
T&M Not to Exceed:	\$187,667



2023/2024 Fee Schedule

Bill Rate Ranges
Subject to change

Assistant Resident Engineer	\$ 150 - \$ 197
Associate Engineer	\$ 168 - \$ 230
Associate Land Surveyor	\$ 205 - \$ 223
Associate Landscape Architect	\$ 169 - \$ 204
Automation Specialist	\$ 157 - \$ 200
Automation Technician	\$ 121 - \$ 142
CAD Tech	\$ 101 - \$ 136
CAD Manager	\$ 128 - \$ 159
Construction Inspector I - III	\$ 119 - \$ 191
Design Engineer	\$ 139 - \$ 184
Director/ Department Manager	\$ 200 - \$ 297
Engineer Tech	\$ 110 - \$ 144
Engineering Assistant I - II	\$ 113 - \$ 139
Grant Funding Manager I - II	\$ 151 - \$ 204
I&E Services Coordinator	\$ 108 - \$ 138
Information Systems Admin/Manager	\$ 128 - \$ 159
Land Surveyor	\$ 187 - \$ 225
Landscape Architect	\$ 125 - \$ 156
Landscape Designer I - II	\$ 103 - \$ 142
Lead Automation Specialist	\$ 167 - \$ 209
Lead Automation Technician	\$ 127 - \$ 164
Lead Designer	\$ 133 - \$ 175
Office Engineer / Document Control I-III	\$ 114 - \$ 164
Plan Check Engineer I - II	\$ 131 - \$ 192
Planner I - III	\$ 121 - \$ 168
Planning Assistant	\$ 98 - \$ 138
Principal Automation Specialist	\$ 176 - \$ 219
Principal Designer	\$ 127 - \$ 189
Principal Engineer	\$ 198 - \$ 277

Other Direct Charges

Black Line Plots	\$2.00 per page
Outside Reproduction	Cost + 15%
Mylar Plots	\$12.00 per sheet
Automation & Electrical Materials	Cost + 25% (+tax)
Subconsultant Fees	Cost + 10%
Technology Fee	\$30/Day
Color Plots	\$5.00 per page
Travel and Related Subsistence	Cost + 15%
Standard Mileage Rate	IRS Rate per mile
Airplane Mileage Rate	GSA Rate per mile

Project Designer	\$ 122 - \$ 169
Project Engineer	\$ 151 - \$ 199
Resident Engineer	\$ 191 - \$ 235
Sr. Associate Architect	\$ 209 - \$ 249
Sr. Associate Engineer	\$ 173 - \$ 265
Sr. Automation Specialist	\$ 172 - \$ 213
Sr. Automation Technician	\$ 142 - \$ 180
Sr. CAD Tech	\$ 113 - \$ 145
Sr. Consultant / Principal-in-Charge	\$ 266 - \$ 333
Sr. Land Surveyor	\$ 203 - \$ 263
Sr. Landscape Architect	\$ 183 - \$ 221
Sr. Plan Check Engineer	\$ 172 - \$ 217
Sr. Principal Designer	\$ 139 - \$ 212
Sr. Principal Engineer	\$ 210 - \$ 305
Sr. Project Designer	\$ 122 - \$ 182
Sr. Project Engineer	\$ 157 - \$ 215
Sr. Resident Engineer	\$ 196 - \$ 246
Survey Assistant	\$ 113 - \$ 142
Survey Technician I - V	\$ 139 - \$ 208
Technical Writer I - IV	\$ 113 - \$ 139

Survey Crew Rates - Regular

One-Man Field	\$ 207	\$ 222
Two-Man Field	\$ 289	\$ 304
Three-Man Field	\$ 380	\$ 395
Two-Man - HDS	\$ 332	\$ 347

Survey Crew Rates - Prevailing Wage

One-Man Field	\$ 255	\$ 271
Two-Man Field	\$ 367	\$ 389
Three-Man Field	\$ 523	\$ 539

Electrical - Prevailing Wage

Electrician	\$ 197	\$ 240
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Building and Construction Inspector - Prevailing Wage

BCI Construction Inspector	\$ 160	\$ 190
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Forensics Engineering / Expert Testimony Fee Schedule Available Upon Request.

Expenses, such as special equipment, shipping costs, travel other than by automobile, parking expenses, and permit fees will be billed at the actual cost plus 15%. If the client requests, or the client's schedule requires work to be done on an overtime basis, a multiplier of 1.5 will be applied to the stated rates for weekdays for daily hours in excess of 8 as well as weekends, and a multiplier of 2.0 for daily hours in excess of 12 and holidays. If the client requests field services to be provided outside of normal working hours, a multiplier of 1.5 will be applied to the stated rates. For prevailing wage projects, if the client requests field services to be provided on any given Sunday, a multiplier of 2.0 will be applied to the stated rates; on or around an observed holiday, other rates may be applied. Survey Crews and Automation Field staff are billed portal to portal. A minimum charge of four hours will be charged for any Automation Field Service calls outside of normal working hours. The stated rates are subject to change, typically on an annual basis.

(effective 10/1/2023)



PREVAILING WAGE INFORMATION REQUEST

Thank you for this opportunity to be of service on your public works project. Please complete and return this form to allow us to comply with California’s prevailing wage requirements. Thank you!

Legal Name of Cannon	Cannon Corporation
PWC Registration No.	1000001861
Cannon Project Number	

PUBLIC WORKS PROJECT REGISTRATION INFORMATION:

Client’s Project Name	
DIR Project ID (PWC-100)	
Applicable Bid Advertisement Date	
Client’s Representative for DIR Project ID Information	Name: E-mail: Phone No.:
Labor Compliance Program (LCP) Applicable to this Project?	Yes <input type="checkbox"/> or No <input type="checkbox"/> If yes, please confirm if Cannon will be subject to the LCP and provide a copy of the LCP manual to Cannon before the start of the project. Thank you.



ACCEPTANCE OF PROPOSAL

Proposal Date:	<u>11/17/2023</u>
Client:	<u>Cambria CSD</u>
	<u>1316 Tasmen St, Suite 201</u>
	<u>Cambria, CA 93428</u>
Project:	<u>Stuart Street Tank Replacements</u>
Scope of Work:	<u>Design and engineering for the replacement of the Stuart Street Tanks</u>
T&M Not to Exceed:	<u>\$187,667.00</u>

Appendix A details the terms for work. Cannon bills monthly for work in progress and payment is due within 10 calendar days of invoice date. Overdue amounts will be surcharged at 18 percent per annum or 1.5 percent monthly. Materials are charged at cost plus 25% (+ tax). Reimbursable Expenses are not included in fixed fee; see enclosed "Reimbursable Expense Schedule" for rates. The fees are based upon current California Prevailing Wages; please provide us with the DIR Project ID. If the client requests, or the client's schedule requires work to be done on an overtime basis, a multiplier of 1.5 will be applied to the above rates for weekdays for daily hours in excess of 8 as well as weekends and a multiplier of 2.0 for daily hours in excess of 12 and holidays.

Please indicate your acceptance of this proposal by signing below.

In witness whereof, the parties hereto have caused this agreement consisting of proposal letter, Appendix A and any other necessary and applicable documents to be executed of the date and year first above written. In Appendix A, Cannon Corporation hereinafter referred to as Cannon. The Client, as noted below, hereinafter referred to as Client.

Client:	<u>Cambria Community Services District</u>	<u>Cannon</u>
X	<u></u>	<u></u>
	<u></u>	<u>Larry P. Kraemer, PE</u>
	<u></u>	<u>Director, Public Infrastructure</u>
	<u>Client Representative Name and Title</u>	<u>C 44813</u>
Date:	<u></u>	<u></u>



APPENDIX A: TERMS FOR CANNON SERVICES

Section 1: The Agreement

- 1.1 The agreement between the above noted parties consists of the following terms, the attached proposal and any exhibits or attachments noted in the proposal. Together these elements will constitute the entire agreement superseding any and all prior negotiations, correspondence, or agreements either written or oral. Any changes to this agreement must be mutually agreed to in writing.

Section 2: Standard of Care

- 2.1 Data, interpretations, and recommendations by Cannon will be based solely on information provided to Cannon. Cannon is responsible for those data, interpretations, and recommendations, but will not be responsible for other parties' interpretations or use of the information developed.
- 2.2 Services performed by Cannon under this agreement are expected by the Client to be conducted in a manner consistent with the level of care and skill ordinarily exercised by members of this profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.
- 2.3 The Client agrees that Cannon may use and publish the Client's name and a general description of Cannon's services with respect to the project in describing Cannon's experience and qualifications to other Clients and prospective Clients. The Client also agrees that any patentable or copyrightable concepts developed by Cannon as a consequence of service hereunder are the sole and exclusive property of Cannon.
- 2.4 The Client recognizes that it is neither practical nor customary for Cannon to include all construction details in plans and specifications, creating a need for interpretation by Cannon or an individual who is under Cannon's supervision. The Client also recognizes that construction review permits Cannon to identify and correct quickly and at comparatively low cost professional errors or omissions that are revealed through construction, or errors or omissions committed by others due to misinterpretation of design documents, or due to other causes. For the foregoing reasons construction review is generally considered an essential element of a complete design professional service. Accordingly, if the Client directs Cannon not to provide construction monitoring, Cannon shall be held harmless for any and all acts, errors or omissions, except for those consequences which it reasonably could be concluded that Cannon's review services would not have prevented or mitigated.
- 2.5 Client acknowledges that Cannon is not responsible for the performance of work by third parties including, but not limited to, engineers, architects, contractors, subcontractors, or suppliers of Client.

Section 3: Billing and Payment

- 3.1 Client will pay Cannon on a monthly basis to be billed by Cannon. Prior to the start of the project, a retainer as specified in the proposal, is required. Invoices for the balance will be submitted to Client by Cannon and will be due and payable within 10 days of invoice date. If Client objects to all or any portion of any invoice, Client will so notify Cannon in writing within fourteen (14) days of the invoice date, identify the cause of the disagreement, and pay when due that portion of the invoice not in dispute. The parties will immediately make every effort to settle the disputed portion of the invoice. In the absence of written notification described above, the balance as stated on the invoice will be paid.
- 3.2 Invoices are delinquent if payment has not been received within thirty (30) days from date of invoice. Client will pay an additional charge of 1-1/2 (1.5) percent per month or 18% per year of any delinquent amount, excepting any portion of the invoiced amount in dispute and resolved in favor of Client. All time spent and expenses incurred (including any attorney's fees) in connection with collection of any delinquent amount will be paid by Client to Cannon per Cannon's current fee schedule. In the event Client



fails to pay Cannon within sixty (60) days after invoices are rendered, Client agrees that Cannon will have the right to consider the failure to pay Cannon's invoice as a breach of this agreement.

- 3.3 Client agrees that if Client requests services not specified herein, Client agrees to timely pay for all such services as extra work. Cannon will notify the Client prior to performance of services which are not specified in this agreement.
- 3.4 Client agrees that payment to Cannon is in no way contingent on the results of work by Cannon or on the outcome of any litigation.
- 3.5 Preparation for and/or travel time to client requested meetings will be charged at the hourly rate.
- 3.6 Billing rates are subject to change, typically on an annual basis.

Section 4: Additional Services

- 4.1 Additional services include making revisions in drawings, specifications or other documents when such revisions are:
 - Inconsistent with approvals or instructions previously given by the Client, including revisions made necessary by adjustments in the Client's program or project budget;
 - Required by the enactment or revision of codes, laws or regulations subsequent to the preparation of such documents.
- 4.2 Additional services includes providing services required because of significant changes in the project including, but not limited to, size, quality, complexity, the Client's schedule, or the method of bidding or negotiating and contracting for construction.
- 4.3 Where unexpected developments increase the scope of work as defined herein and/or prove the assumptions of this proposal invalid, Cannon will make a reasonable effort to contact the Client to discuss the effects and adjustment of cost.

Section 5: Site Access and Site Conditions

- 5.1 Client will grant or obtain free access to the site for all equipment and personnel necessary for Cannon to perform the work set forth in this agreement. Client will notify any and all possessors of the project site that Client has granted Cannon free access to the site. Cannon will take reasonable precautions to minimize damage to the site, but it is understood by Client that, in the normal course of work, some damage may occur and the correction of such damage is not part of this agreement unless so specified in the proposal.

Section 6: Ownership of Documents

- 6.1 All reports, maps, plans, field data, field notes, estimates and other documents, whether in hard copy or machine readable form, which are prepared by Cannon as instruments of professional service, shall remain the property of Cannon. The Client may retain copies, including copies stored on magnetic tape or disk, for information and for reference in connection with the occupancy and use of the project.
- 6.2 Because of the possibility that information and data delivered in machine readable form may be altered, whether inadvertently or otherwise, Cannon reserves the right to retain the original tapes/disks and to remove from copies provided to the Client all identification reflecting the involvement of Cannon in their preparation. Cannon also reserves the right to retain hard copy originals of all project documentation delivered to the Client in machine readable form, which originals shall be referred to and shall govern in the event of any inconsistency between the two.
- 6.3 The Client recognizes that changes or modifications to Cannon's instruments of professional service introduced by anyone other than Cannon may result in adverse consequences which Cannon can neither predict nor control. Therefore, and in consideration of Cannon's agreement to deliver its instruments of professional service in machine readable form, the Client agrees, to the fullest extent permitted by law, to hold harmless and indemnify Cannon from and against all claims, liabilities, losses, damages, and costs, including but not limited to attorney's fees, arising out of or in any way connected with the modification,



misinterpretation, misuse or reuse by others of the machine readable information and data provided by Cannon under this Agreement. The foregoing indemnification applies, without limitation, to any use of the project documents on other projects, for additions to this project, or for completion of this project by others, excepting only such use as may be authorized, in writing, by Cannon.

- 6.4 Client agrees that all reports and other work furnished to Client or his agents, which is not paid for, will be returned upon demand and will not be used by Client or others for any purpose whatsoever.

Section 7: Client Responsibilities

- 7.1 The Client shall provide full information including a program setting forth the Client's design objectives, constraints, and construction budget criteria.
- 7.2 The Client shall furnish a legal description, a certified land survey, and the services of a soil, structural, mechanical, electrical or other engineer or consultant services, and laboratory tests, inspections, or reports as required by law or as requested by Cannon to perform the functions and services required of this agreement. The information shall be furnished at the Client's expense and Cannon shall be entitled to rely upon the accuracy and completeness thereof.
- 7.3 The Client shall furnish all legal, accounting and insurance counseling services as may be necessary at any time for the project, including auditing services the Client may require to verify the Contractor's Applications for Payment or to ascertain how or for what purposes the Contractor uses the moneys paid by the Client. The information above shall be furnished at the Client's expense, and Cannon shall be entitled to rely upon the accuracy and completeness thereof.
- 7.4 If the Client observes or otherwise becomes aware of any fault or defect in the project or nonconformance with the Contract Documents, prompt written notice shall be given by the Client to Cannon.
- 7.5 The Client shall furnish information and shall review Cannon's work and provide decisions as expeditiously as necessary for the orderly progress of the project and of Cannon's services.

Section 8: Insurance

- 8.1 Cannon represents and warrants that it and its agents, staff and consultants employed by it, is and are protected by worker's compensation insurance and that Cannon has such coverage under public liability and property damage insurance policies which Cannon deems to be adequate. Certificates for all such policies of insurance shall be provided to Client upon request in writing. Within the limits and conditions of such insurance, Cannon agrees to indemnify and save Client harmless from and against any loss, damage or liability arising from any negligent acts by Cannon, its agents, staff, and consultants employed by it. Cannon shall not be responsible for any loss, damage or liability beyond the amounts, limits, and conditions of such insurance. Cannon shall not be responsible for any loss, damage, or liability arising from any acts by Client, its agents, staff, and other consultants employed by Client.

Section 9: Termination

- 9.1 This agreement may be terminated by either party seven (7) days after written notice in the event of any breach of any provision of this agreement or in the event of substantial failure of performance by the other party, or if Client suspends the work for more than three (3) months. In the event of termination, Cannon will be paid for services performed prior to the date of termination plus reasonable termination expenses including the cost of completing analyses, records and reports necessary to document job status at the time of termination.
- 9.2 Failure of the Client to make payments to Cannon when due in accordance with this agreement shall be considered substantial nonperformance and cause for termination. If the Client fails to make payment when due to Cannon for services and expenses, Cannon may, upon seven (7) days written notice to the Client, suspend performance of services under this agreement. Unless payment in full is received by Cannon within seven (7) days of the date of the notice, the suspension shall take effect without further notice. In the event of a suspension of services, Cannon shall have no liability to the Client for delay,



damage, loss of agency approvals, loss of financing, interest expenses, etc. caused to the Client because of such suspension of service.

Section 10: Disputes Resolution

- 10.1 All claims, disputes, and other matters in controversy between Cannon and Client arising out of or related to this agreement will be submitted to "alternative dispute resolution" (adr) such as mediation and/or arbitration, before and as a condition precedent to other remedies provided by law. If and to the extent Client and Cannon have agreed on methods for resolving such disputes, then such methods will be set forth in the "alternative dispute resolution agreement" which, if attached, is incorporated and made a part of this agreement.
- 10.2 If a dispute at law related to the services provided under this agreement and that dispute requires litigation instead of adr as provided upon, then:
1. The claim will be brought and tried in judicial jurisdiction of the court of the county where Cannon's principal place of business is located and Client waives the right to remove the action to any other county or judicial jurisdiction, and
 2. The prevailing party will be entitled to recovery of all reasonable costs incurred, including staff time, court costs, attorney's fees, and other claim related expenses.

Section 11: Assigns

- 11.1 Cannon shall not assign this agreement in whole or in part nor shall it subcontract any portion of the work to be performed hereunder; except that Cannon may use the services of persons or(?) entities not in our employ when it is appropriate and customary to do so. Such persons and entities include, but are not necessarily limited to, specialized consultants and testing laboratories. Cannon's use of others for additional services shall not be unreasonably restricted by the Client provided Cannon notifies the Client in advance.

Section 12: Governing Law and Survival

- 12.1 The law of the State of California will govern the validity of these terms, their interpretation and performance.
- 12.2 If any of the provisions contained in this agreement are held illegal, invalid or unenforceable, the enforceability of the remaining provisions will not be impaired. Limitations of liability and indemnities will survive termination of this agreement for any cause.

Section 13: Limitation of Liability

- 13.1 To the fullest extent permitted by law, the total liability, in the aggregate, of Cannon and Cannon's officers, directors, employees, agents and independent professional associates and consultants, and any of them, to Client and anyone claiming by, through or under Client, for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in any way related to Cannon's services, the project or this agreement from any cause or causes whatsoever, including but not limited to the negligence, errors, omissions, strict liability or breach of contract of Cannon or Cannon's officers, directors, employees, agents and independent professional associates and consultants, or any of them, shall not exceed the total compensation received by Cannon under this agreement, or the total amount of \$50,000.00, whichever is greater.

Section 14: Hiring Cannon's Employees

- 14.1 From time to time, Clients who have come to know and work with our employees in the course of a project wish to hire them to work as the Client's own in-house employees. We pride ourselves on recruiting, hiring, and training the very best employees possible, and in assigning to projects our employees who best meet our Clients' individual needs. Our goal is to have our Clients view Cannon and its individual employees as indispensable.



- 14.2 Client agrees to pay Cannon a finder's fees equal to 12 months of the employee's current salary or wage for each of our employees whom the client(?) choose to hire, either directly or indirectly. Client acknowledges and agrees that the finder's fee is both fair and reasonable, and is equivalent to a recruiting or "headhunter's fee" that Client would expect to pay to a third party for locating and recruiting an employee of the caliber of the hired Cannon employee.
- 14.3 This Section 14 shall be limited to those of Cannon's employees with whom Client works or is introduced by Cannon during the course of this engagement, and shall be applicable to such employees both during his/her employment with Cannon and for a period of six (6) months thereafter. This Section 14 shall survive the cancellation or expiration of this Agreement.

Section 15: Prevailing Wage

- 15.1 Cannon acknowledges the requirements of California Labor Code Sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. To the extent required by the California Labor Code, Cannon shall fully comply with and require its subconsultants to fully comply with such Prevailing Wage Laws.
- 15.2 Pursuant to Labor Code Sections 1725.5 and 1771.1, Cannon and all its subconsultants performing work subject to prevailing wage must be registered with the Department of Industrial Relations and submit their certified payroll records directly to the DIR. In order to do so, the awarding body needs to complete the PWC-100 (Public Works Project Registration) within five days of awarding the contract; and provide Cannon with the DIR Project ID prior to the start of Cannon's work.



Stuart Street Tanks Replacement
Estimated Design Fees

Cambria Community Services District

Design Tasks	Sr. Principal Engineer		Associate Engineer		QA/QC Engineer		Sr. Project Engineer		Project Drafter		Engineering Assistant		Survey	Outside Services	Subconsultant Support Services	Total	
	Hourly Rate	\$248	\$200	\$270	\$185	\$168	\$115	\$380	LS							Hrs	Cost
Phase 1 - Preliminary Design																	
1 Project Kick Off Meeting	4	\$992	4	\$800							2	\$230				10	\$2,022
2 Research & Investigations																	
2.1 Site Reconnaissance / Field Visits	8	\$1,984	8	\$1,600			4	\$740								20	\$4,324
2.2 Utility Research	2	\$496	2	\$400			4	\$740	8	\$1,344	4	\$460				20	\$3,440
2.3 Document Review / Research	2	\$496	6	\$1,200			6	\$1,110			8	\$920				22	\$3,726
3 Topographical survey and Basemap									16	\$2,688			\$11,400			16	\$14,088
4 Geotechnical Investigations and Report														\$41,065	\$4,107		\$45,172
5 Environmental Documents																	
1 Project Management														\$4,500	\$450		\$4,950
2 Project Description														\$1,088	\$109		\$1,197
3 Biological No Effect Memo														\$3,154	\$316		\$3,470
4 Cultural Resources Survey Report														\$6,510	\$651		\$7,161
5 NEPA Compliance														\$1,562	\$157		\$1,719
6 CEQA Compliance														\$3,500	\$350		\$3,850
7 Coastal Commission Exemption														\$3,500	\$350		\$3,850
Phase 2 - Design																	
6 30% Plans	8	\$1,984	16	\$3,200	4	\$1,080	16	\$2,960	60	\$10,080	16	\$1,840				120	\$21,144
7 90% Plans, Specifications, and Cost Estimates	8	\$1,984	16	\$3,200	4	\$1,080	16	\$2,960	40	\$6,720	12	\$1,380				96	\$17,324
8 FINAL Plans, Specifications, and Cost Estimates	4	\$992	8	\$1,600	4	\$1,080	8	\$1,480	32	\$5,376	8	\$920				64	\$11,448
9 Bid Package Preparation	2	\$496	4	\$800	2	\$540	4	\$740	24	\$4,032	8	\$920				44	\$7,528
Phase 3 - Construction Bidding Services																	
10 Respond to RFI's	4	\$992	8	\$1,600							4	\$460				16	\$3,052
11 Bid Review	2	\$496	2	\$400	2	\$540										6	\$1,436
Sub Total	44	\$10,912	74	\$14,800	16	\$4,320	58	\$10,730	180	\$30,240	62	\$7,130	\$11,400	\$64,879	\$6,490	434	\$160,901
Phase 4 - Construction																	
12 Kickoff Meeting	4	\$992			4	\$1,080					2	\$230			\$250	10	\$2,552
13 Site Visit / Meeting	8	\$1,984			8	\$2,160					4	\$460			\$250	20	\$4,854
14 Submittal Reviews	8	\$1,984	8	\$1,600	16	\$4,320					8	\$920				40	\$8,824
15 RFI Review and Responses	4	\$992	8	\$1,600					8	\$1,344	4	\$460				24	\$4,396
16 As-Built Drawings	4	\$992	4	\$800			4	\$740	16	\$2,688	8	\$920				36	\$6,140
Sub Total	28	\$6,944	20	\$4,000	28	\$7,560	4	\$740	24	\$4,032	26	\$2,990			\$500	130	\$26,766

Totals 564 \$187,667



354 Pacific Street
San Luis Obispo, CA 93401
805-329-4773 **PHONE**
805-904-6532 **FAX**

January 30, 2024

James Green
Water Systems Superintendent
Cambria Community Services District
Delivered electronically – jgreen@cambriacsd.org

Re: Scope Amendment 1 – Stuart Street Tanks Replacement Project

Dear Mr. Green,

As requested by the District, MKN and Associates (MKN) has prepared this Scope Amendment 1 (SA) to document the change in project scope for the design of bolted steel tanks as discussed in the proposal for Stuart Street Tanks Replacement Project – Revision 1 (Proposal) to the design of welded steel tanks. It is not anticipated that welded steel tanks will have significantly different foundation requirements, and the level of effort for engineering design services will remain the same. This SA is intended to document that all references to bolted steel tanks in the Proposal will now reference welded steel tanks.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jon Hanlon', with a long, sweeping horizontal stroke extending to the right.

Jon Hanlon, PE
Principal Engineer



Protective & Marine Coatings

COLOR System

THE 4000 SERIES



we put
color
to work

Products available using Maxitoners colorants:

- Acrolon™ 218 HS Polyurethane
- Acrolon™ Ultra
- ArmorSeal® 1000HS
- ArmorSeal® HS Floor Enamel
- ArmorSeal® 650 SL
- ArmorSeal® Rexthane I
- Corothane® I MCU
- Epolon™ II Multi-Mil
- Fast Clad® DTM Mastic
- Fast Clad® DTM Urethane
- Fast Clad® Urethane
- Hi-Solids Polyurethane
- Pro Industrial™ Enamel
- Pro Industrial™ Enamel HS
- Pro Industrial™ Enamel VOC
- Pro Industrial™ Urethane Alkyd
- Kem® 4000
- Macropoxy® 646
- Macropoxy® High Solids
- Metalastic® DTM Enamel
- Polyton HP
- Polysiloxane XLE-80
- SherThane® 2K Urethane
- SteelMaster™ 9500
- Tile-Clad® High Solids

Safety Colors are available in the following:

- Acrolon™ 218 HS
- Acrolon™ Ultra
- Corothane® I MCU
- DTM Acrylic Coating
- FluoroKem
- Hi-Solids Polyurethane
- Pro Industrial™ Enamel
- Pro Industrial™ Enamel HS
- Pro Industrial™ Enamel VOC
- Pro Industrial™ Urethane Alkyd
- Kem® 4000
- Macropoxy® 646
- Metalatex® Semi-Gloss Acrylic
- Polyton HP
- Sher-Cryl HPA Acrylic
- Steel Master™ 9500
- Tile-Clad® HS Epoxy
- Waterbased Acrolon 100
- Waterbased Industrial Enamel

Products available using EnviroToner colorants:

- ArmorSeal® 1K
- Bond-Plex WB Acrylic
- DTM Acrylic Coating
- Fast Clad® HB Acrylic
- ArmorSeal® Floor-Plex 7100
- HydroGloss WB Urethane
- Metalatex® S/G
- Sher-Cryl™ HPA Acrylic
- SprayLastic® Exterior WB Dryfall
- ArmorSeal® Tread-Plex™
- Waterbased Acrolon 100
- Waterbased Catalyzed Epoxy
- Waterbased Industrial Enamel
- Waterbased Tile Clad Epoxy
- Waterborne Acrylic Dryfall



With almost 150 years of experience, Sherwin-Williams is the leader in Protective and Marine coatings. Our ongoing commitment to research and development, coupled with our highly trained business development managers and renowned technical support, ensure you always receive the products, services and answers you need when you need them. And, with scores of locations throughout the world, we'll fulfill your needs quickly, efficiently and correctly.

But it doesn't stop there. As an innovation leader, Sherwin-Williams takes great pride in introducing new technologies. As the industry leader, our waterborne coatings offer superior performance characteristics for virtually any Protective and Marine application.

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Developing innovative Protective and Marine coatings takes a lot of experience. Delivering them as complete, unique solutions in your industry takes even more. At Sherwin-Williams, we've worked hard to become the industry leader - and whether you need better durability, improved productivity or environmental compliance, our revolutionary products and technologies deliver results. We're more than a coatings manufacturer. We're a strategic source helping you stay on top of your business.



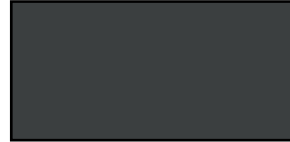
Sherwin-Williams can develop a customized color program for your facility that will meet your objectives and budget considerations. Contact your Sherwin-Williams representative for qualifying information.



Protective & Marine Coatings



Umbra SW 4008
LRV 9%



Graphite SW 4017
LRV 5%



Slate Gray SW 4026
LRV 36%



Bolt Brown SW 4001
LRV 8%



Walnut Brown SW 4009
LRV 3%



Tower Gray SW 4018
LRV 18%



Galvano SW 4027
LRV 58%



Modular Tan SW 4002
LRV 26%



Pumice Stone SW 4010
LRV 23%



Flint Gray SW 4019
LRV 47%



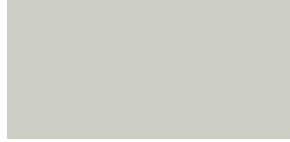
Gypsum ❖ SW 4028
LRV 72%



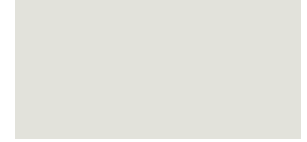
Pallet Tan SW 4003
LRV 49%



Mortar SW 4011
LRV 43%



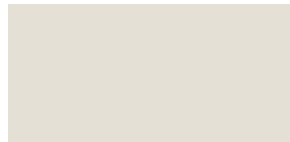
Zephyr SW 4020
LRV 63%



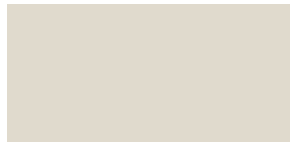
Pillar White SW 4029
LRV 77%



Tannery • SW 4004
LRV 64%



Cirrus White SW 4012
LRV 74%



Filament SW 4021
LRV 72%



Nickel SW 4030
LRV 47%



Cylinder Cream SW 4005
LRV 74%



Ballast Beige SW 4013
LRV 65%



Balsam SW 4022
LRV 62%



Structural Gray SW 4031
LRV 24%



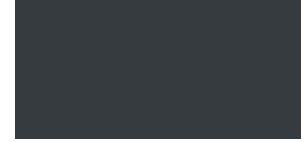
Lodestone SW 4006
LRV 51%



Cantilever Tan SW 4014
LRV 48%



Olivine SW 4023
LRV 46%



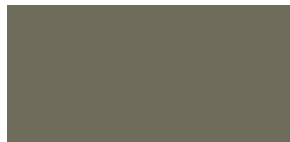
Vacuum Black SW 4032
LRV 4%



Bronze SW 4007
LRV 23%



Torque Tan SW 4015
LRV 35%



Enviro Green SW 4024
LRV 15%



Brass ❖ SW 4033
LRV 48%



Corrugate Brown SW 4016
LRV 24%



Anchor Gray SW 4025
LRV 13%

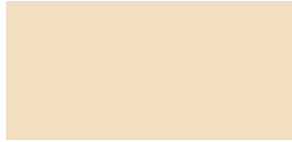


Junction Yellow • SW 4034
LRV 69%

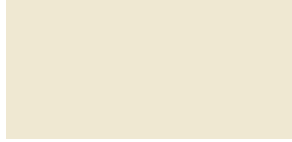
For INTERIORS use only with:

- ❖ CCE
- EnviroToners
- CCE or EnviroToners





Optic Yellow SW 4035 LRV 76%



Mill Ivory • SW 4036 LRV 81%



Silica SW 4037 LRV 59%



Copperplate SW 4038 LRV 31%



Thermal Orange SW 4039 LRV 18%



Deck Red SW 4040 LRV 8%



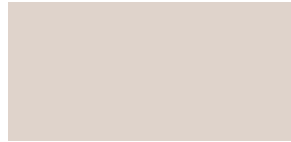
Precision Plum SW 4041 LRV 15%



Magnetic Mauve SW 4042 LRV 29%



Bearing Taupe SW 4043 LRV 50%



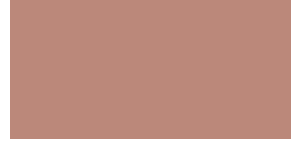
Quartzite SW 4044 LRV 67%



Ceramic Buff SW 4045 LRV 73%



Carousel Coral SW 4046 LRV 53%



Firedust SW 4047 LRV 30%



Mason Brick SW 4048 LRV 8%



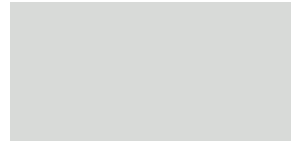
Camshaft SW 4049 LRV 12%



Voltage Violet SW 4050 LRV 36%



Rhombus SW 4051 LRV 56%



Argent SW 4052 LRV 71%



Cool Blue SW 4053 LRV 69%



Basin SW 4054 LRV 51%



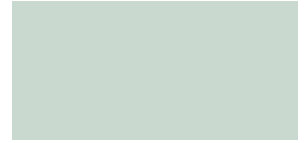
Polymer Blue SW 4055 LRV 33%



Blueprint SW 4056 LRV 6%



Toggle Teal SW 4057 LRV 28%



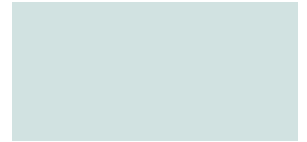
Current SW 4058 LRV 67%



Conductor Blue SW 4059 LRV 31%



Off Shore SW 4060 LRV 50%



Hydro Blue SW 4061 LRV 74%



Spillway SW 4062 LRV 60%



Robotic Blue SW 4063 LRV 31%



we put color to work



Turbine Blue SW 4064
LRV 18%



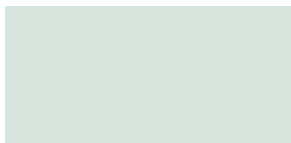
Techno Teal SW 4065
LRV 21%



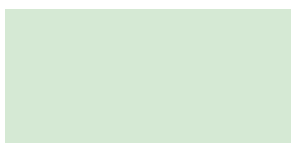
Rotor Turquoise SW 4066
LRV 37%



Dewpoint SW 4067
LRV 56%



Alloy Aqua SW 4068
LRV 76%



Emerald Ice • SW 4069
LRV 78%



Generator Green SW 4070
LRV 44%



Rain Forest SW 4071
LRV 8%



Cedar Green ■ SW 4072
LRV 3%



Recycled Red ■ SW 4073
LRV 26%



Power Orange • SW 4074
LRV 34%



Green Byte • SW 4076
LRV 44%



Circuit Breaker • SW 4077
LRV 32%



Kinetic Teal SW 4078
LRV 23%



Laser Blue SW 4079
LRV 16%



Plumb SW 4080
LRV 17%



ANSI #61 Gray



ANSI #70 Gray

Safety Colors



Safety Red SW4081
LRV 11%



International Orange SW4082
LRV 17%



Safety Orange SW4083
LRV 17%



Safety Yellow SW4084
LRV 28%



Safety Green • SW4085
LRV 29%



Safety Blue SW4086
LRV 17%



Black SW4090
LRV 0%



Silver Brite® SW4091 B59S11
Industrial Aluminum Paint B59S4

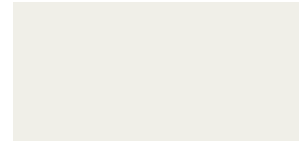
Whites



Ultra White LRV 88%



Extra White LRV 86%



Pure White LRV 85%

Primers



Off White



Buff/Tan



Zinc Clad™ Primers
Varies by Product Line



Gray



Red Oxide

FluoroKem Colors



Bright Yellow B65YW552



Safety Red B65R550



Safety Yellow B65Y550



Green B65G550



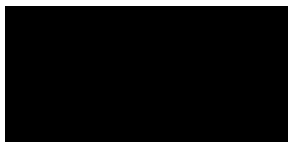
Gold B65YW551



Blue B65L550



Terra Cotta B65RW551



Black B65B550



Red Oxide B65RW552



White B65W550



Hi-Temp Colors



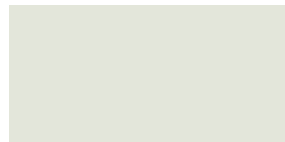
Cirrus Gray HT1



Shale Gray HT2

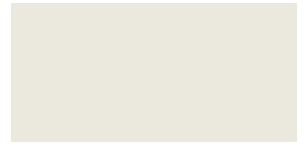


Thunder Gray HT3



New Toned White HT4

NSF Colors



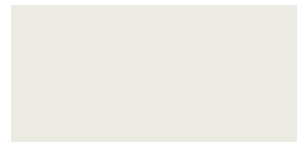
Mill White NSF1



Buff NSF2



Light Blue NSF3

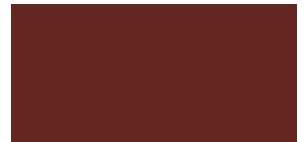


Sanitary White NSF4

ControlTech Colors



Haze Gray CT1



Tile Red CT2

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Color approximates the appearance of the actual coating. Factors such as the type of product, degree of gloss, texture, size and shape of area, lighting, heat, or method of application may cause color variance. Performance of certain colors may be affected by specific exposure environments. Not all colors are available in all Product lines. Contact your local Sherwin-Williams representative for color availability of each product. NOTE: For uniformity of color and gloss, some colors may require multiple coats.

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AD0272 11/14

655-2103

Stuart Street Kickoff Meeting

Agenda

Introductions and assignment of Primary Team contacts.

Project Overview and background on the 1992 constructed tanks. The current layout consists of two tanks: Tank I has a storage capacity of 212,000 Gal, and Tank II has a capacity of 125,000 Gal. Both tanks are 24' tall and of bolted steel design.

Due to the project site and funding obligations, CEQA, NEPA, and Coastal Development Permit requirements will be evaluated throughout the project.

Scope of Work

- **Preliminary Engineering**- Data Collection, Topographic Survey, Geotechnical Engineering Report.
- **Design Phase Services**- 30%, 90%, and 100% Construction Documents.
- **Environmental Permitting**- Addendum to Initial Study Mitigated Negative Declaration (2011), Biological Resources Memorandum, Cultural Resources Memorandum, and Pre-application package for CDP Exemption.
- **Bid & Construction Phase Services**- attend pre-bid conference, five construction coordination meetings, two requests for information (RFI's), and fifteen (15) submittal reviews. (The district must provide a third-party inspector for certain project completion phases.)

Discussion Items

- Access for Surveying and environmental assessment.
- Data Needs/ Discussion items
- Record drawings/ as-built plans
- Coating preferences: a decision for color needs to be determined at the onset, as it will be required to be identified in our permitting submission.
- "Call for Water" process for pumping and tank fill.
- Preference for internal tank mixing system.

Other site considerations

- Lighting
- Fencing (Increase the security of perimeter fence)
- Drainage
- Generator use during construction.

Construction Sequencing

- Phasing options for tank removal and construction. Plumb additional temporary tanks for supplemental volume during the installation phases.
- Staging area.

- Booster pump operation during construction.

CAMBRIA COMMUNITY SERVICES DISTRICT

TO: Resources and Infrastructure Committee

AGENDA NO. **4.B.**

FROM: James Green, Utilities Department Manager
Cody Meeks, Water Systems Superintendent

Meeting Date: February 12, 2024

Subject: Discussion and Consideration of
a Recommendation to the CCSD
Board of Directors Regarding
Approval of an Agreement for
Contractor Services for Replacing
San Simeon Well 3 Pump

RECOMMENDATIONS:

It is recommended that the R&I Committee review staffs' recommended proposal from (contractor) for the replacement of the San Simeon Well 3 (SS3) pump.

FISCAL IMPACT:

The estimated cost of the SS3 pump replacement based on the proposal provided by the contractor is \$45,260.80. However, the Board approved a budget adjustment of \$48,000 at its December 14th meeting. It will be funded from Water Fund reserves. Water Fund cash flow reserves are \$3,171,037 as of June 30, 2023.

DISCUSSION:

Recent wellhead operations at the SS3 have resulted in the final stages of duty life cycle operation for the 50 HP vertical turbine motor and pump installed in May 1985. Recent inspections have revealed that a harmful vibration is becoming increasingly severe. Diagnosis of the vibration demonstrates that it is coming from the impeller cup bowl assembly (15 Stage). Over time, uneven wear has occurred on the cup assemblies, resulting in wear to the tube and shaft. This recent vibration has also affected the pump motor life, causing extreme heat during daily production runs from this wellhead. SS3 produced 154.11 AF in the calendar year 2022. This yield was 30.44% of the total production for the community in 2022.

Repair for this failure involves removing the vertical turbine motor, 120' tube, shaft, and impellers by crane. Once the motor and pump assemblies are removed, a video camera inspection of the well casing for the pump will be performed to evaluate its condition. The new pump will then be installed with new discharge piping and a new pump head, and the discharge piping will be connected from the pump head to the water transmission piping. This new submersible pump and motor (similar to the installed at SR 4 in May 2022) will considerably reduce appliance noise and energy consumption while providing a return on investment and positively influencing climate action planning.

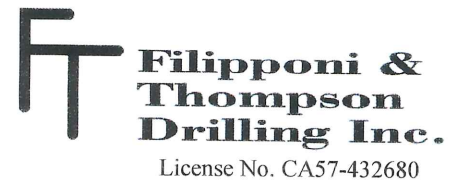
At its December 14th meeting, the Board of Directors approved a public works contract with 3rd Generation Pump and Well and a budget adjustment of \$48,000 for the replacement of the SS3 well pump and the installation of a VFD and associated electrical components. 3rd Generation Pump and Well was unable to perform the work for the price quoted due to their unexpectedly high bond costs and dropped out of their contract. Staff proceeded to obtain three (3) new and updated quotes from qualified contractors. Those

quotes, as well as staff's recommendations, are presented here. (contractor) is the lowest cost, qualified bid, and is the one staff is recommending R&I approve.

It is recommended that R&I approve and forward to the Board of Directors for discussion and consideration the proposal from (contractor) for replacing the San Simeon Well 3 (SS3) pump and associated work.

Attachments: Filiponi and Thompson 2024
Miller Drilling Company 2024
Precision Hydro

Filipponi & Thompson Drilling, Inc.
 PO Box 845
 Atascadero, CA 93423



TEL: (805)466-1271 FAX: (805)466-2388

Estimate

NAME / ADDRESS
CAMBRIA COMMUNITY SERVICES DISTRICT SMEEKS@CAMBRIACSD.ORG

DATE	ESTIMATE #
1/16/2024	1430

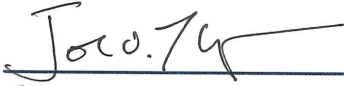
E-mail
SMEEKS@CAMBRIACSD.ORG
Project
CAMBRIA SERVICE DISTRICT - WELL ...

DESCRIPTION	QTY	COST	TOTAL
ESTIMATE TO: PULL EXISTING TURBINE AND INSTALL SUBMERSIBLE PUMP FILIPPONI & THOMPSON DRILLING NOT RESPONSIBLE FOR CONTROL WIRING. THIS ESTIMATE IS SITE UNSEEN SO ACTUAL BILLING WILL REFLECT SITE CONDITIONS: INCLUDES TIE IN TO EXISTING PLUMBING UNLESS ABNORMAL PLUMBING. GRUNDFOS 385S500-6 (400GPM@350') FRANKLIN DR56 50/60 MOTOR 63' - 6" GALVANIZED DROP PIPE @ 30 70' - #4/4 PVC JACKETED SUB CABLE 70' - 1" TRANSDUCER TUBE 12X6 WELL SEAL MISC. (WELL HEAD, ELECTRICAL, TAPE, SPLICES)		31,245.50	31,245.50T
LABOR	1	10,000.00	10,000.00
WELL VIDEO	1	1,750.00	1,750.00
FREIGHT - TO BE DETERMINED			
Sales Tax		7.25%	2,265.30

To accept this offer, please sign below and return this contract with your \$18,000 deposit

TOTAL \$45,260.80

THIS OFFER WILL EXPIRE AFTER 30 DAYS UNLESS ACCEPTED.


 Operator

Signature _____ Date _____

I ACCEPT THE ABOVE OFFER

329 North Main Street
Templeton, CA 93465



805-434-1888 main
805-434-2384 fax

www.millerdrillingcompany.com

PUMP ESTIMATE

1/17/2024

CAMBRIA CSD
P.O. BOX 65
CAMBRIA, CA 93428

Project

Terms

Net 15 days

State Drilling Contractor License # 324634

Description	Qty / Feet	Price Each	Total
** SS# 3 ** SUBMERSIBLE PUMP **			
50 HP 3 PHASE 460 VOLT 6" SUBMERSIBLE MOTOR	1	11,103.00	11,103.00T
385S500-6 PUMP END ONLY	1	6,069.00	6,069.00T
NIPPLE 4" X 12" STAINLESS STEEL	1	142.00	142.00T
REDUCER 6" X 4" STAINLESS STEEL	1	750.00	750.00T
6" CERTA LOCK PVC DROP PIPE (PER FOOT)	120	72.10	8,652.00T
6" CERTA -LOK ADAPTERS STAINLESS STEEL	2	635.00	1,270.00T
6" CERTA -LOK COUPLING	1	198.00	198.00T
#4/4 JACKET SUBMERSIBLE PUMP CABLE (PER FOOT)	130	6.75	877.50T
SPLICE KIT	1	50.00	50.00T
FABRICATED WELL HEAD	1	1,500.00	1,500.00T
MISC. FITTINGS - FLEX, MAKE UP BOX, BANDING MATERIAL, GASKETS, DISCHARGE TIE IN MATERIALS, ETC.	1	1,200.00	1,200.00T
10 MIL TAPE	10	9.90	99.00T
1" SOUNDING TUBE SCH 40 PVC (PER FOOT)	130	1.65	214.50T
1/2" CHLORINE INJECTION TUBE SCH 40 PVC (PER FOOT)	130	1.00	130.00T
VIDEO INSPECTION OF WELL	1	1,000.00	1,000.00
LABOR SERVICE CALL 8/3/2023 TROUBLE SHOOT (PREVAILING WAGE)	1.25	282.00	352.50
STINGER CRANE LABOR TO PULL TURBINE PUMP FROM WELL AND REMOVE ALL OLD MATERIAL FROM SITE (PREVAILING WAGE)	10	551.00	5,510.00
STINGER CRANE LABOR TO INSTALL SUBMERSIBLE PUMP IN TO WELL (PREVAILING WAGE)	8	551.00	4,408.00
WELD LABOR TO FABRICATE DISCHARGE TIE IN MATERIALS (PREVAILING WAGE)	6	227.00	1,362.00

Accepted by: _____

This job will not be scheduled until this estimate has been signed and original copy is returned with a deposit of 40% of the total amount due. This estimate will expire in 30 days unless accepted.

Seller, for security purpose, retains title to described goods until paid according to terms. Buyer assumes risk of loss or damage to described goods upon delivery. In case of buyers default, seller or his agents may take possession of and remove described goods from buyers premises or elsewhere without prior notice. Buyer waives all rights of action for trespass, damage or other cause resulting from repossession. Upon buyers default in payment, buyer agrees to pay a finance charge of 18% APR plus reasonable collection costs and actual attorney fees.



WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov

Subtotal \$44,887.50

Sales Tax (7.25%) \$2,338.49

Total \$47,225.99



Quotation for Permanent Pump

Date: 2/5/2024
Customer: Cambria Community School District
Customer Address:
City, State, Zip:

Project Name: Well 22-3 Submersible Pump Install
Project Address: San Simeon Creek rd
City, State, Zip:

Job No: 6###

Contact: Cody Meeks
Cell: 805.709.6097
Email: smeeks@cambriacsd.org
Alt. Contact:
Alt. Cell:
Alt. Email:

Job Description: Precision Hydro is pleased to provide the following proposal for removal of existing pump equipment, video survey of well, and installation of new 50HP Grundfos 385S500 Submersible Pump. Included is 80' of CertaLok Drop Pipe, new Discharge Head, and 1" Sounding Tube for water levels and 1/2" tube for chlorination.

Note: CCSD is responsible for disassembly and reassembly of well house as needed.

Item	Qty	Unit	Description	Unit Price	Total
10	1	LS	Mob/Pull/Dispose of Pump	\$7,400.00	\$7,400.00
20	1	LS	Video Survey	\$1,800.00	\$1,800.00
30	1	LS	Mob/Install New Pump Equip/Perform Startup	\$7,150.00	\$7,150.00
40	1	LS	BOM: New Sub Pump and Materials	\$17,718.55	\$27,814.21

Cost Breakdown

			Labor		\$16,350.00
			Materials		\$27,818.80
			Local Ag Sales Tax	7.25%	\$2,016.53
			Freight		\$100.00

Total Estimated Contract Price:					\$46,285.33
----------------------------------------	--	--	--	--	--------------------

Precision Hydro (PH) Standard Terms and Conditions apply and all invoices are due on date issued and subject to 1.5% interest per 30-days thereafter. Terms include 25% of cost at acceptance of quote, 25% once materials are received, and 50% each line or task completion. **PH** is a dba of Pacific Coast Well Drilling. This quote is not at Prevailing Wage rates. At the discretion of accounting, a 20-day preliminary notice may be filed. This is neither a lien nor a reflection on the integrity of any person or business, but simply a notice as prescribed in California Civil Code sections 3097 and 3098. PH estimated charges would not be exceeded without prior written authorization from the Owner. **PH** Warranty is restricted to materials supplied. Quote is valid for 15 days.

Precision Hydro appreciates the opportunity to assist with this project and if you have any questions regarding the technical aspects of this project please do not hesitate to give me a call.

Precision Hydro

Cambria Community School District

2/5/2024

[Name]

Date

Name:

Date

CAMBRIA COMMUNITY SERVICES DISTRICT

TO: Resources and Infrastructure Committee

FROM: James Green, Utilities Department Manager
Tristan Reaper, Program Manager

AGENDA NO. **4.C.**

Meeting Date: February 12, 2024 Subject: Discussion and Consideration of the Alignment Alternatives for the San Simeon Well Field Water Transmission Main and Secondary Effluent Line Replacement Project

RECOMMENDATIONS:

It is recommended that the R&I Committee review staffs’ recommendation for the alignment alternatives of the San Simeon Well Field Water Transmission Main and Secondary Effluent Line replacement project. Staff and the consultant recommend Alternative 3 or Alternative 1-HDD with an extension to CCSD property (same ending place as Alternative 3).

FISCAL IMPACT:

The final budget for FY 23/24 that the Board approved on August 17, 2023, has \$600,000 allocated in the Water Department Budget for the design and preliminary costs for the San Simeon Water Main and Effluent Line Replacement Project. The Board approved a contract with Cannon on August 10th, not to exceed \$600,000 for design and preliminary cost services.

Construction estimates for each Alternative are listed in Attachment 3. A budget adjustment will need to be approved by the Board to cover the costs for the remaining project when they are identified and finalized.

DISCUSSION:

Background

In 1978, the CCSD constructed a new 14” diameter potable water transmission main from its well field located off San Simeon Creek Road to the center of town. This water transmission main is the primary source of drinking water for the community of Cambria. In 1979, the CCSD completed construction of a new 12” diameter outfall sewer (wastewater effluent pipeline) from its new Wastewater Treatment Plant (WWTP) in town to its wastewater percolation ponds located two miles to the north-west on CCSD property downgradient from the San Simeon Well Field and near the confluence of Van Gordon Creek. The pipelines include a span of approximately 2,300’ constructed within a 25’ wide easement through protected wetlands on California State Parks property.

During the 1990s, the water transmission main developed a leak that required repair within the State Parks easement. At that time, federally threatened California red-legged frogs were found in the area, which hampered repair efforts. Following this repair, a pipeline relocation project was conceived to avoid the Environmentally Sensitive Habitat Area (ESHA) crossed by the existing pipelines. A few years later, the project was put on hold because it was envisioned that the relocation of these pipelines could be coordinated with future pipeline work for a proposed desalination project. In December 2021, the water transmission main experienced a failure within a saturated area of wetlands along the alignment within the State Parks easement. A temporary overland bypass pipeline was constructed of a 12” diameter high-density polyethylene (HDPE) pipe several feet west of the State Parks easement alignment to address this emergency. Due to the emergency nature of the work and environmentally sensitive area, the temporary

bypass pipeline was constructed entirely above ground except where trenching was required to make connections to the existing main.

Project Description

The San Simeon Water and Wastewater Pipeline Replacement Project will replace the existing 14” diameter water transmission main and 12” diameter wastewater effluent pipeline. The replacement pipelines will begin at the north end of Exotic Gardens Drive near the dead end of the road just east of San Simeon Water & Wastewater Pipeline Replacement Project – Preliminary Design Report Chapter 1: Introduction Cambria Community Services District December 2023 1-2 Highway 1. The exact alignment is yet to be determined. However, the alignments will route the pipelines either under or around the protected wetlands on California State Parks property. The pipelines will end near the intersection of Washburn Campground Road & San Simeon Trail Access Road, approximately 100 feet south of the pedestrian bridge on Washburn Campground Road or approximately 450 feet northeast of the intersection of Washburn Campground Road & San Simeon Trail Access Road within CCSD property, north of the pedestrian bridge and south of the percolation ponds. The replacement pipelines will range in length from about 2,300 feet to 3,100 feet and be of similar diameter.

Alternatives

Alternative 1-HDD, with an extension to CCSD property, is recommended due to it following the existing easement, removing the fiscal impact of maintaining the pedestrian bridge, and the low environmental impact of HDD. The fiscal impact is similar to Alternative 3. Staff recommends this alternative for further consideration and study.

Alternative 1-CIPP uses a cured-in-place pipe (CIPP) to reinforce the existing water and effluent transmission mains in their current alignment. Due to limitations on the length of the CIP pipe liner, two additional intermediary pits will need to be excavated to perform the installation. These pits will have to be excavated within State Park property along the easement and will have significant impacts due to the entry of heavy equipment in a sensitive environment. The CIPP liner will reduce the transmission capacity of the water transmission main and the secondary effluent line. Permitting might be easier, though additional excavations will require environmental review. There are no cost savings associated with this alternative. Staff and consultants do NOT recommend CIPP for this project.

Alternative 1-Pipe Bursting. Pipe bursting, a method initially suggested, is considered infeasible for this project due to soil conditions and the construction and repair methods used on the existing pipelines and is dropped from further consideration. See attachment (Insert) for additional details and reasons for rejecting this option.

Alternative 2 is similar to Alternative 1-HDD and Alternative 3 by taking a more direct route and requiring a shorter bore path. This alignment will require acquiring a new right of way with the State Parks while still requiring a major work site within SS State Park and impacting the Washburn Campground Road. The CCSD would continue using the pedestrian bridge as a pipe bridge and incur fiscal impact to maintain it. Based on the benefits of Alternative 1 or Alternative 3, we recommend those in place of Alternative 2 as the fiscal impacts of the additional construction costs outweigh the cost of maintaining the aging pipeline and pedestrian bridge.

Alternative 3 is similar to Alternative 1-HDD, with the benefits of a slightly shorter bore path. However, it would require the acquisition of a new easement and an agreement with State Parks to abandon the existing water and effluent transmission mains. The slightly deeper bore under the hills will require further geological evaluation to determine the HDD approach. Staff recommends this alternative for further consideration and study.

Alternative 4 is highly impacted by Caltrans requirements, which are challenging to meet. It is also the longest route and will still require a section of horizontal directional drilling (HDD) under the creek at the Washburn Day Use Area. Alignment Alternative 4 is routed within the public right-of-way of the San Simeon Trail Access Road owned by CA State Parks. The cost per foot for open-cut trenching is comparable to HDD (see Attachment Blank), so the longer route results in a higher total construction cost. Caltrans might completely deny a permit for this project, necessitating a possibly long and expensive appeals process. If Alignment Alternative 4 is selected, CCSD should anticipate the need for CCSD executives to deal directly with Caltrans District 5 management to obtain an encroachment permit. Staff and Consultants are NOT recommending this alignment.

Additional Geotechnical Services

Additional geotechnical services for alternatives 1 and 3 would include field exploration, laboratory testing, and preparation of a Geotechnical Report. Five bores are anticipated, with proposed depths at least 10 feet below the bottom of the pipeline trench. At a minimum, borings are proposed at the southern connection point of Exotic Gardens Road, on Washburn Campground Road, on San Simeon Trail Access Road.

Attachments: Alignment Alternatives Map
 Permit Summary Table
 Est Construction Cost Summary
 San Simeon Water-WW Pipeline Replacement PDR Draft V2 complete

Alignment Alternative	Estimated Construction Cost
Alternative 1-CIPP	\$ 2,488,000
Alternative 1-HDD	\$ 1,885,000
Alternative 2 - HDD	\$ 1,748,000
Alternative 3 - HDD	\$ 2,107,000
Alternative 4 – Open Cut Trench	\$ 2,805,000

Jurisdictional Agency	Permit Type	Processing Duration (months)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
USACE	Section 404 Clean Water Act Permit	6 - 8	May be required	May be required	May be required	Likely not required
CDF&W	Section 1602 Streambed Alteration Permit	4 - 6	May be required	May be required	May be required	NA
RWQCB	Section 401 Water Quality Certification	6 - 8	May be required	May be required	May be required	Likely not required
Caltrans	Encroachment Permit	4 - 6	NA	NA	NA	Required
State Parks	Right of Entry	4 - 6	No	May be required	May be required	NA
State Parks	Easement	4 - 6	No	Yes	Yes	No
SLO County	Encroachment Permit	3 - 4	Required	Required	Required	Required
SLO County (Coastal Commission)	Coastal Development Permit	8 - 12	May be required	May be required	May be required	Likely not required

Pipe Bursting Description

Pipe bursting is a trenchless pipe replacement construction method by which an existing pipe is split open and forced outward by an internal bursting tool. A cone-shaped hydraulic or pneumatic expansion head, part of the bursting tool, is pulled through the existing pipeline, typically using a chain or cable and winch. As the expansion head is pulled through the existing pipe, it pushes the pipe radially outward until it breaks apart, creating a space for the new pipe. The bursting tool also pulls the new pipeline behind it, immediately filling the void created by

the old burst pipe with the new pipe. Pipe bursting can replace the existing pipe with a same-sized pipe or a larger pipe. Pipe bursting is typically used on runs of 300 to 600 feet, although runs of 1,000 feet or more are also common. The record pipe bursting run is 2,800 feet. However, runs over 1,000 feet involve a high risk of potential failure. The San Simeon Water and Wastewater Pipeline Replacement Project includes several challenges associated with pipe bursting. Repair couplings along the length of the pipelines would be a problem to burst. Typically, such locations are identified, and open pit excavations are used to expose and remove the repair couplings. Due to the shallow depth of the existing pipelines, the excavation pits for the pipe-bursting equipment will need to be 25 feet long or more and 10 feet deep or more for the rig to get the necessary bearing area to pull against the existing soil. In addition, the soil is expected to be soft, making it even more difficult to secure the equipment to pull the new pipe through. Also, there is a 300-foot section of ductile iron pipe (DIP) on the wastewater line that will be difficult to burst, and going up the steep hill will be problematic.

The maximum recommended pipe bursting runs for the San Simeon Water and Wastewater Pipeline Replacement Project are 700 to 800 feet. This would require four pits with two intermediate pits in the middle of the wetlands. Construction equipment would have to run back and forth across the wetlands area. As a result of all these challenges, a pipe-bursting operation would have a similar impact on the wetlands as an open-cut trenching pipeline replacement. Therefore, pipe bursting is considered infeasible for this Project and is dropped from further consideration.

Pipe Lining

Cured-in-place pipe (CIPP) lining is a trenchless pipe replacement construction method used to rehabilitate existing pipes such as sanitary sewers, storm drains, and waterlines. The pipe being lined must be removed from service during the installation process. For sewer lines, bypass pumping of sewer flows is necessary. Before lining, the pipe is cleaned and video inspected. Local repairs may be required to badly deformed or damaged pipe sections. CIPP liners of non-woven polyester felt or fiber-reinforced fabric are custom-manufactured to fit the host pipe. Liners are impregnated with a polymer resin, which, when cured, will form a close-fitting liner pipe within the host pipe. The CIPP liner can have sufficient thickness when cured to sustain the loads imposed on the pipe by groundwater, internal service pressure, soil loads, and traffic loads. The liner is thoroughly saturated with polyester, vinyl ester epoxy, or silicate resin using vacuum, gravity, or other applied pressure. The resin includes a chemical catalyst or hardener to facilitate curing. The outermost layer of the liner tube is coated with a polymer film to protect the liner during handling and installation.

CIPP liners are typically installed using the inversion method. The inversion method employs a scaffold tower to apply water pressure to turn the liner inside out and push it into and along the Host pipe. CIPP liners may be inverted with air or water pressure. Liner lengths may vary from short sections over a joint or defect to common lengths of 300 to 600 feet. The record single section of CIPP liner is around 2,500 feet. Curing time is reduced through heating the internal air or water. Once the pipe cures, the curing water or steam condensate is removed, and the ends of the liner are trimmed flush with the pipe ends and sealed. Where applicable, when the lining is complete, the service connections are reinstated, and the pipe is returned to service, typically at a relatively high risk associated with the same day. For the San Simeon Water and Wastewater Pipeline Replacement Project, CIPP lining appears to be feasible. However, the 2,300 feet length

of existing water and wastewater pipelines is very close to the maximum length of the CIPP technology. Therefore, a relatively high risk is associated with using CIPP lining to replace the existing 14" diameter potable water transmission main and 12" diameter wastewater effluent pipeline. Other pipelining methods, such as sliplining and internal pipe coating, are not considered feasible for the San Simeon Water and Wastewater Pipeline Replacement Project either due to installation limitations of the technology or inability to address the existing problems.

5.4 Permitting Summary

Table 5-1 provides a preliminary summary of jurisdictional/permitting agencies, and associated permits.

Table 3-1. Preliminary Permitting Summary

Jurisdictional Agency	Permit Type	Processing Duration (months)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
USACE	Section 404 Clean Water Act Permit	6 - 8	May be required	May be required	May be required	Likely not required
CDF&W	Section 1602 Streambed Alteration Permit	4 - 6	May be required	May be required	May be required	NA
RWQCB	Section 401 Water Quality Certification	6 - 8	May be required	May be required	May be required	Likely not required
Caltrans	Encroachment Permit	4 - 6	NA	NA	NA	Required
State Parks	Right of Entry	4 - 6	No	May be required	May be required	NA
State Parks	Easement	4 - 6	No	Yes	Yes	No
SLO County	Encroachment Permit	3 - 4	Required	Required	Required	Required
SLO County (Coastal Commission)	Coastal Development Permit	8 - 12	May be required	May be required	May be required	Likely not required

Notes: .

Alignment Alternative	Estimated Construction Cost
Alternative 1-CIPP	\$ 2,488,000
Alternative 1-HDD	\$ 1,885,000
Alternative 2 - HDD	\$ 1,748,000
Alternative 3 - HDD	\$ 2,107,000
Alternative 4 – Open Cut Trench	\$ 2,805,000



Cambria Community Services District
San Simeon Water & Wastewater Pipeline Replacement Project
Preliminary Design Report

December 2023

Draft



Prepared for:
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1. INTRODUCTION

1.1 Background

The Cambria Community Services District (CCSD) provides water and wastewater services to the unincorporated coastal town of Cambria in San Luis Obispo County. The CCSD is located approximately 35 miles northwest of the City of San Luis Obispo with a service area of approximately 8.5 square miles. The CCSD water system serves approximately 3,782 residential and 228 non-residential customers. The water system consists of approximately 67 miles of waterline, 8 pressure zones, 3 booster stations, and 6 storage tanks with a total storage volume of 1.75 million gallons. The CCSD's drinking water supply is sourced from two creek aquifers, San Simeon and Santa Rosa, and pumped from five wells: San Simeon Wells 1, 2, and 3, and Santa Rosa Wells 3 and 4.

The CCSD wastewater systems consist of a 1.0 million gallon per day (MGD) wastewater treatment plant, approximately 60 miles of collection system sewer line, 10 lift stations, and four wastewater percolation ponds located two miles north-west of the plant within the CCSD's property located off San Simeon Creek Road. The CCSD also owns and operates an indirect potable reuse system known as the Water Reclamation Facility (WRF). The WRF consists of an advanced water treatment plant, extraction and injection wells, monitoring wells, conveyance piping, a lagoon discharge structure, and brine storage tanks. The WRF is located adjacent to the CCSD's wastewater percolation ponds.

In 1978 the CCSD constructed a new 14" diameter potable water transmission main from its well field located off San Simeon Creek Road to the center of town. The majority of the waterline was constructed of Class 150 Asbestos Cement Pipe (ACP), with short sections of ductile iron pipe (DIP) at a few key locations. This water transmission main is the primary source of drinking water for the community of Cambria. In 1979 the CCSD completed construction of a new 12" diameter outfall sewer (wastewater effluent pipeline) from its new Wastewater Treatment Plant (WWTP) in town to its wastewater percolation ponds located two miles to the north-west on CCSD property downgradient from the San Simeon Well Field and near the confluence of Van Gordon Creek. The majority of the wastewater effluent pipeline was also constructed of Class 150 ACP, also with short sections of DIP at a few key locations. The pipelines include a span of approximately 2,300' constructed within a 25' wide easement through protected wetlands on California State Parks property.

During the 1990s the water transmission main developed a leak that required repair within the State Parks easement. At that time, federally threatened California red-legged frogs were found in the area which hampered repair efforts. Following this repair, a pipeline relocation project was conceived as a means to avoid the Environmentally Sensitive Habitat Area (ESHA) crossed by the existing pipelines. A few years later the project was put on hold because it was envisioned that relocation of these pipelines could be coordinated with future pipeline work for a proposed desalination project. In December 2021, the water transmission main experienced a failure within a saturated area of wetlands along the alignment within the State Parks easement. To address this emergency, a temporary overland bypass pipeline was constructed of 12" diameter High Density Polyethylene (HDPE) pipe several feet west of the State Parks easement alignment. Due to the emergency nature of the work and environmentally sensitive area, the temporary bypass pipeline was constructed entirely above ground except where trenching was required to make connections to the existing main.

1.2 Project Description

The San Simeon Water and Wastewater Pipeline Replacement Project will replace the existing 14" diameter water transmission main and 12" diameter wastewater effluent pipeline. The replacement pipelines will begin at the north end of Exotic Gardens Drive near the dead end of the road just east of

Highway 1. The exact alignment is yet to be determined. However, the alignments will route the pipelines either under or around the protected wetlands on California State Parks property. The pipelines will end near the intersection of Washburn Campground Road & San Simeon Trail Access Road, approximately 100 feet south of the pedestrian bridge on Washburn Campground Road, or approximately 450 feet northeast of the intersection of Washburn Campground Road & San Simeon Trail Access Road within CCSD property, north of pedestrian bridge and south of the percolation ponds. The replacement pipelines will range in length from about 2,300 feet to 3,100 feet, and be of similar diameter. The new pipeline materials are yet to be determined, but will not include ACP. Pipeline construction methods may include open cut trenching (4' to 6' in depth), horizontal directional drilling (HDD), cured-in-place-pipe (CIPP), and pipe bursting.

1.3 Purpose and Scope

The first step in Project development is to prepare a Preliminary Design Report (PDR) to study multiple project implementation alternatives. More specifically, the purpose/objective of the PDR is to evaluate alternative alignments, construction methods and pipe materials, consider the potential environmental impacts, permitting requirements and costs of the various alternative alignments, determine the advantages and disadvantages of the alternative alignments, and develop preliminary design recommendations.

The Scope of Work for the PDR is summarized below. Development of the PDR includes our environmental and geotechnical subconsultants, SWCA and Yeh Associates, respectively, who provide constraints analysis to identify advantages and disadvantages of the various alternative alignments.

- ✓ Review previous studies and reports.
- ✓ Conduct right-of-way and utility research and coordination.
- ✓ Prepare base map.
- ✓ Develop alternative alignments.
- ✓ Perform hydraulic calculations.
- ✓ Conduct environmental and geotechnical research and constraints analysis.
- ✓ Review permitting, construction methods and other considerations.
- ✓ Prepare preliminary cost estimates.
- ✓ Evaluate advantages and disadvantages of various alternative alignments.
- ✓ Develop recommendations.
- ✓ Prepare Preliminary Design Report.

1.4 Constraints

There are always challenges and constraints in implementing any constructed facilities. Constraints are not necessarily roadblocks to implementation, and can be considered opportunities for innovation and creative solutions. At the PDR stage of the San Simeon Water and Wastewater Replacement Project, the following constraint categories have been identified and will be evaluated further in the subsequent chapters of this PDR.

- ✓ Right-of-way and easements
- ✓ Existing utilities
- ✓ Geotechnical
- ✓ Wetlands
- ✓ Biological resources
- ✓ Archeological resources
- ✓ Permitting
- ✓ Construction methods and constructability
- ✓ Construction cost

2. ALIGNMENT ALTERNATIVES

2.1 Potential Pipeline Realignments

Following initial site reconnaissance and research, six primary alternative alignments were identified as well as possible minor variations to a few of them. However, after further investigation, some alternatives were clearly far more costly, or very similar to another alternative. Therefore, the multiple alternatives and variations were consolidated down to four basic alternatives that are described below, and illustrated in Figure 2-1. All alternative alignments are considered technically, environmentally, and economically feasible. However, as discussed later in this PDR, each alternative has different challenges, advantages and disadvantages, and some are easier to implement than others.

2.2 Alternative 1 – Within Existing 25' Wide Easement

Alternative Alignment 1 begins at the north end of Exotic Gardens Drive, near the dead end of the road, just east of Highway 1. The alignment then follows a curved route and runs within the CCSD's existing 25' wide easement. Alternative Alignment 1 runs under the protected wetlands on California State Parks property. The alignment ends near the intersection of Washburn Campground Road & San Simeon Trail Access Road about 100' south of the pedestrian bridge on Washburn Campground Road. The total length of Alternative Alignment 1 is approximately 2,400 feet. Due to the environmental sensitivity of the wetlands area, trenching is not considered a feasible construction method. Alternative construction methods such as HDD, CIPP, and pipe bursting would be considered.

2.3 Alternative 2 – HDD to South of Washburn Campground Road Pedestrian Bridge

Alternative Alignment 2 begins at the north end of Exotic Gardens Drive, near the dead end of the road, just east of Highway 1. The alignment then follows a straight route, east of the CCSD's existing 25' wide easement, under the protected wetlands on California State Parks property to the intersection of Washburn Campground Road & San Simeon Trail Access Road. The alignment ends here about 100' south of the pedestrian bridge on Washburn Campground Road. The total length of Alternative Alignment 3 is approximately 2,350 feet. Due to the environmental sensitivity of the wetlands area, trenching is not considered a feasible construction method. HDD would be the construction method considered. A new 25' wide utility and access easement would be required for this alignment.

2.4 Alternative 3 – HDD to North of Washburn Campground Road Pedestrian Bridge

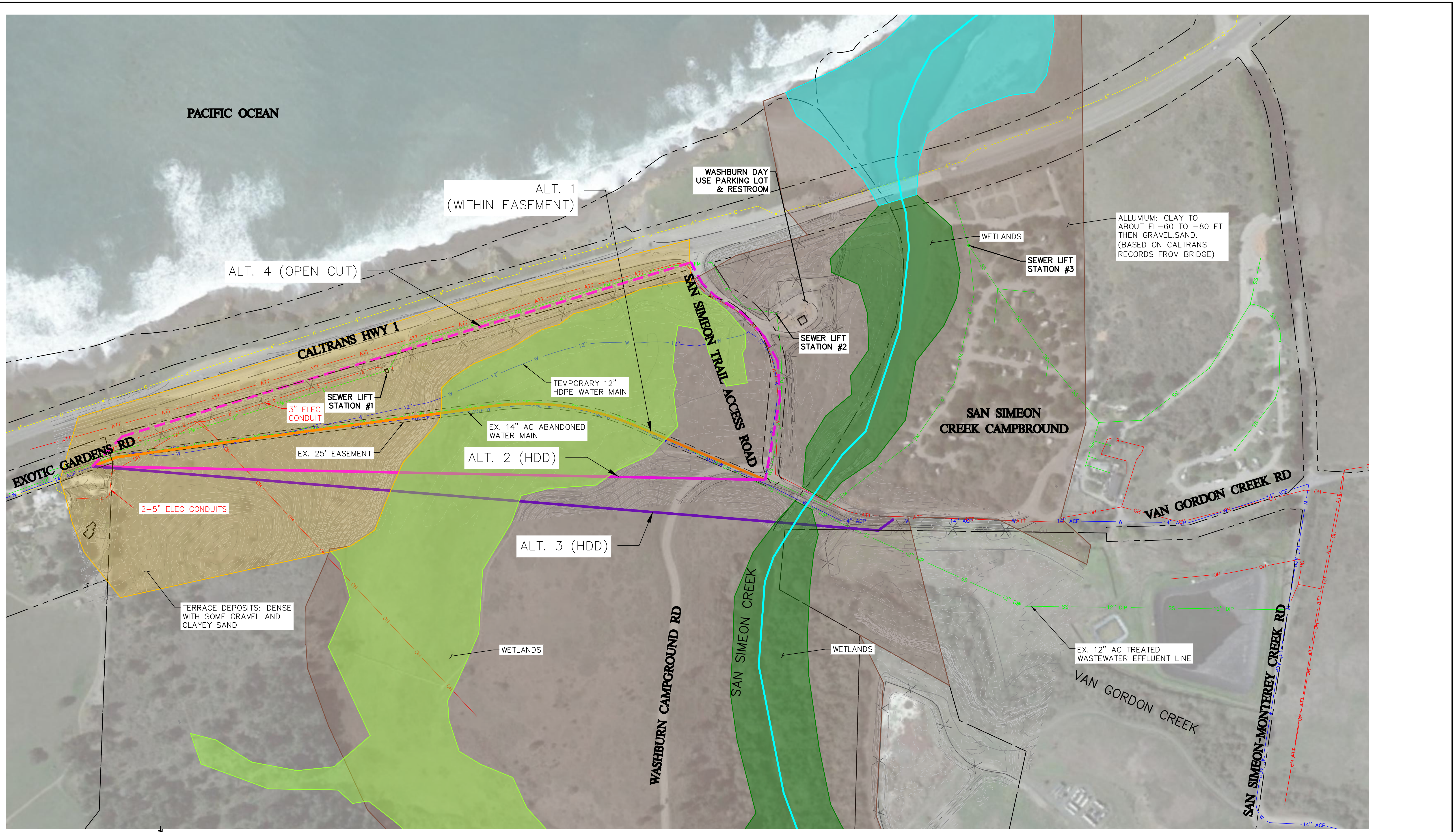
Alternative Alignment 3 begins at the north end of Exotic Gardens Drive near the dead end of the road just east of Highway 1. The alignment then follows a straight route, east of the CCSD's existing 25' wide easement, under the protected wetlands on California State Parks property. The alignment extends past the wetlands and ends approximately 400 feet northeast of the intersection of Washburn Campground Road & San Simeon Trail Access Road within CCSD property about 300' north of the pedestrian bridge (south of the percolation ponds). The total length of Alternative Alignment 3 is approximately 2,800 feet. Due to the environmental sensitivity of the wetlands area, trenching is not considered a feasible construction method. HDD would be the construction method considered. A new 25' wide utility and access easement would be required for this alignment.

2.5 Alternative 4 – Trenching Along Highway 1

Alternative Alignment 4 begins at the north end of Exotic Gardens Drive, near the dead end of the road, just east of Highway (Hwy) 1. The alignment then extends approximately 140' west into the east side of the Caltrans Hwy 1 right-of-way. The alignment then runs within and along the east edge of the Caltrans right-of-way approximately 2,100' north to the San Simeon Trail Access Road. The alignment then turns east and runs along the San Simeon Trail Access Road to its intersection with Washburn Campground Road. The alignment ends near this intersection about 100' south of the pedestrian bridge on

Washburn Campground Road. The total length of Alternative Alignment 4 is approximately 3,100 feet. This is the only alignment to circumnavigate and completely avoid the protected wetlands on California State Parks property. Trenching is the proposed construction method for this alignment. Due to the size of the water and wastewater pipelines and separation requirements, it is expected that two separate trenches will be required for this alternative with a minimum separation of approximately 6 feet centerline to centerline.

Figure 2-1: Alignment Alternatives 1 Through 4



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LEGEND

--- : PARCEL BOUNDARY (APPROX.)	OH --- : EX. OVERHEAD WIRE	--- : PROPOSED ALT. 1	--- : WETLANDS
--- : EASEMENT BOUNDARY (APPROX.)	G --- : EX. GAS	--- : PROPOSED ALT. 2	--- : WATER
ATT --- : EX. AT&T CONDUIT	SS --- : EX. SEWER PIPE	--- : PROPOSED ALT. 3	--- : TERRACE DEPOSITS
E --- : EX. ELECTRICAL UTILITIES	W --- : EX. WATER TRANS. MAIN	--- : PROPOSED ALT. 4	--- : ALLUVIUM

1 INCH = 150 FEET

REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CKD. BY	APRD. BY

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**CAMBRIA COMMUNITY SERVICES DISTRICT
WATER AND WASTEWATER PIPELINE REPLACEMENT PROJECT**

ALIGNMENT ALTERNATIVES
CAMBRIA, CALIFORNIA

DRAWN BY FC	DATE 11/30/2023	CA JOB NO. 230311
CHECKED BY	SCALE 1" = 150'	SHEET 1 OF 2

3. RIGHT-OF-WAY AND UTILITIES

3.1 Existing Right-of-Way

Existing roads within the Project limits either fall within public right-of-way (ROW), or are quasi-public State Parks roadways or private roads. Existing roads are improved to varying degrees. Characteristics of the existing roads within the Project limits are summarized in the table below.

Table 3-1. Existing Road Characteristics

Road Name	Ownership	ROW Width (feet)	Improvements
Cabrillo Hwy (Hwy 1)	Caltrans, Public ROW	176	AC Pavement
Exotic Garden Drive	SLO County, Public ROW	60	AC Pavement
San Simeon Creek Road	SLO County, Public ROW	60 and 30	AC Pavement
San Simeon Trail Access Road	SLO County, Public ROW	60	AC / Dirt
Van Gordon Creek Road	SLO County, Public ROW	50	AC Pavement
San Simeon Campground Road	State Parks Roadway	NA	AC Pavement
Washburn Campground Road	State Parks Roadway	NA	AC Pavement

Notes: Italics indicate ROW ownership and width to be verified during final design phase.

3.2 Existing Easements

The only relevant utility easement through the Project limits is the CCSD 25' wide by 2,300 feet long utility and access easement that follows a curved route across California State Parks property and protected wetlands. As previously mentioned, a new 25' wide utility and access easement would be required for Alternative Alignments 2 and 3. No easements are required for Alternatives 1 and 4.

3.3 Existing Utilities

Existing utilities are an important consideration when evaluating various alignment alternatives. The location and size of an existing utility line may create a major obstruction to a particular alignment, require relocation, impact construction cost, and determine alignment feasibility. Existing underground utilities within the Project limits are summarized as following:

- CCSD 14" water transmission main
- CCSD 12" temporary water transmission main
- CCSD 12" wastewater effluent pipeline
- SoCal Gas 2" and 4" gas lines
- PG&E two (2) to four (4) electrical conduits from 2" to 5" diameter
- ATT three (3) cable/fiber-optic lines of unknown size
- State Parks 2", 3" and 4" sewer force mains

In general, existing underground utilities do not pose an obstacle to Alternative Alignments 1, 2 and 3. Existing utilities do pose a moderate obstacle to Alternative Alignment 4. There are a few overhead utility lines within the Project limits. However, the overhead utilities do not pose an obstruction, and do not impact the feasibility of the alternatives.

3.3.1 Water and Sewer

Within the Project area, the existing CCSD 14" diameter potable water transmission main extends from the CCSD's well field west down San Simeon Creek Road to Van Gordon Creek Road where it turns south

down Van Gordon Creek Road. Van Gordon Creek Road ties into Washburn Campground Road, and the 14" water transmission main continues south in Washburn Campground Road to the north end of the CCSD 25' wide easement. The 14" water transmission main runs south approximately 2,300' within the CCSD easement (through protected wetlands) to the north end of Exotic Gardens Road where it continues south in Exotic Gardens Road out of the Project area. The CCSD 14" water transmission main failed at approximately the midpoint of the 2,300' CCSD easement.

The CCSD 12" temporary water transmission main is routed around the location where the 14" water transmission main failed, and runs from the Van Gordon Creek Road-Washburn Campground Road intersection, west about 500' in the San Simeon Trail Access Road, then turns south and runs for approximately 2,000' before it ties back into the existing CCSD easement, and then continues approximately 1,000' within the CCSD easement to the north end of Exotic Gardens Road where it continues south in Exotic Gardens Road out of the Project area.

Within the Project area, the CCSD 12" wastewater effluent pipeline extends from Exotic Gardens Road north approximately 2,300' within the CCSD easement (through protected wetlands) into Washburn Campground Road. Washburn Campground Road ties into Van Gordon Creek Road, and the 12" wastewater effluent pipeline continues north in Van Gordon Creek Road approximately 100' then veers northeasterly into the CCSD percolation pond property, and continues approximately 1,500' to San Simeon Creek Road (out of the Project area).

3.3.2 Gas

Through the entire Project limits, the PG&E 4" gas line runs along the west side of Hwy 1 between the west edge of pavement and right-of-way line. The 4" gas line in the Hwy 1 right-of-way is also attached to the west side of the Hwy 1 bridge over San Simeon Creek. There is also an existing 2" gas line in Exotic Gardens Road that comes from the south and appears to terminate approximately 300' south of the north end of Exotic Gardens Road and outside the project area. There are no other existing gas lines within the Project limits. The gas lines do not significantly obstruct any of the alignment alternatives.

3.3.3 Electric

Within the Project area, there are two to four existing underground electric conduits along the east side of Exotic Gardens Road which at the north end of Exotic Gardens Road jog over to a vault on the east side of the Hwy 1 right-of-way. The electric conduits then run along the east side of the Hwy 1 right-of-way for approximately 1,100' where they end at State Parks Sewer Lift Station#1. Although a significant portion of this alignment appears to run within State Parks property just outside the Caltrans (Hwy 1) right-of-way, these facilities may pose a minor obstruction to all alignment alternatives at the north end of Exotic Gardens Road. The conduits range in size from 2" to 5" diameter. There are also some existing underground electric conduits within the State Park San Simeon Creek Campground that do not obstruct any of the alignment alternatives. There are no other existing underground electric conduits within the Project limits.

3.3.4 Telephone & Communications

Beginning south of the Project area, three (3) existing ATT telephone/communications cables/conduits run along the Hwy 1 right-of-way at various locations including between the east edge of pavement and right-of-way line. These cables/conduits continue north to the San Simeon Trail Access Road where they turn east and run in the San Simeon Trail Access Road to a manhole at the intersection of Washburn Campground Road. One ATT conduit then turn north and runs in Washburn Campground Road/Van Gordon Creek Road for approximately 1,000' into the Simeon Creek Campground area where it then becomes an overhead line. The size of cables/conduits is unknown at this time.

Direct TV, Spectrum, T-Mobile and Viasat provide cell phone, internet, satellite TV/internet and wireless services in the Project area. However, they do not appear to have underground facilities within the Project area. There do not appear to be any other existing underground cable or communication conduits within the Project limits.

3.3.5 State Parks Sewer (Private Utilities)

Within the Project area the only private underground utility identified is the sewer system owned and operated by State Parks. The State Parks sewer system consists of 6" diameter gravity sewer lines, manholes, three(3) sewer lift stations, and three (3) sewer force mains. The 6" gravity sewer lines and manholes are limited to within the campgrounds and do not impact any of the alternative alignments.

Sewer Lift Station #1 is located just east of Caltrans right-of-way in State Parks property approximately 1,000' north of Exotic Gardens Road. Force Main #1 is 2" diameter, runs south from Lift Station #1 along the west side of Exotic Gardens Road, and ultimately discharges into a CCSD manhole in Moonstone Drive. Sewer Lift Station #2 is located near the Washburn Day Use parking lot and restroom off the San Simeon Trail Access Road. Force Main #2 is 4" diameter and runs south from Lift Station #2 to Lift Station #1 along the east side of the Caltrans right-of-way. Sewer Lift Station #3 is located east of Hwy 1 within the San Simeon Creek Campground. Force Main #3 is 3" diameter and runs through the campground, across the Washburn Campground Road pedestrian bridge, through the intersection of Washburn Campground Road & San Simeon Trail Access Road, and down the San Simeon Trail Access Road to Lift Station #2.

The State Parks sewer system does not pose an obstruction to Alignment Alternative3. Force Main #3 does pose a minor obstruction to Alignment Alternatives 1 and 2 at the intersection of Washburn Campground Road & San Simeon Trail Access Road. Sewer Lift Station #1 and Force Main #1 appear to be outside the Caltrans right-of-way and will likely not pose significant obstructions to Alignment Alternative 4. However, much of Force Main #2 is located within the Caltrans right-of-way between the east edge of pavement and easterly right-of-way line, and may pose a significant obstruction to Alignment Alternative 4. Additional research is needed to determine the exact location of Force Main #2 and whether or not it will pose an obstruction to Alignment Alternative 4. There do not appear to be any other existing underground private utilities within the Project limits.

3.3.6 Storm Drain

There do not appear to be any existing storm drain pipes within the Project limits.

3.3.7 Existing Utilities Summary

Table 3-2 presents a summary of the existing underground utilities within the Project limits.

Table 3-2. Existing Underground Utilities within Project Limits

Utility Type	Utility Owner	Present (Yes/No)	Extent	Alt 1 Conflict (Yes/No)	Alt 2 Conflict (Yes/No)	Alt 3 Conflict (Yes/No)	Alt 4 Conflict (Yes/No)
Water	CCSD	Yes	Entire Project Limits	No	No	No	No
WW Effluent	CCSD	Yes	Entire Project Limits	No	No	No	No
Sewer Force Mains	State Parks	Yes	Entire Project Limits	Yes Minor	Yes Minor	No	Yes
Sewer Lift Stations	State Parks	Yes	Limited	No	No	No	Maybe
Gas	SoCal Gas	Yes	Lengthy	No	No	No	No
Electric	PG&E	Yes	Limited	Maybe	Maybe	Maybe	Maybe
Telephone & Comm.	ATT	Yes	Entire Project Limits	Yes Minor	Yes Minor	No	Yes
Cable TV & Comm.	Direct TV, Spectrum, T-Mobile & Viasat	Yes	Entire Project Limits	No	No	No	No
Storm Drain	SLO County	No	NA	No	No	No	No

Notes: An affirmative conflict indicates potential significant additional cost for the proposed pipelines, or that the existing utility must be relocated.

4. ENVIRONMENTAL OVERVIEW

4.1 SWCA Environmental Consultants

SWCA Environmental Consultants (SWCA) is a 100% employee-owned S-Corporation (California Department of Industrial Relations [DIR] #1000017804) established in 1981 and incorporated in 1984. They provide a full spectrum of environmental services focused on planning, natural and cultural resource management, permitting, regulatory compliance, and geographic information systems (GIS) consulting. SWCA's experienced staff provide clients with California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) document preparation; natural and cultural resources surveys, management, and compliance; paleontological resources management; Clean Water Act Section 404 and stormwater permitting; environmental compliance monitoring; and other services, including Computer Aided Design (CAD) and GIS services, facilitation and public involvement, and technical editing. SWCA currently provides similar waterline-related services to the County of San Luis Obispo, City of Paso Robles, City of Morro Bay, City of Pismo Beach, Nipomo Community Services District, San Miguel Community Services District, and Golden State Water Company, among others.

4.2 Environmental Overview Technical Memo

Please see Appendix A. SWCA has prepared the attached Technical Memo to provide an overview of the environmental constraints with emphasis on existing sensitive biological and cultural resources as well as anticipated permitting triggers for the subject San Simeon Water & Wastewater Pipeline Replacement Project. The Technical Memo includes the following sections: Environmental Considerations and Constraints, CEQA Options Analysis, Project Environmental Permitting, and Conclusions.

5. ADDITIONAL PERMITTING

5.1 Water Resources-Water Quality Permits

As indicated in Appendix A – Environmental Overview Technical Memo, depending on the alignment alternative and construction method selected, a few different water resources-water quality related permits may be required for the proposed Project. CCSD should anticipate the possible need to process permits with USACE, CDF&W and RWQCB. The proposed Project is expected to have well under one acre of disturbance. Therefore, it is anticipated that a stormwater Construction General Permit will not be required. However, due to the sensitivity of the Project area, it is recommended that the construction specifications require the contractor to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP).

5.2 Caltrans

A Caltrans Encroachment Permit is only required with Alignment Alternative 4 routed through the Caltrans Hwy 1 right-of-way. In certain locations, Caltrans has a history of denying encroachment permits to public utilities. However, other utilities already exist within the Caltrans Hwy 1 right-of-way such as a PG&E gas line and ATT cables. If Alignment Alternative 4 is selected, CCSD should anticipate the need for CCSD executives to deal directly with Caltrans District 5 management to obtain an encroachment permit.

5.3 County of San Luis Obispo

The County of San Luis Obispo Public Works Department requires an Encroachment Permit for any construction within the public right-of-way within unincorporated areas of the County. All alignment alternatives start within the public right-of-way of Exotic Gardens Road. Alignment Alternative 1, 2 and 3 may end within the public right-of-way of Van Gordon Creek Road. (Washburn Campground Road is an access road within San Simeon State Park and not public right-of-way.) And Alignment Alternative 4 is routed within the public right-of-way of the San Simeon Trail Access Road. Therefore, a San Luis Obispo County Encroachment Permit will be required for the proposed Project.

Although the County does not appear to have a pavement moratorium, the District should anticipate fairly substantial pavement restoration permit requirements. At a minimum, the Encroachment Permit will require that the pavement be restored to pre-existing or better condition. Potentially, this may include milling and overlaying a full 12' lane width over the proposed pipelines wherever they run within the paved roadway. Also, in paved areas, trench backfill with one-sack slurry will be required. The final pavement restoration requirements will be determined at the time the District applies for the Encroachment Permit and based on the final pipeline plans.

5.4 Permitting Summary

Table 5-1 provides a preliminary summary of jurisdictional/permitting agencies, and associated permits.

Table 3-1. Preliminary Permitting Summary

Jurisdictional Agency	Permit Type	Processing Duration (months)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
USACE	Section 404 Clean Water Act Permit	6 - 8	May be required	May be required	May be required	Likely not required
CDF&W	Section 1602 Streambed Alteration Permit	4 - 6	May be required	May be required	May be required	NA
RWQCB	Section 401 Water Quality Certification	6 - 8	May be required	May be required	May be required	Likely not required
Caltrans	Encroachment Permit	4 - 6	NA	NA	NA	Required
State Parks	Right of Entry	4 - 6	No	May be required	May be required	NA
State Parks	Easement	4 - 6	No	Yes	Yes	No
SLO County	Encroachment Permit	3 - 4	Required	Required	Required	Required
SLO County (Coastal Commission)	Coastal Development Permit	8 - 12	May be required	May be required	May be required	Likely not required

Notes: .

6. GEOTECHNICAL OVERVIEW

6.1 Yeh and Associates

Yeh and Associates is a consulting firm specializing in providing high quality geotechnical engineering and engineering geology services throughout western United States. Their California offices are led by a team of local geotechnical experts that have been practicing geotechnical services and supporting public agency clients with infrastructure projects for nearly 30 years. Yeh's staff has extensive experience working on water projects throughout the central coast of California that typically include structures and pipelines that traverse varied subsurface conditions where geotechnical characteristics, such as soft ground, liquefaction, shallow groundwater, bedrock, and poor soil conditions, may increase the complexity of the project. Their staff is familiar with addressing those conditions and providing effective design solutions. They are experienced preparing Geotechnical and Geologic Hazard Reports and Baseline Geotechnical Reports to address requirements of the California Building Code and AWWA standards for pipeline projects.

6.2 Geotechnical Overview Technical Memo

Please see Appendix B. Yeh and Associates attached Technical Memo summarizes the existing conditions at the site, and realignment/replacement alternatives for the subject San Simeon Water & Wastewater Pipeline Replacement Project. The Technical Memo includes the following sections: Existing Site Conditions, Proposed Alternatives, Geologic Setting, Subsurface Conditions, Geotechnical Considerations, and Preferred Alternative.

7. CONSTRUCTION METHODS

7.1 Open Cut Trench Excavation

Open cut trench excavation is a construction method used to install (or replace) underground utilities such as pipelines, conduits, and cables. Pipelines installed by this method typically range in depth from 2 to 10 feet but can be as much as 25 feet deep or more. However, open trench excavations greater than 25 feet deep are uncommon. The length of pipe installed by this method is unlimited.

Pipeline installation (or replacement) by the open cut trench excavation method involves utilizing heavy digging equipment, such as a backhoe or excavator, to excavate a trench down to a specified depth, laying the pipe within the trench, and backfilling the trench to cover the pipe. Often this type of work is performed within the paved roadway in which case the pavement must be sawcut and removed first. As an important safety measure, trenches greater than 4 feet deep require shoring of the trench walls to prevent collapse of the trench during construction. Typically, select material such as sand is used as pipe bedding at the bottom of the trench and surrounding the pipe. Under certain circumstances the pipe may be concrete encased. The trench is backfilled and compacted in lifts, and the ground surface or pavement restored to its original condition.

Where an existing pipeline is being replaced, it is typically required to keep the existing pipe in service while the new replacement pipe is being installed. Therefore, the replacement pipe is commonly installed parallel and adjacent to the existing pipe. Once the replacement pipe is in place, a shutdown and tie-over/cut-in connection procedure is completed, the replacement pipe is placed into service, and the old pipe is abandoned in place.

Open cut trench excavation across the wetlands for the San Simeon Water and Wastewater Pipeline Replacement Project is considered infeasible due to the level of environmental impact caused. However, open cut trench excavation for pipeline replacement along Hwy 1 is considered technically and environmentally feasible. Due to the size of the water and wastewater pipelines and separation requirements, it is expected that two separate trenches will be required for pipeline replacement along Hwy 1 with a minimum separation of approximately 6 feet centerline to centerline.

7.2 Horizontal Directional Drilling

Horizontal directional drilling (HDD) is a trenchless construction method used to install (or replace) underground pipelines, conduits, and cables in a relatively shallow arc or radius along a prescribed underground path using a surface-launched drilling rig. HDD provides a significant environmental advantage over traditional open cut trench installations. This method is routinely used when conventional trenching is not practical, or when minimal surface disturbance is required. Horizontal Directional Drilling involves the use of a directional drilling machine, and associated attachments, to accurately drill along the chosen bore path and back ream the required pipe. The HDD process involves three stages: 1) pilot hole, 2) pre-reaming, and 3) pipe pullback.

Pilot Hole. The first stage consists of drilling a small diameter pilot hole. Drilling fluid is pumped through the drill pipe to the drill bit where high pressure jets and the bit will grind the soils ahead of the drill stem. The drilling fluid will also carry the cuttings back to the entrance pit at the drill rig. For smaller shots, tracking of the pilot hole is done using a walkover guidance system. For larger more complex shots, tracking of the pilot hole is accomplished using a wire line magnetics type system. With both methods there is a transmitter or steering tool located near the drill head which sends a signal to the location engineer giving the exact coordinates of the drill stem. Readings are constantly taken which check the depth, alignment and percent slope of the drill head. Corrections are made by the operator

and locator to keep the pilot hole along the predetermined bore path. The speed at which the pilot hole advances will vary based on existing soil conditions and the amount of steering required. Upon reaching the exit point, the beacon housing and bit are detached, and replaced with a reamer.

Pre-Reaming. The second step is to pre-ream the pilot hole and enlarge it to a size sufficient to safely install the new pipeline. A reamer is pulled back and rotated (while pumping drilling fluid) to cut and remove solids to enlarge the hole. Pre-reaming speeds will vary based on existing soil conditions, and the amount of cuttings that are removed from the hole. Bentonite drilling fluid and other additives will be used to ensure a clean and stable hole. Bentonite is used to create a “cake layer” around the outside of the hole during pre-reaming. This helps stabilize the bore hole and reduce fluid loss or infiltration. Additives, such as polymers, may be used to help break up clay soils, and mitigate blockages inside the bore hole.

Pipe Pullback. The final step is the pullback of the new pipeline within the pre-reamed hole. The drill rod and reamer will be attached to a swivel, which is utilized between the pipeline and the reamer to prevent any torsional stress from the rotating drill string being transferred to the pipeline. As the pipeline is pulled into the drill hole, drilling fluid is pumped downhole to provide lubrication to the pipeline.

Pipeline installed by this method typically range in diameter from 1 to 24 inches, although larger diameter pipeline projects have been completed. This construction method is commonly used to cross under rivers and other large obstructions. Therefore, installations are typically deep and can be as much as several hundred feet deep depending on the length of installation. The record HDD installation is over 15,000 feet under Lake Sakakawea on the Missouri River in North Dakota.

Determining the entry and exit points, and the depth that must be achieved are important considerations when planning an HDD project and evaluating the construction feasibility. Two critical calculations are the bend radius of the drill rod and the bend radius of the product pipe. Bend radius is defined as the forward distance required for a drill string to make a 90-degree turn. A common industry standard for determining the minimum design radius of curvature for welded steel pipe in an HDD installation is to multiply the nominal diameter of the pipe in inches by 100 to determine the allowable radius in feet. For a 14” diameter pipe this would result in a minimum bend radius of approximately 1,400 feet. Other pipe materials used in HDD, such as HDPE and fusible PVC, have a much smaller minimum design radius of curvature. Drill stems for small or mid-sized drill rigs commonly have bending radii less than 200 feet. Therefore, the bend radius of the product pipe will govern, and if steel pipe can achieve the required design radius, than other materials will as well. Entry angles are normally specified to be between 8-20 degrees, with 12 degrees being ideal, while exit angles are usually between 5-12 degrees with 10 degrees being ideal.

For the San Simeon Water and Wastewater Pipeline Replacement Project horizontal directional drilling appears to be technically and environmentally feasible. The length of pipeline installation and necessary design radius are well within the capabilities of HDD. Also, the entry and exist points of the HDD pipeline installation can be located within existing public right-of-way or CCSD property, and outside of the wetlands area.

7.3 Pipe Lining

Cured-in-place pipe (CIPP) lining is a trenchless pipe replacement construction method used to rehabilitate existing pipes such as sanitary sewers, storm drains, and waterlines. The pipe being lined must be removed from service during the installation process. For sewer lines, bypass pumping of sewer flows is necessary. Before lining, the pipe is cleaned, and video inspected. Local repairs may be

required to badly deformed or damaged sections of existing pipe. CIPP liners of non-woven polyester felt, or fiber reinforced fabric are custom manufactured to fit the host pipe. Liners are impregnated with a polymer resin, which when cured will form a close fitting liner pipe within the host pipe. The CIPP liner can have sufficient thickness when cured to sustain the loads imposed on the pipe by groundwater, internal service pressure, soil loads, and traffic loads. The liner is thoroughly saturated with polyester, vinyl ester epoxy or silicate resin using vacuum, gravity or other applied pressure. The resin includes a chemical catalyst or hardener to facilitate curing. The outermost layer of the liner tube is coated with a polymer film to protect the liner during handling and installation.

CIPP liners are typically installed using the inversion method. The inversion method employs a scaffold tower to apply water pressure to turn the liner inside out and push it into and along the host pipe. CIPP liners may be inverted with air or water pressure. Liner lengths may vary from short sections over a joint or defect, to common lengths of 300 to 600 feet. The record single section of CIPP liner is around 2,500 feet. Curing time is reduced through heating the internal air or water. Once the pipe cures, the curing water or steam condensate is removed, and the ends of the liner are trimmed flush with the pipe ends, and sealed. Where applicable, when the lining is complete, the service connections are reinstated and the pipe is returned to service, typically on the same day.

For the San Simeon Water and Wastewater Pipeline Replacement Project CIPP lining appears to be feasible. However, the 2,300 feet length of existing water and wastewater pipelines is very close to the maximum length of the CIPP technology. Therefore, relatively high risk is associated with use of CIPP lining to replace the existing 14" diameter potable water transmission main and 12" diameter wastewater effluent pipeline. Other pipe lining methods such as sliplining and internal pipe coating are not considered feasible for the San Simeon Water and Wastewater Pipeline Replacement Project either due to installation limitations of the technology or inability to address the existing problems.

7.4 Pipe Bursting

Pipe bursting is a trenchless pipe replacement construction method by which an existing pipe is split open and forced outward by an internal bursting tool. A cone shaped hydraulic or pneumatic expansion head, which is part of the bursting tool, is pulled through the existing pipeline, typically by using a chain or cable and winch. As the expansion head is pulled through the existing pipe, it pushes the pipe radially outward until it breaks apart, creating a space for the new pipe. The bursting tool also pulls the new pipeline behind it, immediately filling the void created by the old, burst pipe with the new pipe. Pipe bursting can be used to replace existing pipe with same sized pipe, or larger pipe. Pipe bursting is typically used on runs of 300 to 600 feet, although runs of 1,000 feet or more are also common. The record pipe bursting run is 2,800 feet. However, runs over 1,000 feet involve high risk of potential failure.

The San Simeon Water and Wastewater Pipeline Replacement Project includes several challenges associated with pipe bursting. Repair couplings located along the length of the pipelines would be a problem to burst. Typically, such locations are identified, and open pit excavations are used to expose and remove the repair couplings. Due to the shallow depth of the existing pipelines, the excavation pits for the pipe bursting equipment will need to be 25 feet long or more, and 10 feet deep or more for the rig to get the necessary bearing area to pull against the existing soil. In addition, the soil is expected to be soft making it even more difficult to secure the equipment in place to pull the new pipe through. Also, there is a 300 feet section of ductile iron pipe (DIP) on the wastewater line that will be difficult to burst, and going up the steep hill will be problematic. For the San Simeon Water and Wastewater Pipeline Replacement Project, the maximum recommended pipe bursting runs are 700 to 800 feet. This would require a total of four pits with two intermediate pits located in the middle of the wetlands. Construction equipment would have to be running back and forth across the wetlands area.

As a result of all these challenges, a pipe bursting operation would have a similar impact to the wetlands as open cut trenching pipeline replacement. Therefore, pipe bursting is considered infeasible for this Project and is dropped from further consideration.

8. ADDITIONAL CONSIDERATIONS

8.1 Constructability

The Construction Industry Institute (CII) defines “constructability” as the optimal use of construction knowledge and experience in planning, design, procurement, and field operations to achieve overall project objectives. In the context of the San Simeon Water & Wastewater Pipeline Replacement Project, constructability (or buildability) is the measure of ease, efficiency, economy, and eco-friendliness with which the water and wastewater pipelines can be replaced. Factors determining project constructability include items such as available contractors, available equipment, available materials, construction methodology, accessibility, permit conditions, and opportunity for construction innovation.

All alignment alternatives are buildable. However, Alignment Alternatives 2 and 3 appear to have the highest constructability utilizing horizontal directional drilling. Alignment Alternative 4 utilizing open cut trenching has a moderate to high constructability. Alignment Alternative 1 appears to have moderate to low constructability.

8.2 Construction Risk

Construction sites tend to be considerably different from other workplaces, such as offices or retail locations. They have a unique set of risks, which other industries might not even have to consider. The injury rate also happens to be higher in the construction industry compared to any other industry. Construction risk considers the type and size of potential hazards pertaining to a civil construction project. A construction risk assessment aims to identify dangerous factors in construction projects. A risk is a chance that a hazard will cause someone injury, illness, harm or other damage.

The construction risk assessment at this early/preliminary point in the Project planning is intended to raise awareness of potential significant risks and hazards, and estimate how significant or severe a potential risk might be. The more significant construction risks identified include the following: equipment failure, environmental mishap, traffic hazard, and trench failure. Table 8-1 below provides a preliminary overview of construction risk associated with each alignment alternative and construction method.

Table 3-1. Construction Risk Preliminary Overview

Alignment Alternative	Equipment Failure	Environmental Mishap	Traffic Hazard	Trench Failure	Overall Construction Risk
1-CIPP	High	Medium	Low	Low	Medium-High
1-HDD	Medium	Medium	Low	Low	Medium
2	Low	Medium	Low	Low	Low-Medium
3	Low	Medium	Low	Low	Low-Medium
4	Low	Low	High	Medium	Medium

Notes: .

8.3 Operations & Maintenance

Often various project alternatives will have different ongoing long-term operations and maintenance requirements. For the San Simeon Water and Wastewater Pipeline Replacement Project the routine maintenance is expected to be approximately the same for all alignment alternatives. However, if steel or ductile iron pipe (DIP) is used, then a cathodic protection system is recommended and will require more regular maintenance than alternatives utilizing CIPP, HDPE, or PVC pipe. Also, Alignment Alternatives 1-CIPP and 4 result in relatively shallow installations that may be more vulnerable to future storm and tidal damage than the much deeper HDD alternatives. Finally, the life expectancy of the alignment alternatives will be dependent upon the pipe material utilized as indicated below.

- CIPP 40-60 years
- DIP w/ cathodic protection 60-80 years
- Steel w/ cathodic protection 70-90 years
- PVC 100 + years
- HDPE 100 + years

9. ESTIMATED CONSTRUCTION COSTS

9.1 Alternatives 1-CIPP and 1-HDD

The engineer's preliminary construction cost estimate includes the construction cost plus a 25% contingency. The preliminary construction cost estimate for Alignment Alternatives 1-CIPP and 1-HDD are provided below.

Table 3-1. Alternative 1-CIPP Preliminary Construction Cost Estimate

Bid Item	Description	Qty.	Unit	Unit Price	Extend Price
1	Mobilization	1	LS	\$ 95,000	\$ 95,000
2	SWPPP	1	LS	\$ 30,000	\$ 30,000
3	Traffic Control	1	LS	\$ 10,000	\$ 10,000
4	Construction Staking	1	LS	\$ 5,000	\$ 5,000
5	Environmental Monitoring	1	LS	\$ 30,000	\$ 30,000
6	Pothole Existing Utilities	6	EA	\$ 1,500	\$ 9,000
7	Installation Pit Excavation (12'x6'x6' x two)	30	CY	\$ 150	\$ 4,500
8	Receiving Pit Excavation (12'x6'x6' x two)	30	CY	\$ 150	\$ 4,500
9	Install 14" CIPP Waterline	2,400	LF	\$ 360	\$ 864,000
10	Install 14" Gate Valve	2	EA	\$ 9,000	\$ 18,000
11	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
12	Install 14" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 10,000	\$ 10,000
13	Install 14" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 10,000	\$ 10,000
14	Install 12" CIPP Wastewater Effluent Pipe	2,400	LF	\$ 330	\$ 792,000
15	Install 12" Gate Valve	2	EA	\$ 7,000	\$ 14,000
16	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
17	Install 12" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 9,000	\$ 9,000
18	Install 12" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 9,000	\$ 9,000
19	Abandon Existing Pipeline in Place	2	EA	\$ 1,500	\$ 3,000
20	Install 1-Sack Slurry Trench Backfill	36	CY	\$ 200	\$ 7,200
21	Construct 4" AC Pavement	11	Tons	\$ 500	\$ 5,500
22	Remove Temporary 12" Waterline	1	LS	\$ 8,000	\$ 8,000
23	Perform Site Restoration	1	LS	\$ 20,000	\$ 20,000
Total					\$ 1,989,700
Contingency				25%	\$ 497,425
Construction Grand Total (rounded)					\$ 2,488,000

Table 3-2. Alternative 1-HDD Preliminary Construction Cost Estimate

Bid Item	Description	Qty.	Unit	Unit Price	Extend Price
1	Mobilization	1	LS	\$ 55,000	\$ 55,000
2	SWPPP	1	LS	\$ 30,000	\$ 30,000
3	Traffic Control	1	LS	\$ 10,000	\$ 10,000
4	Construction Staking	1	LS	\$ 5,000	\$ 5,000
5	Environmental Monitoring	1	LS	\$ 30,000	\$ 30,000
6	Pothole Existing Utilities	6	EA	\$ 1,500	\$ 9,000
7	Receiving Pit Excavation (12'x6'x6' x two)	30	CY	\$ 150	\$ 4,500
8	Install 14" Waterline (HDD)	2,400	LF	\$ 270	\$ 648,000
9	Install 14" Gate Valve	2	EA	\$ 9,000	\$ 18,000
10	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
11	Install 14" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 10,000	\$ 10,000
12	Install 14" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 10,000	\$ 10,000
13	Install 12" Wastewater Effluent Pipe (HDD)	2,400	LF	\$ 240	\$ 576,000
14	Install 12" Gate Valve	2	EA	\$ 7,000	\$ 14,000
15	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
16	Install 12" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 9,000	\$ 9,000
17	Install 12" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 9,000	\$ 9,000
18	Abandon Existing Pipeline in Place	2	EA	\$ 1,500	\$ 3,000
19	Install 1-Sack Slurry Trench Backfill	18	CY	\$ 220	\$ 3,960
20	Construct 4" AC Pavement	6	Tons	\$ 525	\$ 3,150
21	Remove Temporary 12" Waterline	1	LS	\$ 8,000	\$ 8,000
22	Perform Site Restoration	1	LS	\$ 20,000	\$ 20,000
Total					\$ 1,507,610
Contingency				25%	\$ 376,903
Construction Grand Total (rounded)					\$ 1,885,000

9.2 Alternative 2

The engineer's preliminary construction cost estimate includes the construction cost plus a 25% contingency. The preliminary construction cost estimate for Alignment Alternative 2 with HDD is provided below.

Table 3-3. Alternative 2 Preliminary Construction Cost Estimate

Bid Item	Description	Qty.	Unit	Unit Price	Extend Price
1	Mobilization	1	LS	\$ 65,000	\$ 65,000
2	SWPPP	1	LS	\$ 30,000	\$ 30,000
3	Traffic Control	1	LS	\$ 10,000	\$ 10,000
4	Construction Staking	1	LS	\$ 5,000	\$ 5,000
5	Environmental Monitoring	1	LS	\$ 30,000	\$ 30,000
6	Pothole Existing Utilities	6	EA	\$ 1,500	\$ 9,000
7	Receiving Pit Excavation (12'x6'x6' x two)	30	CY	\$ 150	\$ 4,500
8	Install 14" Waterline (HDD)	2,350	LF	\$ 250	\$ 587,500
9	Install 14" Gate Valve	2	EA	\$ 9,000	\$ 18,000
10	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
11	Install 14" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 10,000	\$ 10,000
12	Install 14" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 10,000	\$ 10,000
13	Install 12" Wastewater Effluent Pipe (HDD)	2,350	LF	\$ 220	\$ 517,000
14	Install 12" Gate Valve	2	EA	\$ 7,000	\$ 14,000
15	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
16	Install 12" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 9,000	\$ 9,000
17	Install 12" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 9,000	\$ 9,000
18	Abandon Existing Pipeline in Place	2	EA	\$ 1,500	\$ 3,000
19	Install 1-Sack Slurry Trench Backfill	18	CY	\$ 220	\$ 3,960
20	Construct 4" AC Pavement	6	Tons	\$ 525	\$ 3,150
21	Remove Temporary 12" Waterline	1	LS	\$ 8,000	\$ 8,000
22	Perform Site Restoration	1	LS	\$ 20,000	\$ 20,000
Total					\$ 1,398,110
Contingency				25%	\$ 349,528
Construction Grand Total (rounded)					\$ 1,748,000

9.3 Alternative 3

The engineer's preliminary construction cost estimate includes the construction cost plus a 25% contingency. The preliminary construction cost estimate for Alignment Alternative 3 with HDD is provided below.

Table 3-4. Alternative 3 Preliminary Construction Cost Estimate

Bid Item	Description	Qty.	Unit	Unit Price	Extend Price
1	Mobilization	1	LS	\$ 80,000	\$ 80,000
2	SWPPP	1	LS	\$ 30,000	\$ 30,000
3	Traffic Control	1	LS	\$ 10,000	\$ 10,000
4	Construction Staking	1	LS	\$ 5,000	\$ 5,000
5	Environmental Monitoring	1	LS	\$ 30,000	\$ 30,000
6	Pothole Existing Utilities	6	EA	\$ 1,500	\$ 9,000
7	Receiving Pit Excavation (12'x6'x6' x two)	30	CY	\$ 150	\$ 4,500
8	Install 14" Waterline (HDD)	2,800	LF	\$ 260	\$ 728,000
9	Install 14" Gate Valve	2	EA	\$ 9,000	\$ 18,000
10	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
11	Install 14" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 10,000	\$ 10,000
12	Install 14" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 10,000	\$ 10,000
13	Install 12" Wastewater Effluent Pipe (HDD)	2,800	LF	\$ 230	\$ 644,000
14	Install 12" Gate Valve	2	EA	\$ 7,000	\$ 14,000
15	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
16	Install 12" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 9,000	\$ 9,000
17	Install 12" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 9,000	\$ 9,000
18	Abandon Existing Pipeline in Place	2	EA	\$ 1,500	\$ 3,000
19	Install 1-Sack Slurry Trench Backfill	32	CY	\$ 200	\$ 6,400
20	Construct 4" AC Pavement	11	Tons	\$ 500	\$ 5,500
21	Remove Temporary 12" Waterline	1	LS	\$ 8,000	\$ 8,000
22	Perform Site Restoration	1	LS	\$ 20,000	\$ 20,000
Total					\$ 1,685,400
Contingency				25%	\$ 421,350
Construction Grand Total (rounded)					\$ 2,107,000

9.4 Alternative 4

The engineer's preliminary construction cost estimate includes the construction cost plus a 25% contingency. The preliminary construction cost estimate for Alignment Alternative 4 with open cut trench is provided below. This alternative includes two separate trenches for the water and wastewater pipelines.

Table 3-5. Alternative 4 Preliminary Construction Cost Estimate

Bid Item	Description	Qty.	Unit	Unit Price	Extend Price
1	Mobilization	1	LS	\$ 105,000	\$ 105,000
2	SWPPP	1	LS	\$ 50,000	\$ 50,000
3	Traffic Control	1	LS	\$ 60,000	\$ 60,000
4	Construction Staking	1	LS	\$ 15,000	\$ 15,000
5	Environmental Monitoring	1	LS	\$ 50,000	\$ 50,000
6	Pothole Existing Utilities	15	EA	\$ 1,500	\$ 22,500
7	Install 14" Waterline (Open Cut Trench)	3,100	LF	\$ 220	\$ 682,000
8	Install 14" Gate Valve	2	EA	\$ 9,000	\$ 18,000
9	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
10	Install 14" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 10,000	\$ 10,000
11	Install 14" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 15,000	\$ 15,000
12	Install 12" Wastewater Effluent Pipe (Open Cut Trench)	3,100	LF	\$ 200	\$ 620,000
13	Install 12" Gate Valve	2	EA	\$ 7,000	\$ 14,000
14	Install 2" Combination Air Valve	2	EA	\$ 8,000	\$ 16,000
15	Install 12" Cut-In Connection (Exotic Garden Rd)	1	LS	\$ 9,000	\$ 9,000
16	Install 12" Cut-In Connection (Van Gordon Creek Rd)	1	LS	\$ 14,000	\$ 14,000
17	Abandon Existing Pipeline in Place	2	EA	\$ 1,500	\$ 3,000
18	Install 1-Sack Slurry Trench Backfill	850	CY	\$ 170	\$ 144,500
19	Construct 4" AC Pavement	180	Tons	\$ 400	\$ 72,000
20	Construct 8" AC Pavement (Caltrans R/W)	650	Tons	\$ 400	\$ 260,000
21	Remove Temporary 12" Waterline	1	LS	\$ 8,000	\$ 8,000
22	Perform Site Restoration	1	LS	\$ 40,000	\$ 40,000
Total					\$ 2,244,000
Contingency				25%	\$ 561,000
Construction Grand Total (rounded)					\$ 2,805,000

9.5 Preliminary Construction Cost Summary

The engineer's preliminary construction cost estimates for all alternatives are summarized below.

Table 3-6. Summary of Preliminary Construction Cost Estimates

Alignment Alternative	Estimated Construction Cost
Alternative 1-CIPP	\$ 2,488,000
Alternative 1-HDD	\$ 1,885,000
Alternative 2 - HDD	\$ 1,748,000
Alternative 3 - HDD	\$ 2,107,000
Alternative 4 – Open Cut Trench	\$ 2,805,000

Notes: .

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Advantages and Disadvantages

The advantages and disadvantages (or evaluation criteria) of each alignment alternative were identified. However, to facilitate an easier evaluation and comparison of the alternatives, a list of the most relevant evaluation criteria was established, and a score of 1 through 5 was assigned to each criteria for each alternative. A score of 5 is most favorable and a score of 1 is least favorable. A summary of the evaluation, including cost, is presented in Table 10-1 below.

Table 3-1. Summary of Alternatives Evaluation

Evaluation Criteria	Alternative 1-CIPP	Alternative 1-HDD	Alternative 2	Alternative 3	Alternative 4
Construction Cost	3	5	5	4	2
Environmental Impact	5	4	4	3	4
Permitting Requirements	5	4	3	3	3
Easement Required	5	5	3	3	5
Utility Conflicts	4	4	4	5	3
Public Inconvenience Due to Construction	4	4	4	5	2
Extends pipelines north of Bridge at Van Gordon Creek	2	2	2	4	2
Constructability	3	3	5	5	4
Construction Risk	2	3	4	4	3
Sustainability/Design Life ⁽¹⁾	3	5	5	5	5
Total Score:	36	39	39	41	33

Notes: 1) Design Life assumes HDPE pipe for HDD alternatives and PVC pipe for Alternative 4. .

Based on the identified evaluation criteria, Alternative 3 appears to be superior. However, Alternative 2 has the lowest capital cost. And although Alternative 1-CIPP has fewer permit requirements, and does not require a new easement, the HDD alternatives have a much longer design life than Alternative 1-CIPP.

10.2 Conclusions

The research and data gathered during preparation of the San Simeon Water & Wastewater Pipeline Replacement Project Preliminary Design Report (PDR) indicate that all four alignment alternatives are technically feasible with different implementation hurdles. The conclusions of the PDR are summarized below.

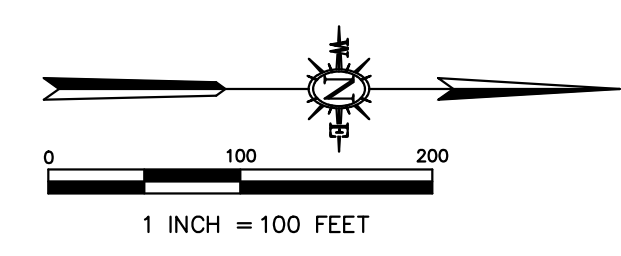
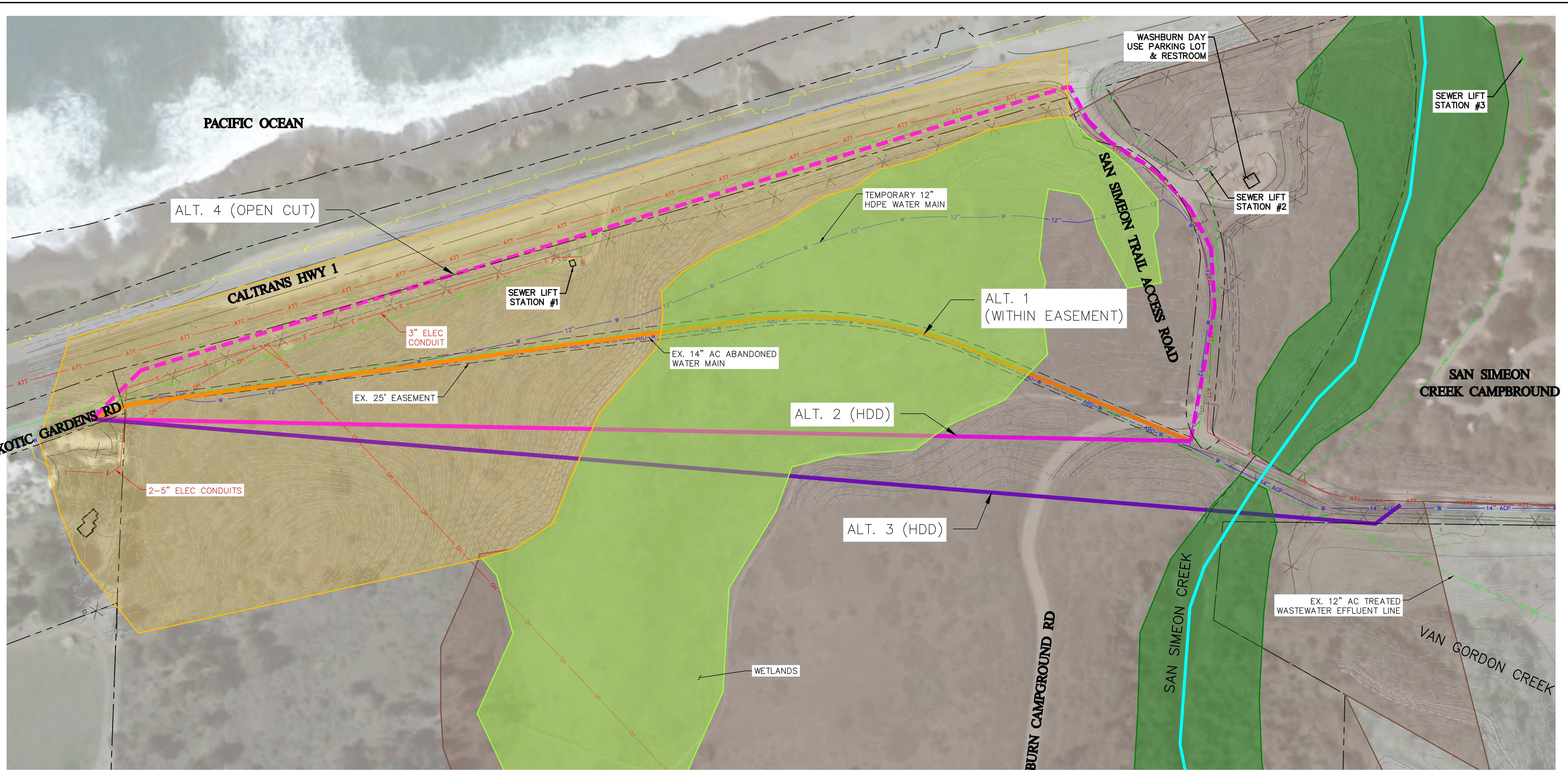
- There is sufficient existing public right-of-way to implement Alignment Alternative 4 (as well as the other alternatives).
- Alignment Alternatives 2 and 3 require acquisition of new easements from State Parks.
- There are several existing underground utilities within the proposed Project limits. Existing underground utilities pose the least constraint to implementation of Alignment Alternatives 3. Existing underground utilities pose a constraint to implementation of Alignment Alternative 4.
- Two minor cultural resource sites have been identified in the vicinity of Alignment Alternative 3.

- With implementation of appropriate mitigation measures, safeguards, and monitoring during construction, there are no significant/serious environmental issues identified for the four alignment alternatives at this time.
- Additional environmental study is required during the final engineering phase of the Project.
- Environmental (resource agency) permits will be required with yet-to-be-determined requirements depending upon the final alignment chosen.
- Additional research is needed to verify whether a Coastal Development Permit is need from the California Coastal Commission for Alignment Alternatives 1, 2 and 3.
- A Caltrans Encroachment Permit will be required with yet-to-be-determined pavement restoration requirements for Alignment Alternative 4.
- A San Luis Obispo County Encroachment Permit will be required with yet-to-be-determined pavement restoration requirements for all alignment alternatives.
- One rock outcropping has been identified that could pose a minor geotechnical constraint to Alignment Alternative 2, and two rock outcroppings have been identified that could pose a minor geotechnical constraint to Alignment Alternatives 3.
- With potential minor adjustment to the alignments, there are no significant/serious geotechnical issues identified for the four alignment alternatives at this time.
- Additional geotechnical investigation is required including design recommendations during the final engineering phase of the Project.
- In part due to favorable soil conditions, horizontal directional drilling (HDD) appears to be the most feasible construction method, and offers the least construction risk.
- Alignment Alternative 2 is the least cost alternative.

10.3 Recommended Alignment and Construction Method

Horizontal directional drilling is the recommended construction method. Based on the advantages and disadvantages identified above, Alignment Alternatives 2 and 3 appear to be the most favorable options. It is recommended that CCSD choose between these two options based on available budget and benefits of extending the replacement pipelines north of the Washburn Campground Road pedestrian bridge.

Figure 10-1: Alternative Alignments 1 Through 4



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LEGEND

- : PARCEL BOUNDARY (APPROX.)
- : EASEMENT BOUNDARY (APPROX.)
- ATT : EX. AT&T CONDUIT
- E : EX. ELECTRICAL UTILITIES
- OH : EX. OVERHEAD WIRE
- G : EX. GAS
- SS : EX. SEWER PIPE
- W : EX. WATER TRANS. MAIN
- PROPOSED ALT. 1
- PROPOSED ALT. 2
- PROPOSED ALT. 3
- PROPOSED ALT. 4
- WETLANDS
- WATER
- TERRACE DEPOSITS
- ALLUVIUM

REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CKD. BY	APRD BY

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**CAMBRIA COMMUNITY SERVICES DISTRICT
WATER AND WASTEWATER PIPELINE REPLACEMENT PROJECT**

ALIGNMENT ALTERNATIVES
CAMBRIA, CALIFORNIA

DRAWN BY FC	DATE 11/30/2023	CA JOB NO. 230311
CHECKED BY	SCALE 1" = 100'	SHEET 2 OF 2

APPENDIX A - ENVIRONMENTAL OVERVIEW TECHNICAL MEMO (SWCA ENVIRONMENTAL CONSULTANTS)

December 20, 2023

Larry Kraemer, P.E
Director, Public Infrastructure Division
Cannon
805-503-4542
LarryK@CannonCorp.us

Re: Preliminary Environmental Constraints Memorandum for the San Simeon Water and Wastewater Pipeline Replacement Project / SWCA Project No. 80757

Dear Mr. Kraemer,

Per your request, SWCA Environmental Consultants (SWCA) has prepared this memorandum (memo) to provide an overview of the environmental constraints with emphasis on existing sensitive biological and cultural resources as well as anticipated permitting triggers for the subject San Simeon Water and Wastewater Pipeline Replacement Project (project) located in the unincorporated community of Cambria, San Luis Obispo County (County), California (see Attachment A –Figure A-1: Project Vicinity and Location Map). The project is being proposed by the Cambria Community Services District (CCSD) and includes replacing the existing 14-inch diameter water transmission main and 12-inch diameter wastewater effluent pipeline via open trench and/or horizontal directional drilling (HDD). The exact alignment is yet to be determined; however, up to four alternative alignments are being proposed which will route the pipelines either through or around the protected riparian and wetland habitat located on California State Property as summarized below (see Attachment A – Figure A-2: Project Alignment Map and Attachment B – Site Plan of Alignment Alternatives).

- Alternative 1 – Within Existing 25-foot Wide Easement
- Alternative 2 – HDD to South of Washburn Campground Road Pedestrian Bridge
- Alternative 3 – HDD to North of Washburn Campground Road Pedestrian Bridge
- Alternative 4 – Trenching along the southern boundary of State Highway 1

In support of the Preliminary Design Report prepared by Cannon, SWCA staff completed a background review of relevant literature and resources pertaining to sensitive biological resources known to occur within the project area. SWCA also conducted a preliminary review of potential cultural resources that have potential to be present within the project area. The following provides an overview of potential resources and constraints associated with each of the four proposed alternatives.

ENVIRONMENTAL CONSIDERATIONS AND CONSTRAINTS

Botanical Resources

Based on a preliminary review of the California Natural Diversity Database (CNDDDB) (CDFW 2023) (see Attachment A – Figure A-3: 1.5-mile CNDDDB and Critical Habitat Map), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2023a), the California Consortium of Herbaria (CCH) online database of plant collections (CCH 2023), as well as local biological knowledge, a number of sensitive annual and botanical species have a potential to occur within the potential work areas (four alternatives) including, but not limited to:

- Monterey pine (*Pinus radiata*); California Rare Plant Rank (CRPR) 1B.1
- Hickman's onion (*Allium hickmanii*); CRPR 1B.2,
- Arroyo de la Cruz manzanita (*Arctostaphylos cruzensis*); CRPR 1B.2
- Hearst's manzanita (*Arctostaphylos hookeri* ssp. *hearstiorum*); CRPR 1B.2
- Mile's milkvetch (*Astragalus didymocarpus* var. *milesianus*); CRPR 1B.2
- San Simeon baccharis (*Baccharis plummerae* ssp. *glabrata*); CRPR 1B.2
- Dwarf goldenstar (*Bloomeria humulis*); State Rare, CRPR 1B.2.
- Cambria morning-glory (*Calystegia subacaulis* ssp. *episcopalis*); CRPR 4.2
- San Luis Obispo owl's clover (*Castilleja densiflora* ssp. *obispoensis*); CRPR 1B.2
- Maritime ceanothus (*Ceanothus maritimus*); CRPR 1B.2
- Compact cobwebby thistle (*Cirsium occidentale* var. *compactum*); CRPR 1B.2
- Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*); CRPR 1B.1
- Blochman's dudleya (*Dudleya blochmaniae*); CRPR 1B.1
- Mesa horkelia (*Horkelia cuneata* var. *puberla*); CRPR 1B.1
- Kellogg's horkelia (*Horkelia cuneata* var. *sericea*); CRPR 1B.1
- Perennial goldfields (*Lasthenia californica* ssp. *macrantha*); CRPR 1B.2
- Santa Lucia bushmallow (*Malacothamnus palmeri* var. *palmeri*); CRPR 1B.2
- Woodland woollythreads (*Monolopia gracilens*); CRPR 1B.2
- Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*); CRPR 4.2
- Monterey pine (*Pinus radiata*); California Rare Plant Rank (CRPR) 1B.1
- Twisted horsehair lichen (*Sulcaria spiralifera*); CRPR 1B.2

Based on the four alternatives and likely suitable habitat, Alternative 4 though open cut trenching, would likely be restricted to developed or previously disturbed areas that would provide only marginally suitable habitat for special-status plants. Existing conditions within Alternatives 1 – 3 likely provide suitable habitat for special-status plants with potential to occur within the project area. The typical blooming period for these species ranges between March and July. It is recommended that appropriately timed survey(s) be conducted during the typical blooming period for these species to determine presence/absence within the proposed project work area once an alternative is determined.

Wildlife Resources

Based on a preliminary review of the CNDDDB and the U.S. Fish and Wildlife Service (USFWS) Critical Habitat for Threatened and Endangered Species Report (USFWS 2023a) (see Attachment A – Figure A-2), the following sensitive wildlife species have a potential to occur within the potential work areas (four alternatives):

- Southwestern pond turtle (*Actinemys pallida*); Species of Special Concern (SSC)
- Tricolored blackbird (*Agelaius tricolor*); SSC
- Grasshopper sparrow (*Ammodramus savannarum*); SSC
- Northern harrier (*Circus hudsonius*); SSC
- Tidewater goby (*Eucyclogobius newberryi*); Federal Endangered (FE)
- Steelhead – south/central California coast DPS; Federal Threatened (FT), SSC
- California red-legged frog (*Rana draytonii*); FT, SSC
- Coast Range newt (*Taricha torosa*); SSC
- Two-striped garter snake (*Thamnophis hammondi*); SSC

Suitable habitat is present within the project area for the species listed above and several of them including southwestern pond turtle, tidewater goby, steelhead-south/central California coast DPS, and California red-legged frog are known to occur within San Simeon Creek and surrounding areas. It should be noted that USFWS Critical Habitat for California red-legged frog overlaps the proposed project area(s) and USFWS Critical Habitat for tidewater goby occurs within San Simeon Creek.

Based on the four alternatives and likely suitable habitat, Alternative 4 though open cut trenching, would likely be restricted to developed or previously disturbed areas that would provide only marginally suitable habitat for special-status wildlife species. Alternatives 1 – 3 likely provide suitable to marginally suitable habitat for special-status wildlife with potential to occur with emphasis on the California red-legged frog which may use the perennial wetland habitat areas on site for the purposes of foraging and protective cover.

Hydrological Resources

Based on a preliminary review of the USFWS National Wetlands Inventory (NWI), Wetlands Mapper (USFWS 2023b), freshwater emergent wetland habitat has been mapped within the project area east of Highway 1. In addition, a majority of San Simeon Creek is mapped as a freshwater forested/shrub

wetland with riverine and estuarine/marine influences (see Attachment A – Figure A-4: National Wetland Inventory Map).

Based on the four alternatives, Alternative 4, though open cut trenching, would likely avoid or minimize potential impacts to sensitive aquatic resources including wetland and waters habitat. Alternative 1 – 3 would likely result in direct impacts to wetland habitat areas depending on the methodology used for pipeline installation.

Cultural Resources

Compliance with CEQA and Section 106 of the National Historic Preservation Act requires that an affirmative search be undertaken to identify properties listed in, determined eligible for, or eligible for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) that may be impacted by the proposed project. SWCA conducted background research, in part, by reviewing records search data from the Central Coast Information Center (CCIC) located at the Santa Barbara Museum of Natural History. The CCIC is the regional office of the California Historical Resources Information System (CHRIS), which provides copies of prior studies and resource records in and near the project Alternatives. There are 8 previously documented prehistoric archaeological resources and one historic resource within 0.25-mile of the project Alternatives. Table 1 provides a summary of known resources.

Table 1. Previously Recorded Cultural Resources within 0.25 Mile of the Proposed Alternatives

Primary Number	Trinomial	Resource Description	NRHP/CRHR Eligibility Status	Recorded by and Year	Proximity to Project Alternatives
P-40-000072	CA-SLO-000072	Prehistoric Shell midden and lithic scatter	Unknown/ Not evaluated	1948 (Walker); 1962 (C.W. Meighan); 1966 (McKinney, Fritsche); 1967 (L. Payen); 1970 (Georgia Fleshman); 1977 (John Kelly); 2001 (Leanna Flaherty, Leroy Laurie, and Michelle Powell)	Outside
P-40-000185	CA-SLO-000185	Prehistoric Bedrock Mortar and Shell Midden	Unknown/ Not evaluated	1967 (L. Payen, State of California); 1977 (J. Kelly and Claudine Young, California Department of Parks and Recreation); 2001 (Michelle Powell, Leroy Laurie, and Leanna Flaherty, California Department of Parks and Recreation)	Outside

*Preliminary Environmental Constraints Memorandum
 San Simeon Water and Wastewater Pipeline Replacement Project / SWCA Project No. 80757*

Primary Number	Trinomial	Resource Description	NRHP/CRHR Eligibility Status	Recorded by and Year	Proximity to Project Alternatives
P-40-000186	CA-SLO-000186	Prehistoric shell midden and lithic scatter, possible habitation site	Unknown/ Not evaluated	1967 (L. Payen, State of California); 1977 (J. Kelly, C. Young, and Betty Rivers, California Department of Parks and Recreation); 2001 (Michelle Powell, Leroy Laurie, and Leanna Flaherty, California Department of Parks and Recreation)	As mapped, within 50-feet of Alt #3, within 200-feet of Alt #1, #2, and #4
P-40-000187	CA-SLO-000187	Prehistoric shell midden and lithic scatter, possible habitation site	Unknown/ Not evaluated	1967 (L. Payen, State of California); 2001 (Leroy Laurie, Leanna Flaherty, and Michelle Powell, California Department of Parks and Recreation)	Outside
P-40-000221	CA-SLO-000221/H	Multi-component prehistoric, protohistoric, and historic site.	NRHP and CRHR-eligible	1961 (Geneva Hamilton, University of California); 1965 (Riddell, University of California); 1965 (Abrams and Herst, University of California); 1977 (J.K. and C. Y., University of California); 1991 (R. O. Gibson, not listed)	Outside
P-40-000378	CA-SLO-000378	Prehistoric shell midden and lithic scatter, possible habitation site	Unknown/ Not evaluated	1961 (Geneva Hamilton, University of California)	Within Alt #3, within 200-feet of Alt #1, #2, and #4

Primary Number	Trinomial	Resource Description	NRHP/CRHR Eligibility Status	Recorded by and Year	Proximity to Project Alternatives
P-40-000383	CA-SLO-000383	Prehistoric shell midden and lithic scatter, possible habitation site	Unknown/ Not evaluated	1961 (Geneva Hamilton, SLOCAS); 1977 (J. Kelly and C. Young, California Department of Parks and Recreation); 1994 (Clay A. Singer, C. A. Singer & Associates, Inc.); 2001 (Leanna Flaherty, Leroy Laurie, and Michelle Powell, California Department of Parks and Recreation); 2001 (John Parker, California Department of Parks and Recreation)	Outside
P-40-001373	CA-SLO-001373/H	Prehistoric shell midden and lithic scatter, possible habitation site	Unknown/ Not evaluated	1991 (Gary S. Breschini and Trudy Haversat, Archaeological Consulting); 1991 (R. O. Gibson and J. Frierman, Gibson's Archaeological Consulting)	Outside
P-40-040842	N/A	Bridge	Recommended ineligible	1978 (Carroll Pursell, UCSB / California Inventory)	Outside

CEQA OPTIONS ANALYSIS

Based on the results of this preliminary environmental analysis and our understanding of the project and the project history, preliminary investigation and research, and background information provided by the CCSD, we anticipate that the appropriate level of documentation for compliance with CEQA will be an Initial Study leading to a Mitigated Negative Declaration (IS/MND) for any of the evaluated project alternatives. An IS/MND should be completed for the selected alternative, including all associated tasks necessary for completion of the CEQA process, with particular focus on avoiding or minimizing impacts to sensitive resources and anticipating and being responsive to concerns of Responsible Agencies (e.g., California Coastal Commission, State Parks, U.S. Fish and Wildlife Service, etc.). The IS/MND process will also require consultation with local Native American tribes per the requirements of Assembly Bill 52.

PROJECT PERMITTING

U.S. Army Corps of Engineers

If project activities are expected to result in direct impacts below the ordinary high water mark (OHWM) of San Simeon Creek or adjacent wetlands that have a continuous surface connection to San Simeon Creek, a Nationwide Permit (NWP) pursuant to Section 404 of the Clean Water Act (CWA) from the U.S. Army Corps of Engineers (USACE) would likely be required. It should be noted that HDD activities are considered a non-reporting activity and as such, do not require authorization by the USACE if avoiding waters of the U.S. and wetlands. However, ground disturbing activities associated with HDD methods including excavation of entry and exit pits that result in a direct impact to waters or wetlands would require USACE authorization. USACE wetlands are defined as those areas that support all three parameters including hydrophytic vegetation, hydric soils, and hydrology that has a continuous surface connection to waters of the U.S.

Field studies will be required to determine the presence and/or lateral extent of USACE waters and wetlands on site and potential permitting triggers.

California Coastal Commission

Under Section 30107.5 of the Coastal Act, Environmentally Sensitive Habitat Areas (ESHA) mean:

“Any area which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments”.

Further, under Section 30121 of the Coastal Act, the California Coastal Commission (CCC) identifies wetlands as:

“Lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swaps, mudflats, and fens”.

Based on the above, all sensitive biological resources including jurisdictional waters and wetlands would be considered ESHA and under the jurisdiction of the CCC. Field studies would be required to identify the presence of ESHA including sensitive habitats, special-status plants and wildlife, and jurisdictional features including single-parameter wetlands. Further, coastal boundary limits including but not limited to the originally retained jurisdiction of the CCC within the lower San Simeon Creek mainstem and estuary would need to be evaluated to determine whether a Coastal Development Permit would be required.

California Department of Fish and Wildlife

If project activities are expected to result in direct impacts to San Simeon Creek and/or the adjacent riparian/wetland habitat, a California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (SAA) notification pursuant to Division 2, Chapter 6, Sections 1600 through 1602 of the California Fish and Game Code, would likely be required. CDFW classifies a wetland as having at least one of the wetland parameters required by the USACE. It should also be noted that HDD methods are typically subject to notification pursuant to Section 1600 of Fish and Game Code.

Field studies are required to determine the presence and/or lateral extent of CDFW jurisdiction on site and potential permitting triggers.

Regional Water Quality Control Board

If project activities are expected to result in direct impacts to San Simeon Creek and/or the adjacent riparian/wetland habitat that are under the jurisdiction of the USACE, a Regional Water Quality Control Board (RWQCB) Water Quality Certification would be required pursuant Section 401 of the CWA. If project activities avoid impacting USACE waters and wetlands and do not require reporting under a NWP, the project would likely require submittal of a Report of Waste Discharge pursuant Section 401 of the CWA or General Order No. 2004-0004-DWQ.

Field studies are required to determine the presence and/or lateral extent of USACE waters and wetlands on site and potential permitting triggers.

California Department of Parks and Recreation

Any proposed project activities within California Department of Parks and Recreation (California State Parks) boundaries would likely require a California State Parks Right of Entry Permit. Early outreach and coordination with California State Parks is recommended to discuss existing sensitive resources on site with emphasis on known cultural sites and proposed avoidance and minimization measures to be implemented during project implementation. This early engagement will support the CEQA process as well as the Right of Entry permit process.

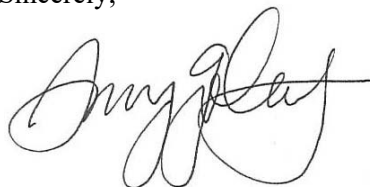
CONCLUSIONS

Based on a review of the proposed alternative pipeline routes and installation methods, impacts to sensitive botanical and wildlife resources, as well as riparian and/or wetland habitat is likely to occur with Alternatives 1 – 3. Though HDD methods are significantly less impactful than open trenching, Alternative 4 appears to follow the San Simeon Trail Access Road and is limited to the road shoulder of Highway 1 where habitat for sensitive biological resources is expected to be limited. Field studies would further support identifying the lateral limits of sensitive biological resources on site including presence/absence of special-status plants, wildlife, and waters/wetlands. If sensitive biological resources cannot be avoided, mitigation measures should be developed to reduce impacts to less than significant.

The northern end of each alternative is in close proximity (or as with Alternative #3, within) to known and potentially significant cultural resources. The mapping provided by the CCIC is approximate and the exact locations of the identified resources should be field verified. If possible, all ground disturbing activities should occur outside of the known resource boundaries, and they should be treated as Environmentally Sensitive Areas. If resources cannot be avoided, mitigation measures should be developed to reduce impacts to less than significant.

If you should have any questions regarding any of the information provided, please contact me at amy.golub@swca.com or (415) 533-7372.

Sincerely,



Amy Golub
Project Botanist

Attachments:

A – Figures

B – Site Plan of Alignment Alternatives

REFERENCES CITED/LITERATURE CITED

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ATTACHMENT A

Figures

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Figure A-1. Project Vicinity and Location Map

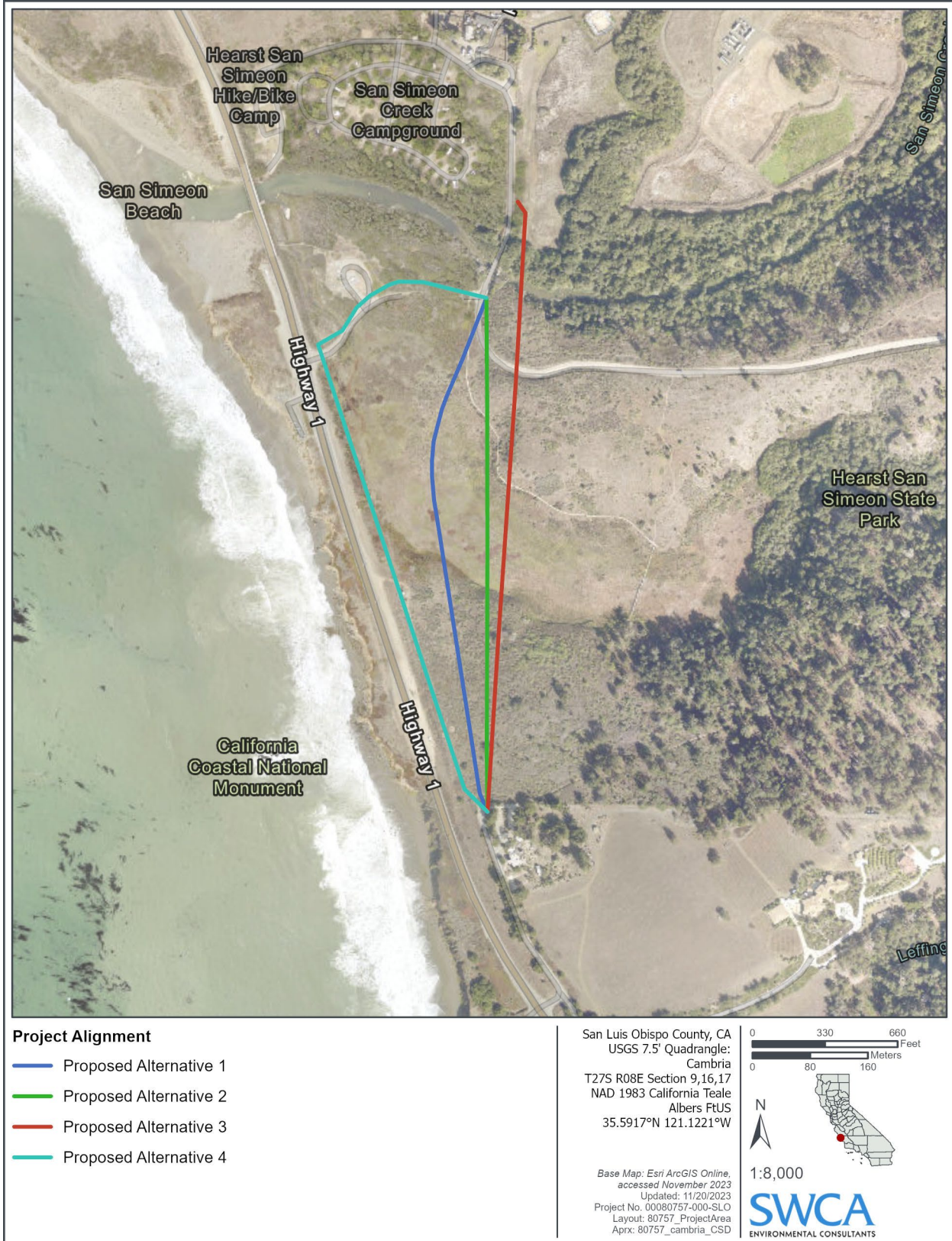


Figure A-2. Project Vicinity and Location Map

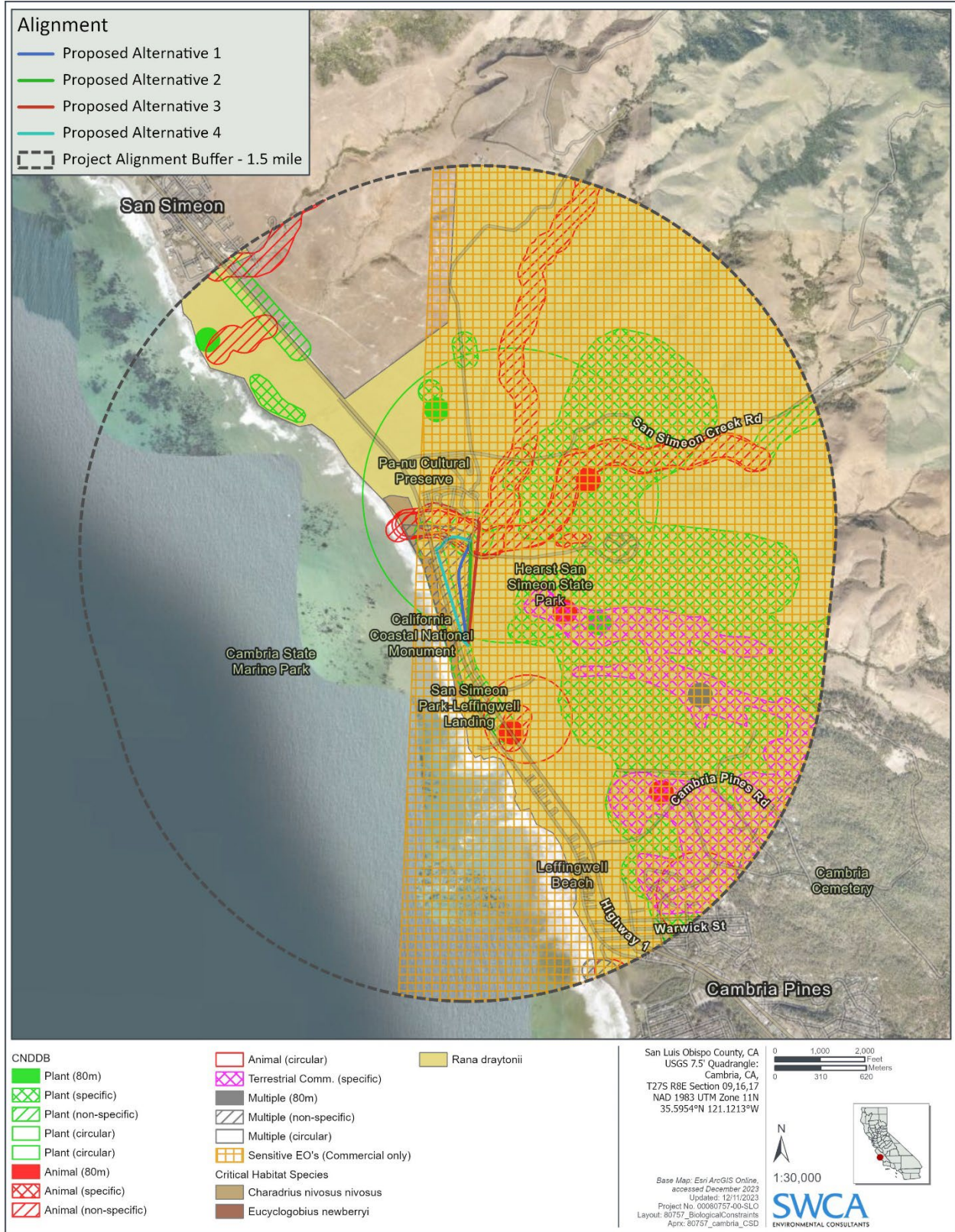


Figure A-3. 1.5-mile CNDDB and Critical Habitat Map



Figure A-4. National Wetland Indicator Map

APPENDIX B - GEOTECHNICAL OVERVIEW TECHNICAL MEMO (YEH AND ASSOCIATES)



Date: December 20, 2023
To: Mr. Larry Kraemer, PE
From: Luke Salemme, EIT, Judd King, PE, GE - Yeh and Associates
Subject: Cambria Community Services District Water and Wastewater Pipeline Replacement Project, Cambria, CA

Yeh and Associates is providing geotechnical services for the design of the Cambria Community Service District’s (District) Water and Wastewater Pipeline Replacement Project in response to a failure that occurred along the existing water pipeline in December 2021 within an existing easement at San Simeon State Park. Our services are being provided per task order for consulting services with Cannon for project number 23011, dated August 22, 2023.

Yeh and Associates visited the site on the afternoon of November 14, 2023, to review site geology and geomorphologic conditions that may impact the proposed alternative realignments for the pipelines. Yeh also took various photographs and measurements including the water depth of San Simeon Creek. The location of existing wells and proposed boring locations for further exploration were also reviewed. This memorandum summarizes the existing conditions at the site and alternatives for the pipeline’s realignment/replacement.

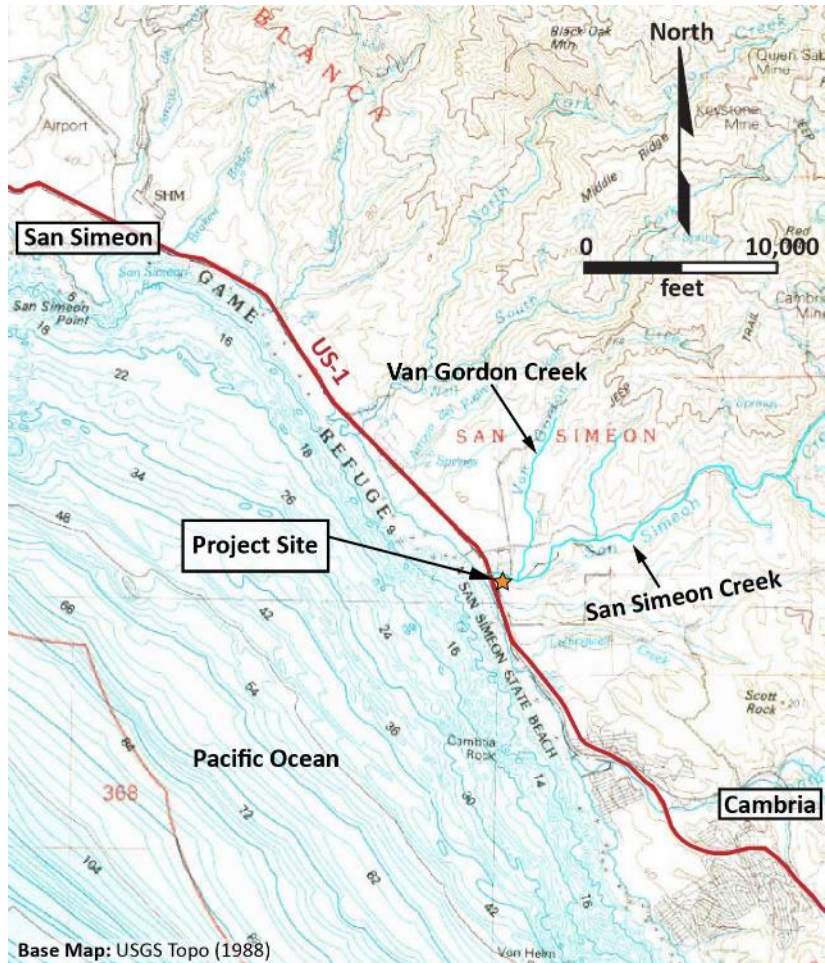


Figure 1: Project Location Map

1. EXISTING SITE CONDITIONS

The project site is located off Highway 1 in Hearst San Simeon State Park in the northern area of Cambria, California. The location of the project site is shown in Figure 1. The site geography is primarily wetlands adjacent to San Simeon Creek (See Figure 2 and Plate 1). Van Gordon Creek, the westernmost tributary, intersects San Simeon Creek in the vicinity of the project site. Elevations in the site vicinity range from approximately elevation 6 to 95 feet¹.

A vehicle bridge and adjacent pedestrian bridge cross San Simeon Creek with existing utilities connected to the underside of the bridges (See Figure 3). The vertical distance from the vehicle bridge deck to the bottom of the creek was 17 feet and 14 feet to the water surface on November 14, 2023, at approximately 3 pm. The water level at this portion of the creek may be tidal dependent due to its proximity to the ocean and observed water-line marks on the sides of the creek.



Figure 2: Wetlands at Project Site

Additionally, soil adjacent to the northern bridge abutment had been scoured 3 to 4 feet which was likely caused by runoff from storm events from 2023 (See Figure 3).

Potable water and treated effluent pipelines traverse State Parks property through wetlands and coastal land along an existing 25-foot-wide easement. We understand that the existing pipes are likely buried 3 to 5 feet in the ground. The December 2021 failure of the 14-inch diameter potable water line was replaced by a temporary overland bypass of fusion-welded 12-inch diameter High Density Polyethylene (HDPE) pipe. This pipe traverses the project site on the surface of

¹ CalTopo (2023), Online topography tool, accessed November 20, 2023, <https://caltopo.com/map.html#ll=35.59685,-121.11777&z=16&b=mbt>

the protected wetlands and is only trenched at its connections to the existing water pipeline near Exotic Gardens Road to the south and Washburn Campground Road near San Simeon Creek to the north. The existing potable water line was abandoned in the ground.

The second pipeline is an existing 12-inch diameter ductile iron pipe that transports treated effluent from the District’s wastewater treatment facility located 2.5 miles south of the project site to existing effluent disposal ponds east-northeast of the project site and San Simeon State Park.

2. PROPOSED ALTERNATIVES

Four alternatives are proposed by Cannon² for the water and wastewater pipelines’ replacement. The alternatives are shown on Plate 1 and are described below.

2.1 ALTERNATIVE 1

Alternative 1 includes replacing the two pipelines in the existing 25-foot-wide District easement through the protected wetlands on California State Parks property. The southern connection point to the existing pipelines for this alternative is located off Exotic Gardens Road. The realignment traverses the wetlands on State property, to the northern connection point located approximately 100 feet south of the pedestrian bridge on Washburn Drive inside the State campground. The length of this alignment is approximately 2,400 feet. The existing easement curves to the northeast within the wetlands area prior to the connection at Washburn Campground Road 100 feet south of San Simeon Creek. The new pipes would cross a sensitive habitat where open trenching is not likely allowed. Trenchless methods such as horizontal directional drilling (HDD), pipe bursting, or cured in-place pipe (CIPP) are being considered to replace the pipelines.



Figure 3: San Simeon Creek Conditions below Bridge on 11/14/23

² Alignment Alternatives Preliminary Design Report, Cambria Community Services District Water and Wastewater Pipeline Replacement Project, by Cannon, dated November 30, 2023

2.2 ALTERNATIVE 2

Alignment 2 includes replacing the two pipelines east of the existing 25-foot-wide District easement through the protected wetlands on California State Parks property. The southern connection point to the existing pipelines for this alternative is located off Exotic Gardens Road. The realignment traverses the wetlands on State property following a straight route to the northern connection point at Washburn Campground Road 100 feet south of San Simeon Creek. The length of this alignment is approximately 2,350 feet. The new pipes would cross a sensitive habitat where open trenching is not allowed. Trenchless methods such as horizontal directional drilling (HDD), pipe bursting, or cured in-place pipe (CIPP) are being considered to replace the pipelines. A new 25-foot-wide utility and access easement would be required for this alignment.

2.3 ALTERNATIVE 3

Alignment 3 includes replacing the two pipelines east of the existing 25-foot-wide District easement through the protected wetlands on California State Parks property. The southern connection point to the existing pipelines for this alternative is located off Exotic Gardens Road. The realignment traverses the wetlands on State property following a straight route beneath San Simeon Creek to the northern connection point located approximately 400 feet northeast of the intersection of Washburn Campground Road and San Simeon Trail Access Road within the District's property about 300 feet north of the pedestrian bridge. The length of this alignment is approximately 2,800 feet. The new pipes would cross sensitive habitats where open trenching is not likely allowed. Trenchless methods such as horizontal directional drilling (HDD), pipe bursting, or cured in-place pipe (CIPP) are being considered to replace the pipelines. A new 25-foot-wide utility and access easement would be required for this alignment.

2.4 ALTERNATIVE 4

Alignment 4 includes replacing the two pipelines outside of the protected wetlands. The southern connection point to the existing pipelines for this alternative is located off Exotic Gardens Road. The alignment extends approximately 140 feet west into the east side of the Caltrans Highway 1 right-of-way, where it continues approximately 2,100 feet north to the San Simeon Trail Access Road. The alignment then turns east and follows the San Simeon Trail Access Road to its northern connection point located approximately 100 feet south of the pedestrian bridge on Washburn Drive inside the State campground. The total length of this alignment is approximately 3,100 feet. This is the only alignment to avoid the protected wetlands on California State Parks property. Trenching is the proposed construction method for this alignment. Due to the size of the water and wastewater pipelines and separation requirements, it is expected that two separate trenches will be required for this alternative with a minimum separation of approximately 6 feet centerline to centerline.



3. GEOLOGIC SETTING

The project is located within the Coast Ranges geomorphic province, which extends from the Transverse Ranges in southern California to the Klamath Mountains in northern California and into Oregon. The province is characterized by north-northwest trending mountain ranges composed of sedimentary, volcanic, and metamorphic rocks. The basal units are predominantly composed of Jurassic and Cretaceous age rocks with Tertiary to Holocene age rocks commonly overlying the older formations along the flanks and foothills of those ranges. Quaternary sediments are found within intervening drainages, valleys, and coastal areas.

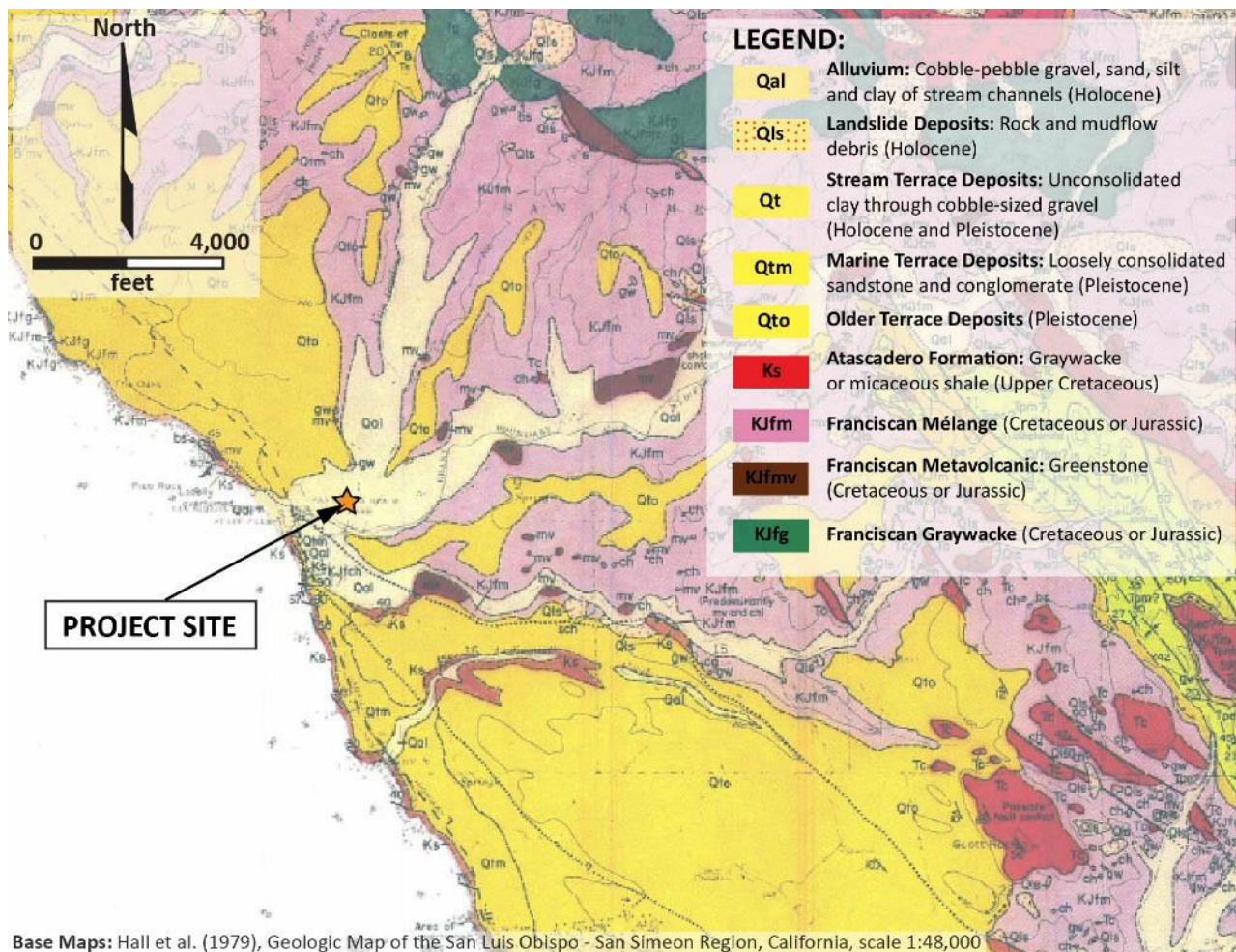


Figure 4: Geologic Map (Hall et al. 1979)

Figure 4 shows a portion of regional geology in the site vicinity as mapped by Hall et al.³ The site geology is mapped as Alluvial Deposits (Qal) and is described as “cobble – pebble gravel, sand, silt, and clay.” Adjacent to the site is mapped Marine Terrace Deposits (Qtm), Older Terrace Deposits

³ Hall et al. (1979), *Geologic Map of the San Luis Obispo – San Simeon Region, California*, scale 1:48,000.

(Qto), Atascadero Formation (Ks), Franciscan Mélange (KJfm), and Franciscan Metavolcanic (KJfmv). Plate 1 shows the site geology as mapped by Yeh.

4. SUBSURFACE CONDITIONS

Yeh reviewed site conditions and previous data available in the project vicinity. Log of Test Borings (LOTB) for the San Simeon Creek Bridge on Highway 1 (Bridge No. 49-46)^{4 5}, a monitoring well installed for the District near San Simeon Creek⁶, and as-built plans for the vehicle bridge⁷ within the campground that crosses the creek were reviewed. These data are included as Appendix A to this memorandum.

Low-lying wetlands are composed of Alluvial Deposits (Qal) surrounded by hills composed Older Terrace Deposits (Qto) (See Plate 1 and Figure 2). The alluvium is likely composed of clay and silt with various concentrations of gravel ranging between pebbles and cobbles and sand according to existing subsurface data reviewed. Older Terrace Deposits are described as poorly consolidated sand and clay-rich sand. The geologic contact between the alluvium and terrace deposits appears at the toe of the slopes; however, vegetation obscures the contact in many locations. Outcroppings of resistant Metavolcanic Rocks (KJfmv) described as metamorphosed basalt and diabase and Atascadero Formation (Ks) described as graywacke or sandstone and interbedded micaceous shale and siltstone are observed on surrounding hills and adjacent to San Simeon Creek. The depth and lateral extent of these outcrops are unknown, as they are also obscured by vegetation. However, outcrops of these materials were observed along San Simeon Creek and near the wetlands (see Plate 1). Additionally, artificial fill (Af) was observed along segments of San Simeon-Monterey Creek Road and approach embankments for the Highway 1 bridge above San Simeon Creek.

Previous subsurface conditions encountered from borings drilled in 1959 and 1983 for the Highway 1 San Simeon Creek Bridge include thick alluvial deposits composed of very soft to stiff clay with layers of slightly compacted sand and gravel overlying very dense sand and gravel deposits. The boring locations are shown in Plate 1. The overlying clayey layer descends approximately 60 feet below ground surface, with the underlying denser granular material found to the maximum depths explored of approximately 95 feet below ground surface. Groundwater within the borings was encountered at approximately 2 to 5 feet below the ground surface (roughly elevations 2 to 4 feet).

⁴ Caltrans (1959), Log of Test Borings, Highway 1 Bridge at San Simeon Creek, Br. No. 49-46

⁵ Caltrans (1983), Log of Test Borings, Foundation Report, and Pile Driving Records, Highway 1 Bridge at San Simeon Creek, Br. No. 49-46

⁶ State of California (2015), Well Completion Report No. e0283579, Well No. MW4, March 13, 2015

⁷ State of California – Department of General Services – Office of the State Architect (1984), *Vehicle Bridge Sections and Details and Abutment Plans & Details*, Sheets 8 and 9, April 9, 1984.



5. GEOTECHNICAL CONSIDERATIONS FOR THE PROPOSED ALTERNATIVES

Considerations for each alternative in relation to site geology and subsurface conditions, additional exploration and geotechnical services, constructability considerations, and rough order of magnitude cost of additional geotechnical services are presented below.

5.1 ALTERNATIVES 1 AND 2

Alternative 1 includes the installation of two new pipelines within the existing District easement that curves to the northeast within the wetlands area. Alternative 2 achieves the same goal as Alternative 1, but the pipeline will be installed in a straighter alignment than Alternative 1 along a new easement. Both alternatives connect to existing infrastructure on Washburn Campground Road approximately 100 feet south of the bridge over San Simeon Creek.

5.1.1 ANTICIPATED SUBSURFACE CONDITIONS

Alternatives 1 and 2 traverse through a range of geologic materials including Older Terrace Deposits (Qto) consisting of poorly consolidated sand and clay-rich sand, Alluvial Deposits (Qal) consisting of clay and silt with lenses of gravel ranging between pebble to cobble size, and sand. This alternative's route passes relatively close to an outcropping of Metavolcanic Rock (KJfmv) near the wetlands area that is composed of metamorphosed basalt and diabase with unknown depth and lateral extent. The groundwater level is likely relatively shallow within the wetlands. Variable soil types and subsurface conditions should be anticipated for these alternatives.

5.1.2 CONSTRUCTABILITY CONSIDERATIONS

Trenchless methods such as HDD utilize drilling mud to stabilize the borehole and facilitate the removal of soil cuttings. Soil type and particle size are an important factor in the design of the mud as well as the ability of the mud to remove materials from the bore path. Larger materials such as gravel, cobble, and boulders are difficult if not impossible to remove using drilling mud. The materials can also cause borehole instability and collapsing during drilling. Shallow groundwater and subsequent subsurface flow may occur beneath the wetlands due to the proximity of the project site to the Pacific Ocean and San Simeon Creek. Subsurface flow gradients can cause washing of drilling mud and further impact borehole stability and HDD success. The sandy soil combined with gravel ranging between pebbles to cobbles as well as shallow groundwater can impact the capability of conventional HDD methods. In addition, the resistant Metavolcanic Rocks (KJFmv) outcrop would likely inhibit or cause challenges to the HDD process and may require different tooling if it is encountered. The HDD bore path should be at sufficient depth to reduce the potential for inadvertent returns where drilling mud seeps out of the ground surface. Characterization of geotechnical and groundwater conditions will be needed as input to the design.

Pipe bursting is also being considered as a potential method for replacement for Alternative 1. Backfill of the existing pipe and the proximity of soil and rock types where the original pipe is buried is a design consideration. Upsizing the pipe is constrained by the existing pipe diameter and backfill materials. It is likely that native soil was used to backfill the existing pipe. Another consideration is the existing pipe material type and any concrete collars, thrust blocks or repairs which can inhibit the ability to use pipe bursting as an installation method.

5.1.3 ADDITIONAL GEOTECHNICAL SERVICES

Additional geotechnical services for this alternative should include field exploration, laboratory testing, and preparation of a *Geotechnical Report*. Three to five borings are recommended along the proposed alignments to depths of a minimum of 10 feet below proposed bottom of pipeline. Three approximate boring locations are noted on Plate 1 with additional locations to be determined. Borings are proposed at the southern connection point of Exotic Gardens Road, within the Older Terrace Deposits (Qto) close to its contact with the wetlands, and along Washburn Campground Road. A geophysical survey in the form of seismic refraction would enhance the subsurface profile and may act as a substitute for a boring(s) and is recommended. Additionally, seismic refraction would also aid in identifying any rock or materials within the alignment such as the metavolcanic rock outcrop observed near the wetland.

5.1.4 COST OF ADDITIONAL GEOTECHNICAL SERVICES

Rough order of magnitude costs in addition to Yeh's existing contract for geotechnical services for this alternative are anticipated in the range of \$75,000 to \$90,000. A refined scope of services and cost estimate would be provided following the selection of the preferred alternative based on current fee schedules as well as subcontractor and permitting costs at the time the services are to be performed.

5.2 ALTERNATIVE 3

Alternative 3 includes installation of two new pipelines within a new District easement located just east of Alternatives 1 and 2. Alternative 3 crosses below San Simeon Creek and connects to existing pipelines on the north side of the creek.

5.2.1 ANTICIPATED SUBSURFACE CONDITIONS

Alternative 3 passes through a range of geologic materials including Older Terrace Deposits (Qto) consisting of poorly consolidated sand and clay-rich sand, Alluvial Deposits (Qal) consisting of clay and silt with gravel ranging between pebble to cobble size, and sand, silt, and clay. This alternative's route passes relatively close to an outcropping of Metavolcanic Rock (KJfmv) composed of metamorphosed basalt and diabase with unknown depth and lateral extent and an Atascadero Formation (Ks) outcrop composed of graywacke or sandstone and interbedded micaceous shale and siltstone observed

adjacent to San Simeon Creek. The anticipated groundwater level is likely relatively shallow where the pipes will pass through the wetlands and the creek.

5.2.2 CONSTRUCTABILITY CONSIDERATIONS

Similar geotechnical considerations as Alternatives 1 and 2 are recommended for this alternative. However, there is also the crossing of the borepath below San Simeon Creek. This additional feature will increase the complications of using HDD for this pipeline replacement. There will be increased potential for inadvertent returns where the HDD borepath crosses below San Simeon Creek.

5.2.3 ADDITIONAL GEOTECHNICAL SERVICES

Additional geotechnical services for this alternative should include field exploration, laboratory testing, and preparation of a *Geotechnical Report*. Four to six borings are anticipated with proposed depths of a minimum of 10 feet below proposed bottom of pipeline alignment. Borings are recommended at the southern connection point of Exotic Gardens Road, within the Older Terrace Deposits (Qto) close to the connection point near the wetlands, along Washburn Campground Road, and in the alluvial plain east of Van Gordon Creek Road. A geophysical survey in the form of seismic refraction would greatly enhance the subsurface profile and may act as a substitute for a boring(s) and is recommended. Additionally, seismic refraction would allow more confidence in this route avoiding the Metavolcanic Rocks (KJfmv). The Atascadero Formation (Ks) outcrop is within areas of high vegetation and extends into San Simeon Creek. Geophysical surveys would be challenging to perform in this area; thus, an additional field visit should be performed to investigate the extents of this outcrop.

5.2.4 COST OF ADDITIONAL GEOTECHNICAL SERVICES

Rough order of magnitude costs in addition to Yeh's existing contract for geotechnical services for this alternative are anticipated in the range of \$75,000 to \$90,000. A refined scope of services and cost estimate would be provided following the selection of the preferred alternative based on current fee schedules as well as subcontractor and permitting costs at the time the services are to be performed.

5.3 ALTERNATIVE 4

Alternative 4 includes open cut trenching along the edge of the Highway 1 Caltrans right-of-way from the southern connection point at Exotic Gardens Road to the Washburn Day Use Driveway/San Simeon Trail Access Road where the pipes would head east-northeast to connect to the same northern terminus as Alternatives 1 and 2 near Washburn Campground Road.

5.3.1 ANTICIPATED SUBSURFACE CONDITIONS

Alternative 4 passes through a range of geologic materials including Older Terrace Deposits (Qto) consisting of poorly consolidated sand and clay-rich sand and Alluvial Deposits (Qal) consisting of clay



and silt with gravel ranging between pebble to cobble size, and sand. Artificial fill may be encountered beneath San Simeon Trail Access Road. The anticipated groundwater level is likely relatively shallow near San Simeon Creek.

5.3.2 CONSTRUCTABILITY CONSIDERATIONS

This alternative utilizes open cut methods as it avoids the protected wetlands within the State Park. Open cut excavations in areas with shallow groundwater may require stabilization of trench walls and/or dewatering. If dewatering is necessary, additional permitting may be required as this method reduces the water of the surrounding area and must be disposed of in a separate location or treated prior to disposal within a creek environment. This alternative would also involve working within the Caltrans right-of-way where additional permits and requirements may be necessary. Pipeline placement production rates in along San Simeon Trail Access Road would also be slower than normal production rates for pipeline open trenching due to shallow groundwater and unstable soil conditions.

5.3.3 ADDITIONAL GEOTECHNICAL SERVICES

Additional geotechnical services for this alternative should include field exploration, laboratory testing, and preparation of a *Geotechnical Report*. Five borings are anticipated with proposed depths of a minimum of 10 feet below proposed bottom of pipeline trench. Borings at a minimum are proposed at the southern connection point of Exotic Gardens Road, along Highway 1, and on San Simeon Trail Access Road. A Caltrans Encroachment Permit would be needed to perform the work within the Caltrans right-of-way.

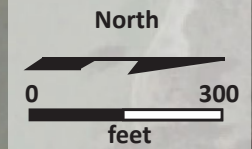
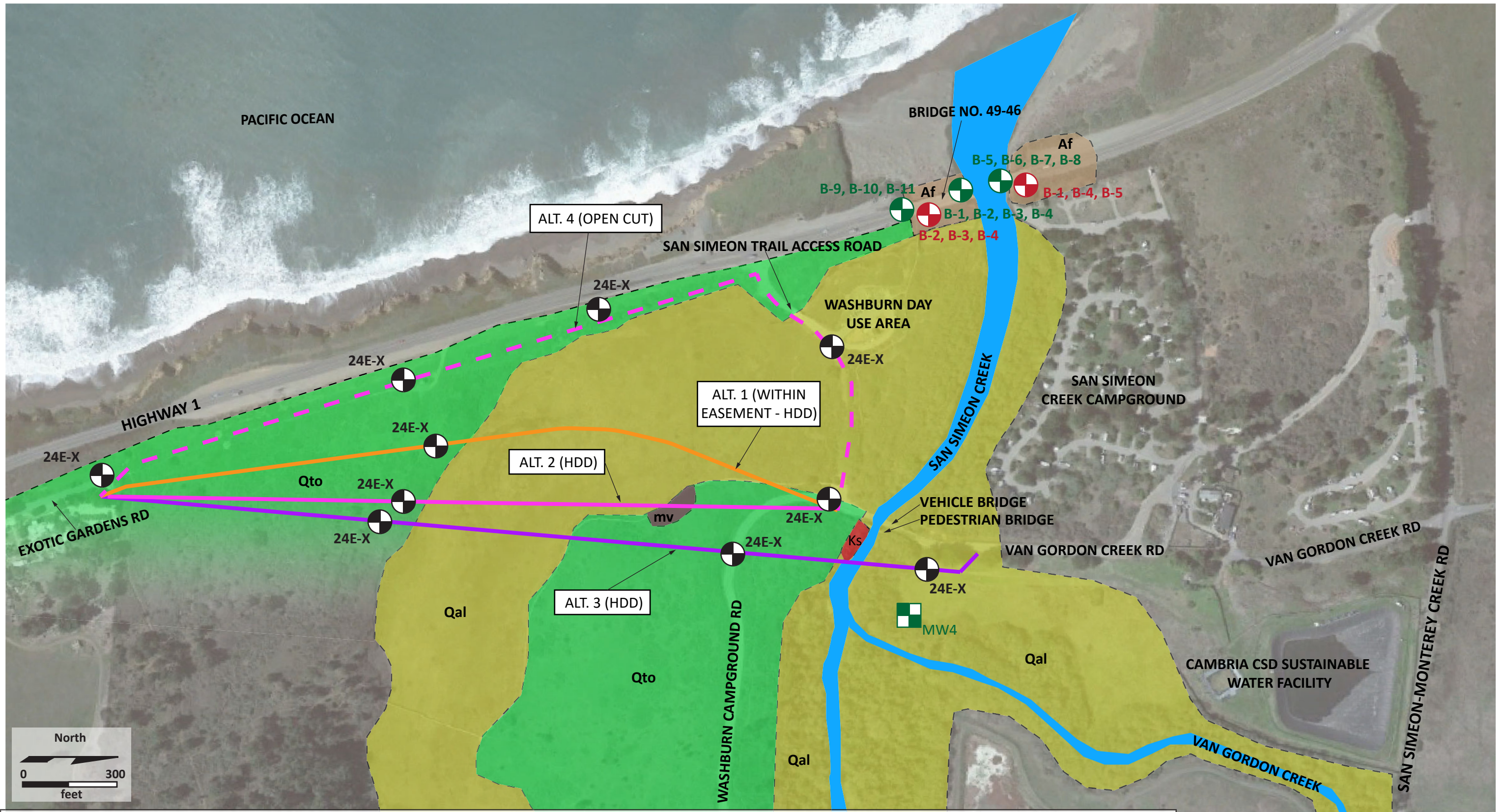
5.3.4 COST OF ADDITIONAL GEOTECHNICAL SERVICES

Rough order of magnitude costs in addition to Yeh's existing contract for geotechnical services for this alternative are anticipated in the range of \$50,000 to \$60,000. A refined scope of services and cost estimate would be provided following the selection of the preferred alternative based on current fee schedules as well as subcontractor and permitting costs at the time of selection.

6. PREFERRED ALTERNATIVE

Alternatives 1 and 2 are the likely preferred options from a geotechnical perspective. They avoid open trenching in soft and saturated ground. These two alternatives do not require the additional 500 feet of pipeline to cross below San Simeon Creek. If avoiding the wetlands and the HDD process altogether is desired, Alternative 4 is the next preferred alternative.

We trust this memorandum meets your needs at this time. Please contact Judd King at 805-801-6416 or jking@yeh-eng.com if you have questions or require additional information.



LEGEND:

- Proposed ALT. 1 (Orange line)
- Proposed ALT. 2 (Pink dashed line)
- Proposed ALT. 3 (Purple line)
- Proposed ALT. 4 (Green dashed line)

NOTE: See 'ALIGNMENT ALTERNATIVES' sheet by Cannon for existing utility alignments.

SYMBOLS:

- B-X** (Green/White circle): Approximate LOTB Location (Caltrans 1983)
- B-X** (Red/White circle): Approximate LOTB Location (Caltrans 1959)
- 24E-X** (Black/White circle): Proposed Boring Location (Yeh 2023)
- MW4** (Green/White square): Approximate Existing Well Location

GEOLOGIC UNITS:

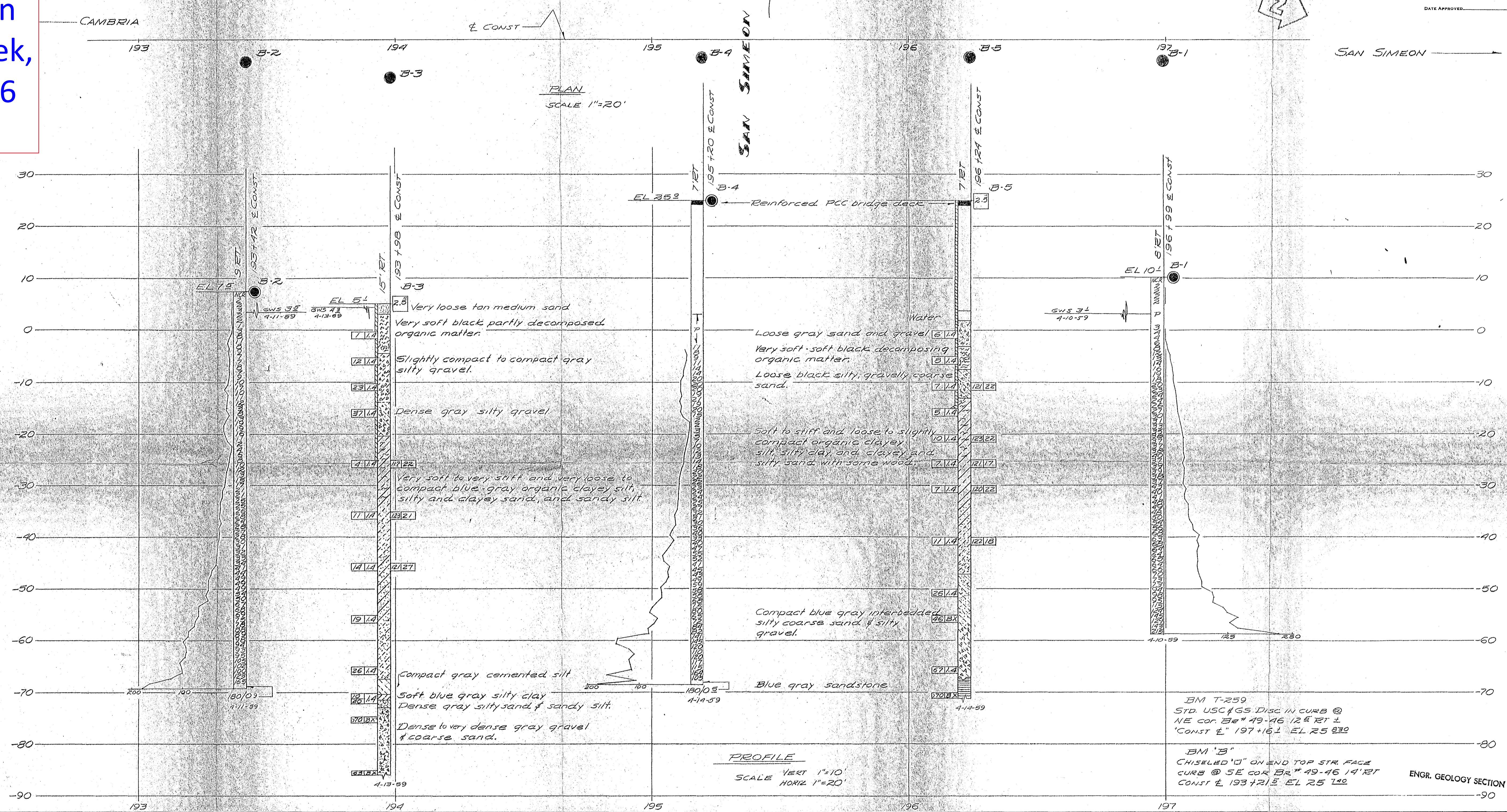
- Af** (Brown): Artificial Fill
- Qto** (Green): Older Terrace Deposits
- Qal** (Yellow): Alluvium
- Ks** (Red): Atascadero Formation
- mv** (Purple): Franciscan Metavolcanic
- (Dashed line): Approximate Geologic Contact Location

Yeh and Associates, Inc.
 Geotechnical • Geological • Construction Services

FIELD PLAN

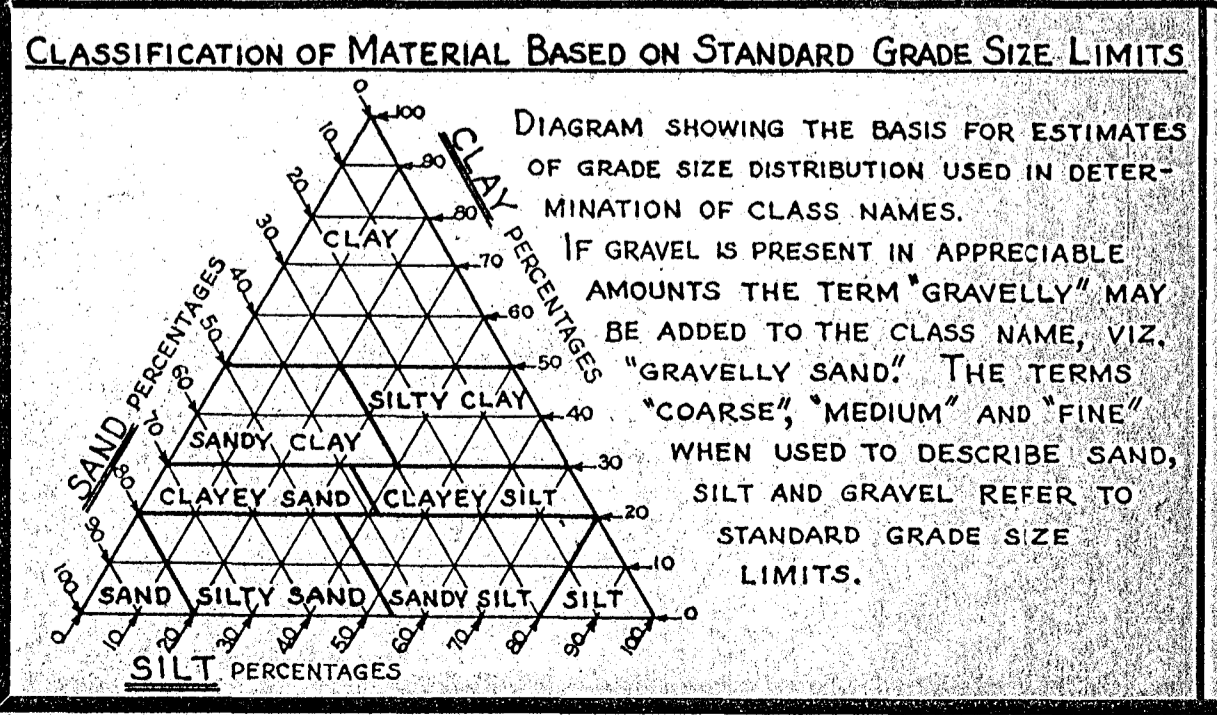
PROJECT NAME: CAMBRIA CSD WATER - WASTERWATER PIPELINES Cambria, CA	PLATE 1
PROJECT NUMBER: 223-121	REVISION DATE: 12/19/2023

Highway 1
Bridge at San
Simeon Creek,
Br. No. 49-46
(1959)



FIELD STUDY BY NELSON 4-59
DRAWN BY SURAK 7-59
CHECKED BY NELSON 11-59
Approval Recommended by _____
Engineer/Geologist
Official Title _____

BRIDGE DEPARTMENT



LEGEND OF EARTH MATERIALS

GRAVEL	SILTY CLAY OR CLAYEY SILT
SAND	PEAT AND/OR ORGANIC MATTER
SILT	FILL MATERIAL
CLAY	IGNEOUS ROCK
SANDY CLAY OR CLAYEY SAND	SEDIMENTARY ROCK
SANDY SILT OR SILTY SAND	METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

- PLAN OF ANY BORING
- PENETROMETER
- 2 1/4" CONE PENETROMETER
- SAMPLER BORING (DRY)
- ROTARY BORING (WET)
- AUGER BORING (DRY)
- JET BORING
- CORE BORING
- TEST PIT

NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans. Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

**SAN SIMEON CREEK BRIDGE
WIDENING
LOG OF TEST BORINGS**

SCALE AS SHOWN BRIDGE 49-46 FILE DRAWING

PE 6371-3

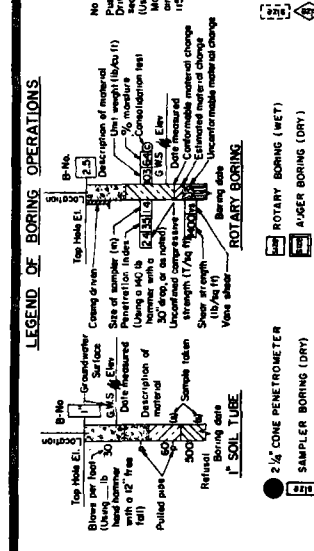
Highway 1
Bridge at San
Simeon Creek,
Br. No. 49-46
(1983)

DIST	COUNTY	ROUTE	POST MILES-TOTAL PROJECT	SHEET	TOTAL
02	CLC	1	52.7/53.4	25	25

Robert L. Reynolds #165
ENGINEERING GEOLOGIST
DATE APPROVED August 22, 1983

BENCH MARK
BM 7-253 Elev. 25.63

REDUCED PLAN
USE SCALE BELOW



LEGEND OF EARTH MATERIALS

GRAVEL	SAND	SILT	CLAY	SANDY CLAY or SANDY SILT	SILT CLAY or CLAYEY SILT	PEAT and/or ORGANIC MATERIAL	FILL MATERIAL	IGNEOUS ROCK	SEDIMENTARY METAMORPHIC ROCK
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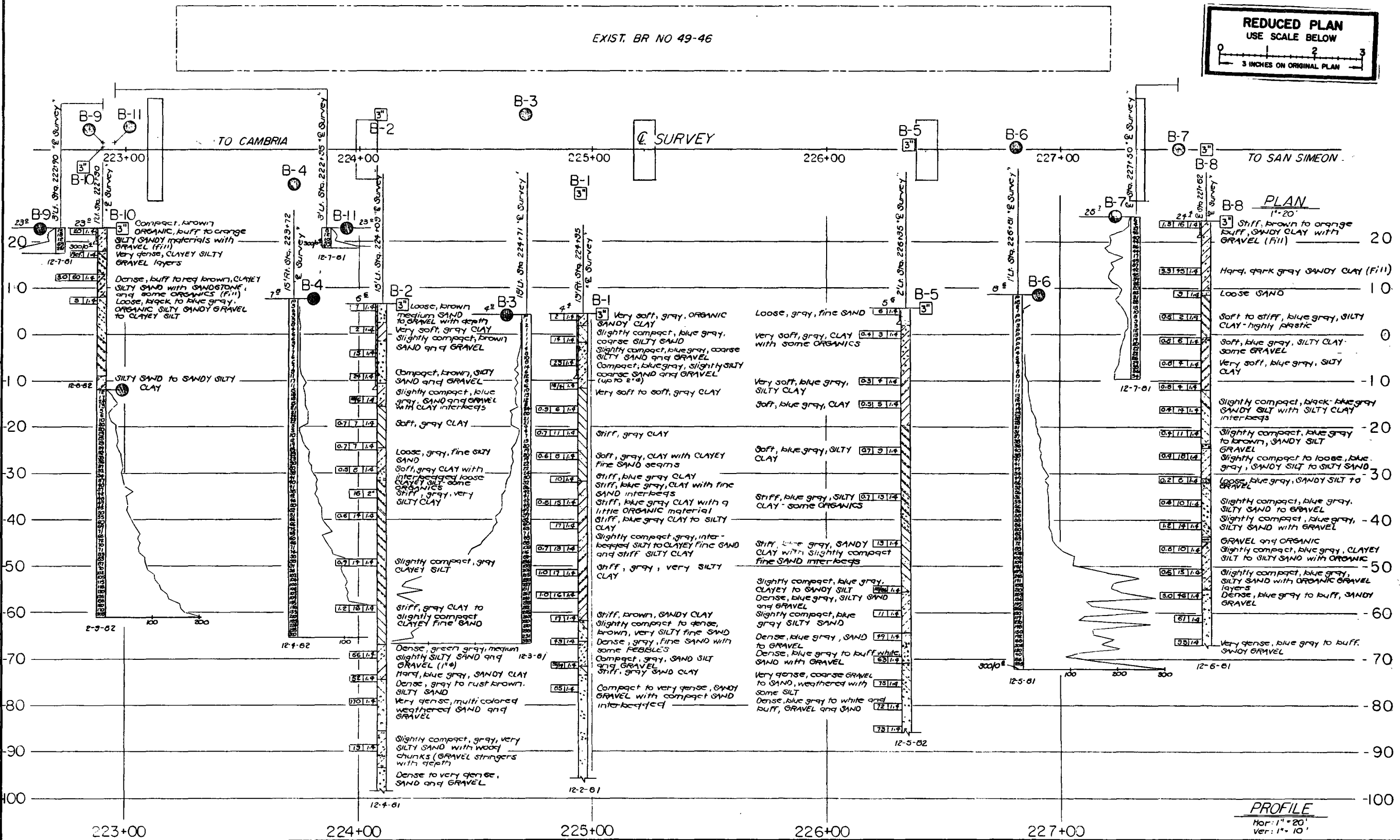
CONSISTENCY CLASSIFICATION FOR SOILS

Penetration (lb/100 ft²)	Cohesive		Non-cohesive	
	Granular	Very soft to Very hard	Very loose to Very dense	Very soft to Very hard

NOTE: Classification of earth material on shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

UNIFIED SOIL CLASSIFICATION SYSTEM

Symbol	Soils and Clays	Soils and Clays	Highly Organic Soils
MH	Medium High Plasticity Silts and Clays	ML	Low Plasticity Silts and Clays
CH	High Plasticity Clays	CL	Low Plasticity Clays
OH	High Organic Clays	OL	Low Organic Clays



ENGINEERING GEOLOGY AND TECHNICAL SERVICES BRANCH - TRANSPORTATION LABORATORY

State of CALIFORNIA DEPARTMENT OF TRANSPORTATION

STRUCTURES - DESIGN

BRIDGE NO. 49-46
POST MILE 52.9

SAN SIMEON CREEK BRIDGE
LOG OF TEST BORINGS

BRIDGE NO. 49-46
POST MILE 52.9

REVISION DATES (PRELIMINARY STAGE ONLY)

25

03 0146 100-00 25-102

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

CU 05201
WO 276801

Disregard prints bearing earlier revision dates

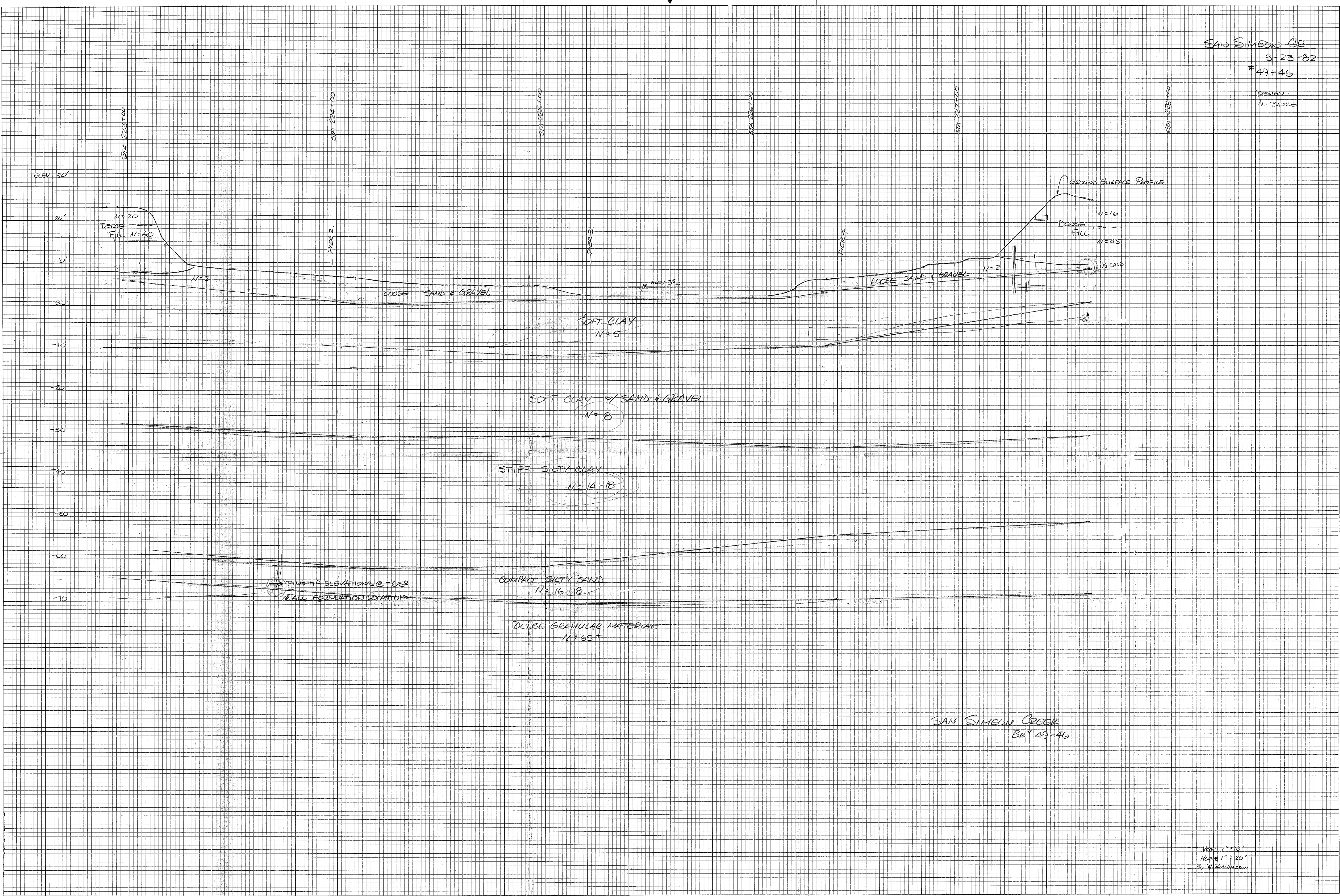
DRAWN BY _____ DATE _____
 CHECKED BY _____ DATE _____
 PROJECT NO. _____ DATE _____
 SURVEYED BY _____ DATE _____
 PLANNED BY _____ DATE _____
 FIELD BOOK NO. _____ DATE _____

PLOTTED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 INKED BY _____ DATE _____
 SURVEYED BY _____ DATE _____
 PLANNED BY _____ DATE _____
 FIELD BOOK NO. _____ DATE _____

SCALE: 1 INCH = 10 FEET
 CROSS SECTIONS

SCALE: 1 INCH = 10 FEET
 CROSS SECTIONS

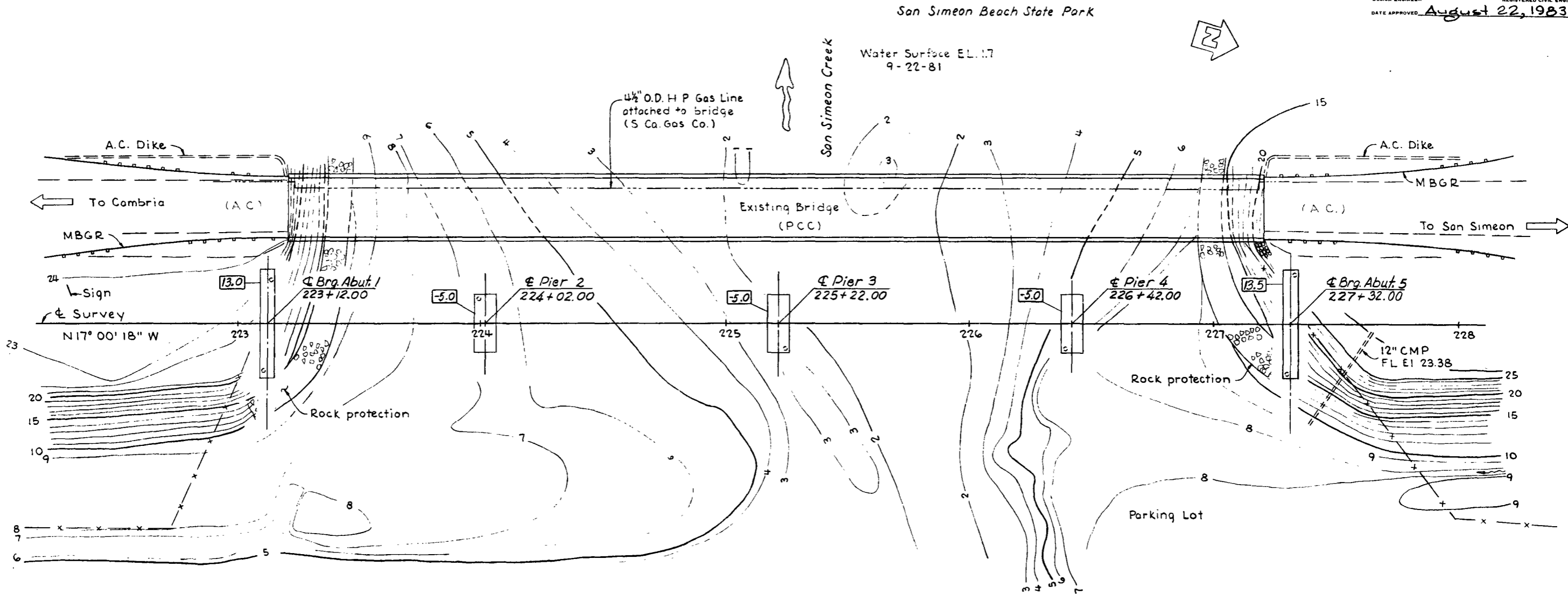
SAN SIMON CR
 3-23-82
 #49-46
 DESIGN:
 AL-BALLER



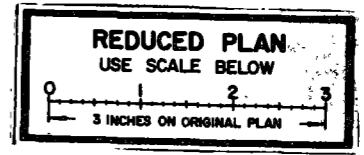
VERT 1" = 10'
 HORIZ 1" = 20'
 BY R. RICHARDSON

DIST. COUNTY ROUTE POST MILES

DIST. COUNTY ROUTE POST MILES



Note:
 Abutments and Piers are on Brg. N72°59'42"E.
 [0.0] indicates bottom of footing elevation



B.M T 259
 Fd std U.S.C. & G.S. base
 disk 35" Lt " & Survey"
 227+17±
 Elev. 25.63

**GENERAL NOTES
LOAD FACTOR DESIGN**

DESIGN: AASHTO dated 1981 with interims and as supplemented by BRIDGE DESIGN SPECIFICATIONS inserts.
 DEAD LOAD: Includes 35 psf for future wearing surface.
 LIVE LOADING: HS20-44 and alternative and permit design load.
 REINFORCED CONCRETE: $f'_c = 4,000$ psi
 $f'_s = 3,250$ psi
 $n = 9$
 Transverse deck slabs (working Stress Design)
 $f'_c = 20,000$ psi
 $f'_s = 1,200$ psi
 $n = 10$
 PRESTRESSED CONCRETE: See "Prestressing Notes"

HYDROLOGIC SUMMARY

DRAINAGE AREA:	35	square miles
FREQUENCY (Years)	50	DESIGN FLOOD
DISCHARGE (Cubic feet per second)	9250	BASE FLOOD
WATER SURFACE (Elevation at bridge)	12	13

Flood plain data are based upon information available when the plans were prepared and are shown to meet Federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.

PRELIMINARY INVESTIGATION SECTION				DESIGN	By <i>A. Baer</i>	Checked <i>M.E. Couley 8/82</i>	Stat of CALIFORNIA DEPARTMENT OF TRANSPORTATION STRUCTURES - DESIGN 7 <i>Albert Baer</i> REGISTERED CIVIL ENGINEER NO. 52.9	BRIDGE NO.	49-46	SAN SIMEON CREEK BRIDGE FOUNDATION PLAN		
SCALE	DATUM	PHOTOGRAMMETRY AS OF	DRAWN	By <i>F. Yee</i>	10-81	Checked <i>M.E. Couley 8/82</i>		POST MILE	52.9			
ALIGNMENT TIES PR-4946-2,3	SURVEYED	By <i>H.D.</i>	9-81	TRACED	By <i>F. Yee</i>	10-81		QUANTITIES	By <i>J. Hinton</i>		8-82	Checked <i>Bradford</i>
FIELD CHKD	By <i>H.D.</i>	11-81	CHECKED	By <i>H.D.</i>	11-81							

18

**GEOLOGY
COPY**

M memorandum

To : R. C. Cassano, Chief
Office of Structures Design

Attention: Al Bacher
Design Section 07

Date: April 1, 1982

File : 05-SLO-1-52.9
05201 - 276801

SAN SIMEON CREEK BRIDGE
Bridge No. 49-46

From : **DEPARTMENT OF TRANSPORTATION - 739-2487**
Office of Transportation Laboratory

Subject: Foundation Investigation for San Simeon Creek Bridge

A foundation study was completed at the site during December, 1981 by the Engineering Geology and Technical Services Branch of the Transportation Laboratory. The study consisted of five rotary sample borings and six cone penetration tests. Borings are shown on the "Log of Test Borings" dated March, 1982. Site data from Office of Structures Design 7, Foundation Plan dated October, 1981.

Geology

Two distinct geologic units were encountered at the site: (1) thick deposits of Holocene alluvium composed of very soft to stiff silty clay containing layers of slightly compact sand and gravel, and (2) a basal (Pleistocene?) deposit of dense to very dense sand and gravel. Approximately 15 feet of approach embankment was drilled at the proposed abutment locations.

Groundwater was encountered as high as elevation 3.0 during December, 1981.

Fault and Seismic Data

There are several known active faults in the vicinity of the site. The Rinconada, Cambria, San Simeon and Hosgri Faults are the most active. A horizontal rock acceleration of 0.7g and depth to rock-like material of over 150 feet are recommended for use in the design of the structure.

Foundation Recommendations

Recommendations are for the structure shown on the "General Plan" dated January, 1982.

Class 70C (corrosion resistant) concrete piles are recommended for structure support. The ultimate pile loading for design purposes is 2x design load.

Foundation Data

<u>Support Number</u>	<u>Specified and Probable Pile Tip Elevation</u>
*Abutment 1	-60.0
Pier 2, 3, 4	-65.0
*Abutment 5	-60.0

*All abutment piles should be predrilled to elevation +3.

San Simeon Creek Bridge
April 1, 1982
Page 2

Piles should "set up" overnight after reaching specified tip before bearing is checked under the hammer.

A Tremmie seal will be required for piers 2, 3, and 4.

Due to the layer of loose saturated sand below the approach fill, liquifaction could take place during a severe earthquake. A type I approach slab is recommended at each abutment.

Report by



Ron Richardson
Assistant Transportation Engineer

RR/rdb

cc: Preliminary Report
R. E. Pending File
District 05 (2)
FHWA: D. F. Bolton (1)
D. Hager
A. Goldschmidt
File (2)

PILE QUANTITY & DRIVING RECORD (DRIVEN PILES)

20C8C78 (REV 8/81)

JOB STAMP
 05-SLO-1-52.7/53.4 05-276804(503)
 BRF-F-P001(133) Nr Cambria, 0.2-mi S
 to 0.5-mi N of San Simeon Crk Br

SHEET NO. 48 _____

BRIDGE NO. 49-46 ITEM DESCRIPT Furnish pile class 70c PILING
 BRIDGE NAME SAN SIMON CRK BRIDGE TYPE PILE USED 12" PRECAST PRESTRESSED
 ABUT/OR BENT NO. 5 FTG _____ FTG TYPE _____ BOTTOM FTG ELEV. 13.50
 HAMMER MAKE Del. Mag MODEL 30 E = S4,200 @ 60 BPM
 DESIGN BRNG. 70 REQUIRED BRNG. 70 BLOW/FT AT REQUIRED BRNG. 18
 PILE DRIVING INSPECTED BY _____ PILE QUANTITY CALC BY _____ DATE _____
 PILE CONCRETE PLACING INSP. BY _____ PILE QUANTITY CHECK BY _____ DATE _____

PILE NO	DATE PILE DRIVEN	BLOWS PER FOOT	DATE PILE CONCRETE PLACED	(1) SPEC. TOP OF PILE ELEV.	(2) SPEC. TIP ELEV.	(3) LENGTH IN LEADS	(4) LENGTH OF CUT OFF	(5) ACTUAL LENGTH IN GROUND (3-4)	(6) ACTUAL TIP ELEV (1-5)	(7) PAY LENGTH * SEE NOTE BELOW	REMARKS	PRE DRILL HOLE DEPTH	LENGTH OF RE-BAR REQ.
1	5-28-71	21		13.75	60.00	74		74	-60.25	73.75			
2	5-28-71	20				74		74	-60.25	73.75			
3	5-28-71	30				74		74	-60.25	73.75			
4	5-30-71	1				78					Broke @ 40'		
5	5-30-71	34				78			-60.25	77.75	in ground (Rej) Batter		
6	5-30-71	33				78			-60.25	77.75	Batter		
7	5-30-71	32				78			-60.25	77.75	Batter		
8	5-30-71	4		13.75	60.00	78			-60.25	77.75	Batter Retap OK		
-	5-28-71	32				77			-59.3	77.0	Batter Add pile 4A		

SHEET TOTALS ITEM NO. _____ EA. ITEM NO. 24 609.25 L.F. FILE CATEGORY 48

* THE PAY LENGTH IS THE ACTUAL LENGTH IN THE GROUND, EXCEPT THAT NO PAY WILL BE MADE FOR THAT LENGTH OF PILE DRIVEN BELOW THE ELEVATION WHERE SPECIFIED TIP AND/OR SPECIFIED BEARING (WHICHEVER IS LOWER) WAS OBTAINED ALSO, WHEN STEEL PILES ARE SUBSTITUTED FOR CLASS 45.1 45.2, OR 70 PILING, THE LOWER LIMIT FOR PAYMENT WILL BE NO LOWER THAN THE SPECIFIED TIP ELEVATION

Drawn By C. FOSTER Date 4-10-84

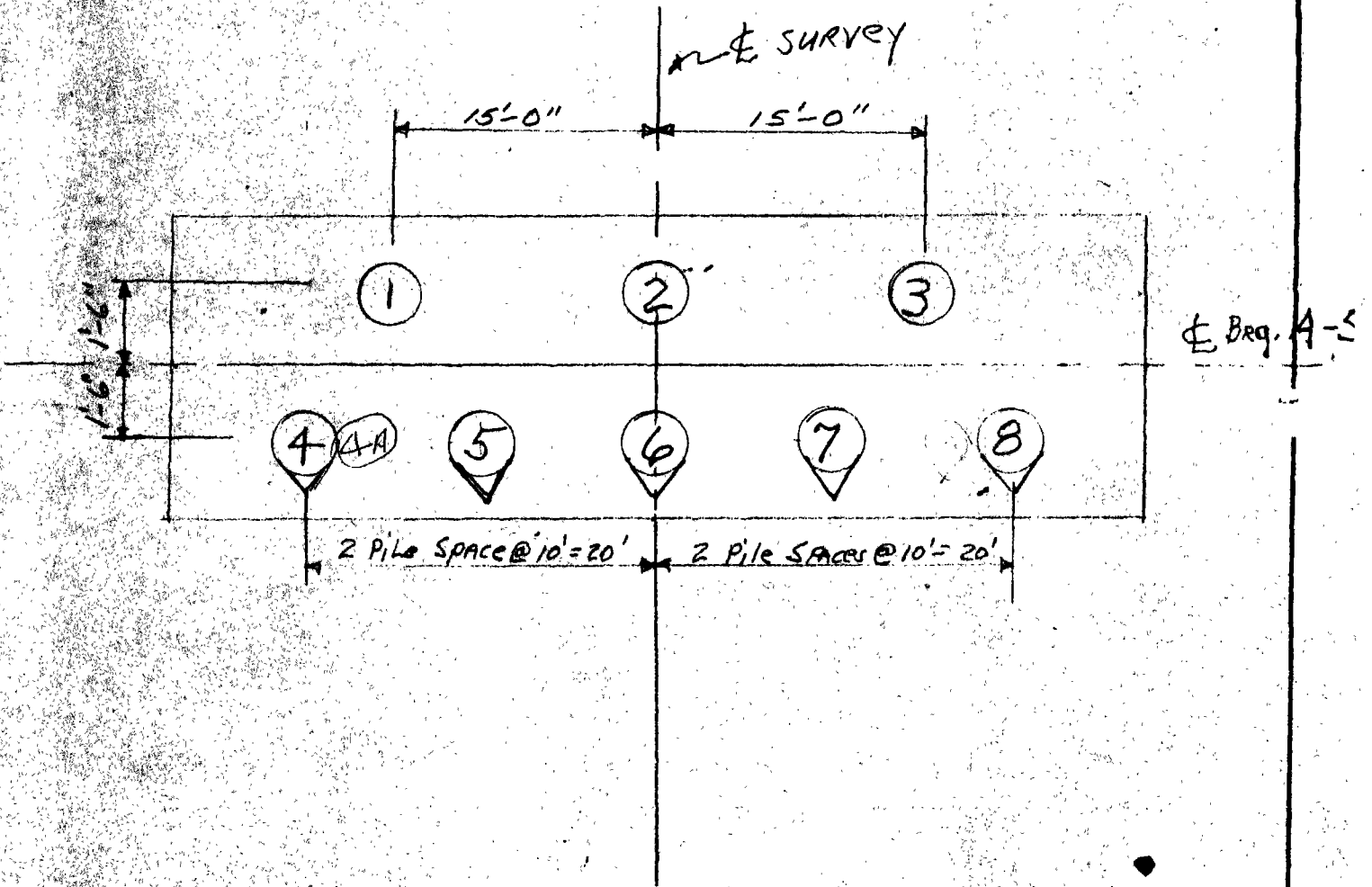
Sheet No _____

Checked By _____ Date _____

Bridge No 49-46 Bridge Name SAN SIMEON CREEK BRIDGE

Abutment or Bent No 5 Ftg _____

Ftg Type _____ Bot Ftg Elev 13.50



SCALE _____

PILE QUANTITY & DRIVING RECORD (DRIVEN PILES)

DCSC78 (REV. 8/81)

JOB STAMP

09-SLO-1-52.7/53.4 05-276804(503)
BRF-P001(133) Nr Cambria, 0.2-mi S
to 0.5 mi N of San Simeon Crk Br

SHEET NO. 48 _____

BRIDGE NO. 49-46

ITEM DESCRIPT FURNISH Pile CLASS 70C PILING

BRIDGE NAME SAN SIMEON CREEK BRIDGE

TYPE PILE USED 12" PRECAST Prestressed

ABUT OR BENT NO. P-2

FTG _____

FTG TYPE _____

BOTTOM FTG ELEV. -5.00

HAMMER MAKE Delmag

MODEL D-30

E = 54200

DESIGN BRNG. 70 T

REQUIRED BRNG. 70 T

BLOW/FT AT REQUIRED BRNG. 18

PILE DRIVING INSPECTED BY Inagaki

PILE QUANTITY CALC BY Trugel DATE _____

PILE CONCRETE PLACING INSP. BY _____

PILE QUANTITY CHECK BY _____ DATE _____

PILE NO.	DATE PILE DRIVEN	BLOWS PER FOOT	DATE PILE CONCRETE PLACED	(1) SPEC. TOP OF PILE ELEV.	(2) SPEC. TP ELEV.	(3) LENGTH IN LEADS	(4) LENGTH OF CUT-OFF	(5) ACTUAL LENGTH IN GROUND (3-4)	(6) ACTUAL TP ELEV (1-5)	(7) PAY LENGTH * SEE NOTE BELOW	REMARKS	PRE DRILL HOLE DEPTH	LENGTH OF RE-BAR REQ.
1	6-5-84	27		-5.25	-65.00	60'		60'	-64.75	60'			
2	6-5-84	31		-4.75									
3	✓	36											
4	✓	30											
5	✓	30											
6	✓	28											
7	✓	28											
8	6-5-84	28*									driven to ~ -57 on 6-7-84		
9	✓	24											
10	✓	30											
11	✓	24									log pile		
12	✓	23											
13	✓	22											
14	✓	20									~6' drop		
15	✓	18											
16	6-5-84	10							-65				
17	6-6-84	50							-64.75				
18	✓	30											
19	✓	32											
20	✓	26											
21	✓	29											
22	✓	29											
23	✓	26											
24	6-6-84	20		-5.25	-65.00				64.75	60.0			

SHEET TOTALS ITEM NO. _____ EA. ITEM NO. 24 1440 L.F. FILE CATEGORY 48

* THE PAY LENGTH IS THE ACTUAL LENGTH IN THE GROUND, EXCEPT THAT NO PAY WILL BE MADE FOR THAT LENGTH OF PILE DRIVEN BELOW THE ELEVATION WHERE SPECIFIED TP AND/OR SPECIFIED BEARING (WHICHEVER IS LOWER) WAS OBTAINED. ALSO, WHEN STEEL PILES ARE SUBSTITUTED FOR CLASS 45.1 THE LOWER LIMIT FOR PAYMENT WILL BE NO LOWER THAN THE SPECIFIED TP ELEVATION.

DEPARTMENT OF TRANSPORTATION

PILE LAYOUT SHEET

DH-05 C80 (REV. 11-73)

JOB STAMP

05-SLO-1-52.7/53.4 05-276804(503)
BRF-P001(133) Nr Cambria, 0.2-mi S
to 0.5-mi N of San Simeon Crk Br

Drawn By CHRIS FOSTER Date 4-10-84

Sheet No _____

Checked By _____ Date _____

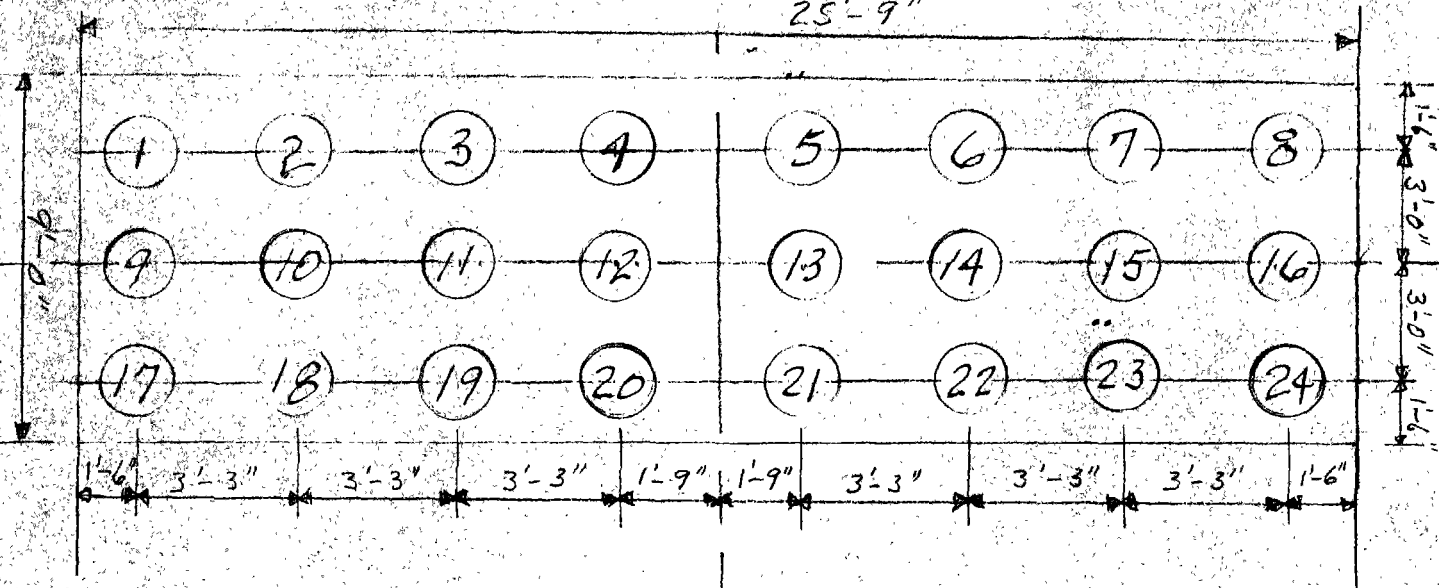
Bridge No 49-46 Bridge Name SAN SIMEON CREEK BRIDGE

Abutment or Bent No P-2 Ftg _____ Ftg Type _____ Bot. Ftg Elev _____



± SURVEY

25'-9"



SCALE _____

PILE QUANTITY & DRIVING RECORD (DRIVEN PILES)

JOB STAMP
 05-SLO-1-52.7/53.4 05-276804(503)
 BRF-F-P001(133) Nr Cambria, 0.2-mi S
 to 0.5-mi N of San Simeon Crk Br

DC-SC78 (REV. 8/81)

SHEET NO. 48

BRIDGE NO. 99-46 ITEM DESCRIPT PURISH Pile CLASS 70C PILING
 BRIDGE NAME SAN SIMEON CREEK BRIDGE TYPE PILE USED 12" Precast Prestressed
 ABUT OR BENT NO. P-3 FTG _____ FTG TYPE _____ BOTTOM FTG ELEV. -5.00
 HAMMER MAKE Delmag MODEL D-30 E= 54200
 DESIGN BRNG. 70T REQUIRED BRNG. 70T BLOW/FT AT REQUIRED BRNG. 18
 PILE DRIVING INSPECTED BY _____ PILE QUANTITY CALC BY T. Singer DATE _____
 PILE CONCRETE PLACING INSP. BY _____ PILE QUANTITY CHECK BY _____ DATE _____

PILE NO	DATE PILE DRIVEN	BLOWS PER FOOT	DATE PILE CONCRETE PLACED	(1) SPEC TOP OF PILE ELEV	(2) SPEC. TIP ELEV	(3) LENGTH IN LEADS	(4) LENGTH OF CUT-OFF	(5) ACTUAL LENGTH IN GROUND (3-4)	(6) ACTUAL TIP ELEV (1-5)	(7) PAY LENGTH * SEE NOTE BELOW	REMARKS	PRE DRILL HOLE DEPTH	LENGTH OF RE-BAR REQ.
1	6-7-84	12		-5.25	-65.00	60		60.0	-64.75	60.0			
2	✓	14											
3	6-7-84	15											
4	6-7-84	14											
5	6-7-84	7											
6	6-8-84	32									Relap		
7	✓	30											
8	✓	32											
9	6-7-84	12											
10	✓	15											
11	✓	15											
12	✓	24											
13	✓	16											
14	✓	19											
15	✓	12											
16	✓	16											
17	6-7-84	9											
18	✓	15											
19	✓	11											
20	6-7-84	-											
21	6-7-84	12											
22	✓	10											
23	6-7-84	13											
24	✓			-5.00	-65.00	60		60.0	64.75	60.0			
	6-7-84	12											

SHEET TOTALS ITEM NO. _____ EA. ITEM NO. 24 1440 L.F. FILE CATEGORY 48

* THE PAY LENGTH IS THE ACTUAL LENGTH IN THE GROUND, EXCEPT THAT NO PAY WILL BE MADE FOR THAT LENGTH OF PILE DRIVEN BELOW THE ELEVATION WHERE SPECIFIED TIP AND/OR SPECIFIED BEARING (WHICHEVER IS LOWER) WAS OBTAINED. ALSO, WHEN STEEL PILES ARE SUBSTITUTED FOR CLASS 45 1 45.2 OR 70 PILING, THE LOWER LIMIT FOR PAYMENT WILL BE NO LOWER THAN THE SPECIFIED TIP ELEVATION.

DEPARTMENT OF TRANSPORTATION
PILE LAYOUT SHEET
 DH-OS-C80 (REV. 11-73)

JOB STAMP

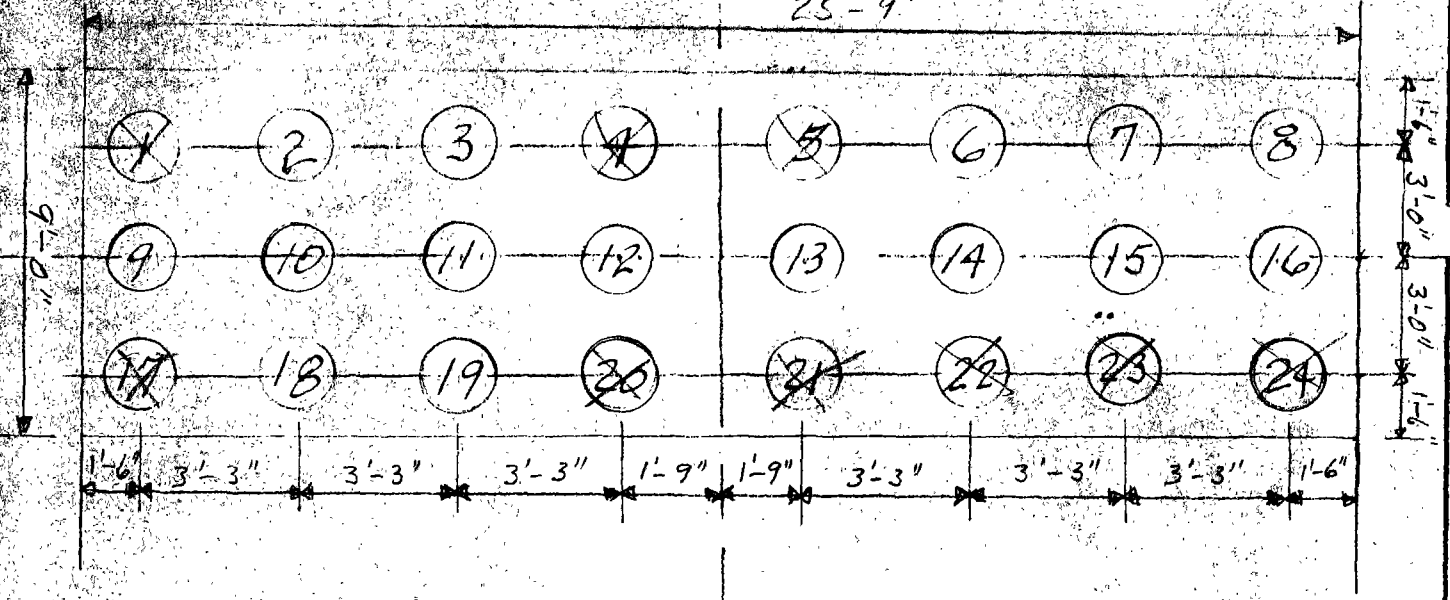
05-SLO-1-52.7/53.4 05-276804(503)
 BR-F-P001(133) Nr Cambria, 0.2-mi S
 to 0.5-mi N of San Simeon Crk Br

Drawn By C. FOSTER Date 7-10-84 Sheet No _____
 Checked By _____ Date _____
 Bridge No _____ Bridge Name SAN SIMEON CREEK BRIDGE
 Abutment or Bent No P-3 Ftg _____ Ftg Type _____ Bot Ftg Elev -5.00



Survey

25'-9"



6, 7, 8
 rechap 06-08-84
 drive to water line 06-06-84

SCALE _____

PILE QUANTITY & DRIVING RECORD (DRIVEN PILES)

JOB STAMP
 05-SLO-1-52.7/53.4 05-276804(503)
 BR-F-P001(133) Nr Cambria, 0.2-mi S
 to 0.5-mi N of San Simeon Crk Br

DCSCTB (REV 8/81)

SHEET NO. 48

BRIDGE NO. 49-46

ITEM DESCRIPT FURNISH Pile Class 70C PILING

BRIDGE NAME SAN SIMEON CREEK BRIDGE TYPE PILE USED 12" Precast Prestressed

~~SET~~ OR BENT NO. BR-4 FTG _____ FTG TYPE _____ BOTTOM FTG ELEV. -5.25

HAMMER MAKE DELMAG MODEL 230 E= 54200

DESIGN BRNG. 70T REQUIRED BRNG. 70T BLOW/FT AT REQUIRED BRNG. 18

PILE DRIVING INSPECTED BY SINGER/INAGANI PILE QUANTITY CALC BY J. Sugar DATE _____

PILE CONCRETE PLACING INSP. BY _____ PILE QUANTITY CHECK BY _____ DATE _____

PILE NO	DATE PILE DRIVEN	BLOWS PER FOOT	DATE PILE CONCRETE PLACED	(1) SPEC. TOP OF PILE ELEV	(2) SPEC. TP ELEV.	(3) LENGTH IN LEADS	(4) LENGTH OF CUT OFF	(5) ACTUAL LENGTH IN GROUND (3-4)	(6) ACTUAL TP ELEV (1-5)	(7) PAY LENGTH * SEE NOTE BELOW	REMARKS	PRE DRILL HOLE DEPTH	LENGTH OF RE-BAR REQ.
1	6/8/84	27		-5.25	-65.00	60		60	64.75	60	7' Drop		
2	6-11-84	41									15'-8' Drop		
3	✓	30									7' Drop		
4	✓	32											
5	6-11-84	31											
6	6-11-84	28											
7	6-11-84	32											
8	6-8-84	14									Relap OK		
9	6-8-84	27						60		60			
10	6-11-84	R					2.0	58	62.75	58	150+ BPF		
11	6-11-84	R					3.0	57	61.75	57	200 +		
12	✓	80						60	64.75	60			
13	✓	60						60	64.75	60			
14	✓	50						60	64.75	60			
15	6-12-84	42					3.0	57	61.75	57	Pile spawling stopped ^{3' high}		
16	6-12-84	42						60		60			
17	6-8-84	27											
18	6-11-84	52											
19	✓	35									20' stop @ 1200		
20	✓	36									7' drop		
21	6-11-84	31											
22	6-11-84	27											
23	6-11-84	20											
24	6-3-84	12		-5.25	-65.00	60.0		60.0	61.75	60	Relap 44 BPF ± 1/2"		

SHEET TOTALS	ITEM NO. _____ EA.	ITEM NO. <u>24</u>	<u>1432</u> L.F.	FILE CATEGORY 48
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* THE PAY LENGTH IS THE ACTUAL LENGTH IN THE GROUND, EXCEPT THAT NO PAY WILL BE MADE FOR THAT LENGTH OF PILE DRIVEN BELOW THE ELEVATION WHERE SPECIFIED TP AND/OR SPECIFIED BEARING (WHICHEVER IS LOWER) WAS OBTAINED ALSO, WHEN STEEL PILES ARE SUBSTITUTED FOR CLASS 45 1
 AS 2 OR 70 PILING THE LOWER LIMIT FOR PAYMENT WILL BE NO LOWER THAN THE SPECIFIED TP ELEVATION

DEPARTMENT OF TRANSPORTATION
PILE LAYOUT SHEET
DH-OS C80 (REV. 11 73)

JOB STAMP

05-SLO-1-52.7/53.4 05-276804(503)
BRF-F-P001(133) Nr Cambria, 0.2-mi S
to 0.5-mi N of San Simeon Crk Br

Drawn By CHRIS FOSTER Date 4-10-84

Sheet No _____

Checked By _____ Date _____

Bridge No 49-46 Bridge Name SAN SIMEON CREEK BRIDGE

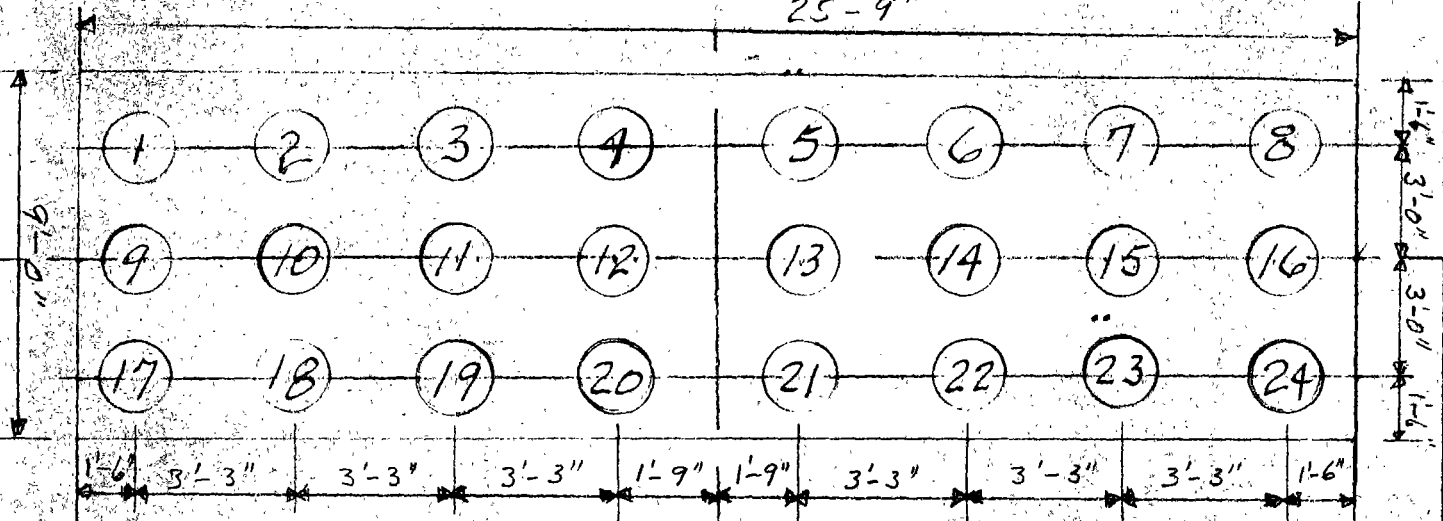
Abutment or Bent No P-4 Ftg _____

Ftg Type _____ Bot Ftg Elev _____



± SURVEY

25'-9"



SCALE _____

PILE QUANTITY & DRIVING RECORD (DRIVEN PILES)

JOB STAMP
 05-SLO-1-52.7/53.4 05-276804(503)
 BR-F-P001(133) Nr Cambria, 0.2-mi S
 to 0.5-mi N of San Simeon Crk Br

1085C78 (REV 8/81)

SHEET NO. 48

BRIDGE NO. 49-46

ITEM DESCRIPT Furnish Piling Class 90C PILING

BRIDGE NAME SAN SIMEON CREEK BRIDGE

TYPE PILE USED 12" Precast Prestressed Concrete

ABUT OR BENT NO. #1 FTG _____ FTG TYPE _____ BOTTOM FTG ELEV. 13.00

HAMMER MAKE Delmag MODEL D-30 E= 54200 - 23870

DESIGN BRNG. 70 T REQUIRED BRNG. 70 T BLOW/FT AT REQUIRED BRNG. 18

PILE DRIVING INSPECTED BY _____ PILE QUANTITY CALC BY T. Singer DATE _____

PILE CONCRETE PLACING INSP. BY _____ PILE QUANTITY CHECK BY _____ DATE _____

PILE NO.	DATE PILE DRIVEN	BLOWS PER FOOT	DATE PILE CONCRETE PLACED	(1) SPEC. TOP OF PILE ELEV.	(2) SPEC. TP ELEV.	(3) LENGTH IN LEADS	(4) LENGTH OF CUT-OFF	(5) ACTUAL LENGTH IN GROUND (3-4)	(6) ACTUAL TP ELEV (1-5)	(7) PAY LENGTH * SEE NOTE BELOW	REMARKS	PRE DRILL HOLE DEPTH	LENGTH OF RE-BAR REQ.
1	6-1	9		13.25	-60.00	73'	.	73	-59.75	73	Relap 4 RPI		
2	6-1	12				73'		73	-59.75	73	Relap 4 RPI		
3	6-1	9				73'		73	-59.75	73			
4	6-01-84	14				77'		77	-60	77	Battered		
5	6-01-84	13				77'		77	-60	77	Battered		
6	6-01-84	14				✓		77	✓	77	Battered		
7	6-01-84	18				✓		77	-60	77	3ab		
8	6-06-84	17		13.25	-60.00	83		83	-65.5	73.25	Battered 15" octagonal 70C Replacement for broken pile		
All piles accepted based on retest of 182													

SHEET TOTALS ITEM NO. _____ EA. ITEM NO. 24 600.25 L.F. FILE CATEGORY 48

* THE PAY LENGTH IS THE ACTUAL LENGTH IN THE GROUND, EXCEPT THAT NO PAY WILL BE MADE FOR THAT LENGTH OF PILE DRIVEN BELOW THE ELEVATION WHERE SPECIFIED TP AND/OR SPECIFIED BEARING (WHICHEVER IS LOWER) WAS OBTAINED. ALSO, WHEN STEEL PILES ARE SUBSTITUTED FOR CLASS 45-1, THE LOWER LIMIT FOR PAYMENT WILL BE NO LOWER THAN THE SPECIFIED TP ELEVATION.

DEPARTMENT OF TRANSPORTATION
PILE LAYOUT SHEET

DH-OS C80 (REV. 11-73)

JOB STAMP

05-SLO-1-52.7/53.4 05-276804(503)
BRF-F-P001(133) Nr Cambria, 0.2-mi S
to 0.5-mi N of San Simeon Crk Br

Drawn By C. FOSTER Date 4-10-84

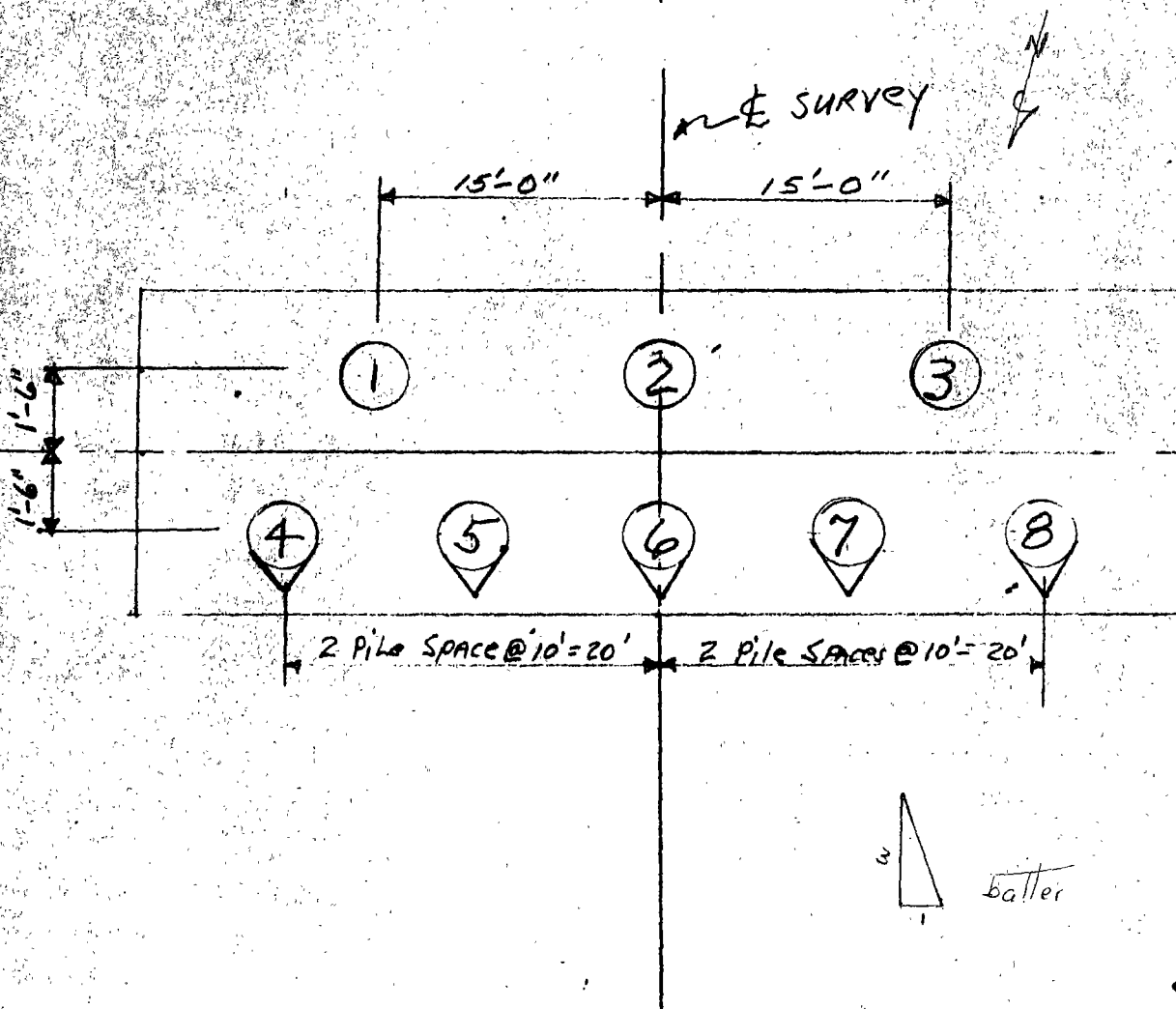
Sheet No _____

Checked By _____ Date _____

Bridge No 49-46 Bridge Name SAN SIMEON CREEK BRIDGE

Abutment or Bent No # 1 Ftg _____

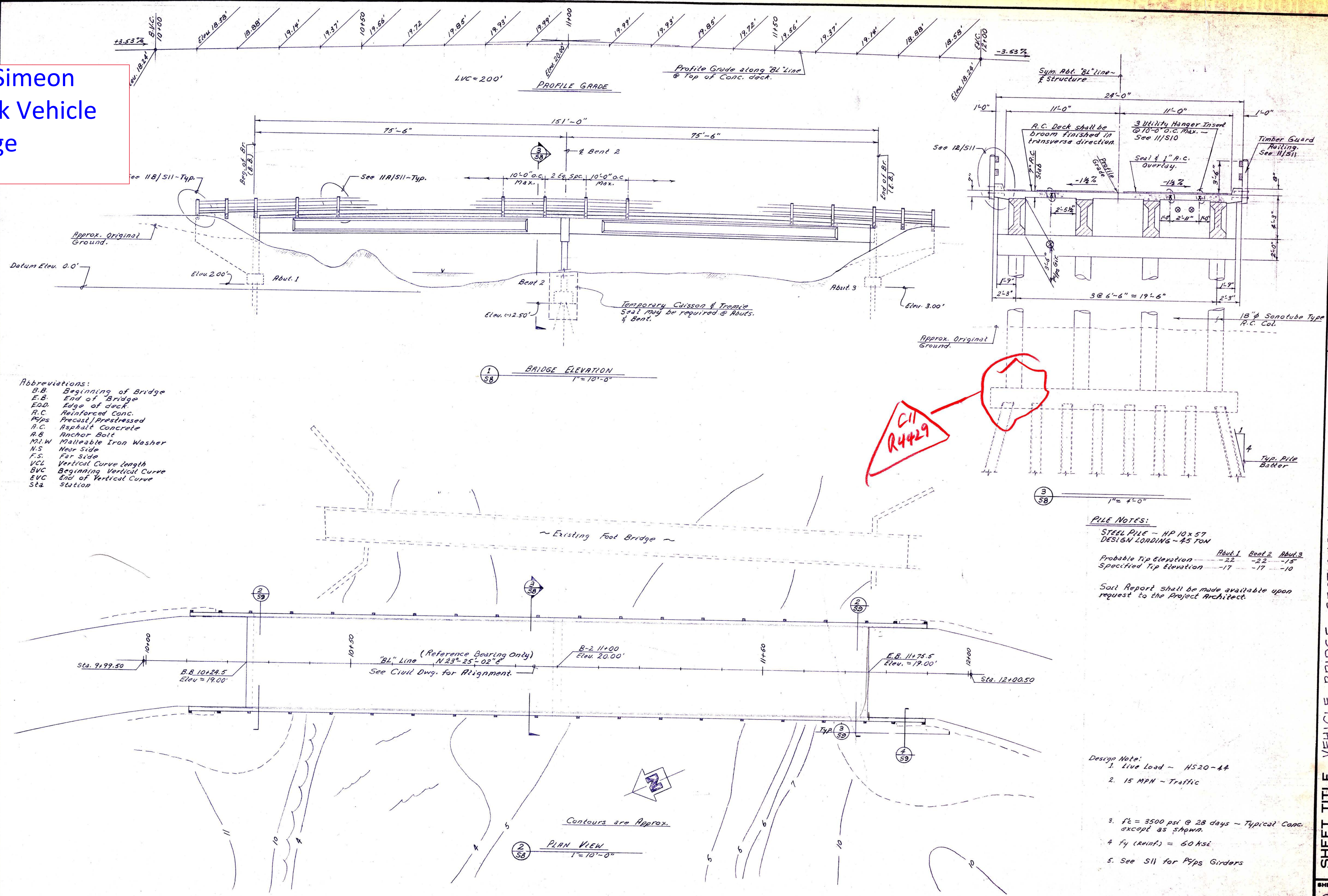
Ftg Type _____ Bot Ftg Elev 13.0



Brq. A-#

SCALE _____

San Simeon Creek Vehicle Bridge



- Abbreviations:**
- B.B. Beginning of Bridge
 - E.B. End of Bridge
 - E.O.D. Edge of Deck
 - R.C. Reinforced Conc.
 - P/ps Precast/Prestressed
 - A.C. Asphalt Concrete
 - A.B. Anchor Bolt
 - M.I.W. Malleable Iron Washer
 - N.S. Near Side
 - F.S. Far Side
 - V.C.L. Vertical Curve Length
 - B.V.C. Beginning Vertical Curve
 - E.V.C. End of Vertical Curve
 - Sta. Station

C11 R4429

- PILE NOTES:**
- STEEL PILE - HP 10x57
DESIGN LOADING - 45 TON
 - Probable Rip Elevation -22 -22 -15
 - Specified Rip Elevation -17 -17 -10
- Soil Report shall be made available upon request to the Project Architect.

- Design Note:**
- Live Load - HS20-44
 - 15 MPH - Traffic
 - f_c = 3500 psi @ 28 days - Typical Conc. except as shown.
 - f_y (reinf.) = 60 ksi
 - See S11 for P/ps Girders

Office of the State Architect

WHITSON W. COX F.A.I.A.
STATE ARCHITECT
Project Architect / PROJECT ENGINEER

PROJECT: CAMPING, DAY-USE & SEWER - PHASE II
CLIENT: DEPARTMENT OF PARKS & RECREATION
LOCATION: SAN SIMON STRIKE BEACH
STATE OF CALIFORNIA
DEPARTMENT OF GENERAL SERVICES

SHEET TITLE: VEHICLE BRIDGE SECTIONS AND DETAILS

SHEET NUMBER: 11

REVISIONS:	APPROVALS:	SUPERVISOR K.T. STRICKER	DESIGNED BY C.S. POKABE	DRAWN BY Charles S. Pokabe	CHECKED BY H. Ota	DATE	WORK ORDER NUMBER P38 11/01	FILE
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8-11-83	8-8-83	3-17-83
10-15-83	8-11-83	3-10-83
10-11-83	3-11-83	4-30-83





111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 108820.T06.WELL	BORING/WELL NUMBER MW-4
PROJECT NAME Cambria	DATE DRILLED March 12, 2015
LOCATION San Simeon Creek Rd	CASING TYPE/DIAMETER Schedule 40 PVC/4-inch
DRILLING METHOD Reverse Rotary	SCREEN TYPE/SLOT Schedule 40 PVC/ 0.020-inch
SAMPLING METHOD Modified California Split-Spoon	GRAVEL PACK TYPE No.3 Monterey Sand
GROUND ELEVATION (FT MSL)	GROUT TYPE/QUANTITY Portland Cement
TOP OF CASING (FT MSL)	DEPTH TO WATER (FT BGS) 8.30
LOGGED BY Hannah Erbele	GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		SILT: dark yellowish brown (10YR 4/4); 100% silt, very soft, non-plastic; trace gravel, maximum diameter is 1 inch, subangular, dry.		Concrete (0 to 2.5 ft bgs)
	1 2 1	24			5	SW		SAND: dark olive brown (2.5Y 3/3); 100% sand, medium, well sorted; trace gravel.	5.0	4" Sch 40 PVC blank casing (0 to 10 ft bgs)
						SM		SILTY SAND: dark grayish brown (2.5Y 3/3); 60% sand, fine; 40% silt, low plasticity.	6.0	Bentonite chips (2.5 to 9 ft bgs)
	5 6 7	24			10			GRAVEL WITH SAND: dark grayish brown (2.5Y 4/2); 80% gravel, fine to coarse, maximum diameter 3 inch; 20% sand, fine to coarse, poorly sorted.	10.0	4" Sch 40 PVC 0.020" slot screen (10 to 50 ft bgs)
	2 3 6	6			15	GP		GRAVEL WITH SAND: very dark grayish brown (2.5Y 3/2); 60% gravel, fine to coarse, maximum diameter 1 inch, poorly sorted, subrounded to rounded; 40% sand, fine to coarse, poorly sorted, subrounded to rounded.	20.0	#3 Sand (9 to 52 ft bgs)

NEWSINT_CAMBRIA.GPJ LAEWN01.GDT 9/15/15

Continued Next Page



111 Academy, Suite 150
Irvine, CA 92617
(949) 752-5452
(949) 752-3790 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 108820.TO6.WELL BORING/WELL NUMBER MW-4
PROJECT NAME Cambria DATE DRILLED March 12, 2015

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	3 5 5	12						SAND WITH GRAVEL: dark olive brown (2.5Y 3/2); 80% sand, fine to coarse, poorly sorted, rounded; 20% gravel, fine to coarse, maximum diameter 1.5 inch, poorly sorted, subrounded to rounded.		
						SP				
									24.0	
	3 3 7	24			25	GW		GRAVEL WITH SAND: olive (5Y 4/3); 85% gravel, fine to coarse, maximum diameter 3/4 inch, well sorted, subrounded to rounded; 15% sand, fine to coarse, poorly sorted.		
									26.0	
						SP		SAND WITH SILT AND GRAVEL: olive (5Y 4/3); 50% sand, fine to coarse, poorly sorted, subangular to subrounded; 40% gravel, fine to coarse, maximum diameter 1.25 inch, poorly sorted; 10% silt, no plasticity.		
									29.5	4" Sch 40 PVC 0.020" slot screen (10 to 50 ft bgs)
	5 10 15 18	24			30	GW		GRAVEL: very dark gray (5Y 3/1); 95% fine gravel, well sorted, rounded; 5% sand, coarse, subrounded to rounded.		
									31.0	
						GP		GRAVEL WITH SAND: olive gray (5Y 5/2); 80% gravel, fine to coarse, maximum diameter 2 inch, poorly sorted, subangular to rounded; 20% sand, fine to coarse, poorly sorted, subangular to subrounded.		
									35.0	
	3 4 10 12	14			35	GW		GRAVEL WITH SAND: olive (5Y 4/3); 85% gravel, fine to coarse, maximum diameter 2 inch, well sorted, subangular to rounded; 15% sand, fine to coarse, poorly sorted, subangular to subrounded.		
									40.0	
	2 3 9 9	9			40	GP		GRAVEL WITH SAND: olive (5Y 4/3); 50% gravel, fine to coarse, maximum diameter 2 inch, poorly sorted, subrounded to rounded; 50% sand, coarse, well sorted, subangular to rounded.		

NEWGINT_CAMBRIA.GPJ_LAEWIND1.GDT_9/15/15

Continued Next Page



111 Academy, Suite 150
Irvine, CA 92617
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 108820.TO6.WELL BORING/WELL NUMBER MW-4
PROJECT NAME Cambria DATE DRILLED March 12, 2015

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		24			45	GP		GRAVEL WITH SAND: olive (5Y 4/3); 50% gravel, fine to coarse, maximum diameter 2 inch, poorly sorted, subrounded to rounded; 50% sand, coarse, well sorted, subangular to rounded.	45.0	<p>#3 Sand (9 to 52 ft bgs)</p> <p>4" Sch 40 PVC 0.020" slot screen (10 to 50 ft bgs)</p>
		12			50	GP		GRAVEL WITH SAND: olive (5Y 4/3); 85% gravel, fine to coarse, maximum diameter 1 inch, poorly sorted, angular to rounded; 15% sand, medium to coarse, poorly sorted, subangular to subrounded.	50.0	
					51.5	ML		GRAVELLY SILT WITH SAND: dark greenish grey (GLEY1 4/1); 50% silt, low plasticity; 30% gravel, fine, poorly sorted, subangular to subrounded; 20% sand, fine to coarse, poorly sorted, subangular to subrounded; wet.	51.5	
					51.8	ML		SILT: 90% silt, low plasticity; 5% sand, fine; 5% wood, 1" wood chips; moist.	51.8	
					52.0			Total depth of borehole to 52 feet below ground surface (bgs).	52.0	

NEWSINT_CAMBRIA.GPJ_LAEWNN01.GDT_9/15/15

LONG-TERM WATER SUPPLY AND STORAGE ALTERNATIVES

DATE: January 29, 2024

TO: Cambria Community Services District Resources and Infrastructure Committee

FROM: Jim Webb
Mark Meeks
Derrick Williams

SUBJECT: Cambria Community Services Supplemental Water Supply Options

INTRODUCTION

The Supplemental Water Supply Ad-Hoc Committee is tasked with summarizing options that could provide supplemental or enhanced water supplies to the Cambria Community Services District. Three potential approaches for developing supplemental supplies were discussed at the December 12, 2023 Resources and Infrastructure Committee meeting:

1. Working with upstream water rights holders.
2. Installing atmospheric water generation panels
3. Using electromagnetics to look for water bearing sediments that could be tapped with new wells.

This memorandum summarizes these three options.

WORKING WITH UPSTREAM WATER RIGHTS HOLDERS AND UPSTREAM WATER RETENTION

OVERVIEW

Understanding and coordinating upstream water storage and water use could provide various benefits to the CCSD. Understanding upstream use informs demands on the local water system which could be incorporated into planning and management activities. Temporarily storing water in upstream ponds could provide extended aquifer recharge opportunities.

COORDINATING WITH UPSTREAM WATER RIGHTS HOLDERS

Coordinating with upstream water rights holders could improve demand management and has many potential benefits, key to which would be understanding patterns of use and anticipated use of local water supplies. The watersheds that supply Cambria offer a climate suitable to a wide

range of agricultural activities. Cattle, wine grapes, citrus, avocados, peas, apples and more are currently produced. Providing livestock water and irrigating these crops impacts the water available to the District. Without understanding the local demands on resources, water resource management becomes difficult.

Upstream water rights holders use water in ways that impact other users. In times of drought, it may be useful to know of any anticipated increase in use by upstream farms or ranches. Coordinated efforts may lessen drought impacts on stressed aquifers.

UPSTREAM WATER RETENTION

Slowing and extending the length of time local watersheds drain facilitates aquifer recharge. The more slowly water drains from the surrounding hills, the more time it has to soak in. The current climate regime appears to favor large rain events followed by the absence of rain. Creeks flood quickly in winter and techniques to reduce flooding and slow runoff could benefit recharge. Temporary storage of winter runoff, however, is not without challenges. A coordinated watershed wide response would be very difficult to achieve.

Two techniques for slowing runoff are possible. One technique is to slow overland flow, and can be thought of as roughing up the watershed. This would entail ensuring runoff must navigate rough terrain and a tortuous path. Roughing up the watershed would slow winter floods and allow greater recharge of aquifers.

The opposite of roughing up the watershed is the channelization of the watershed. When creeks meander through agricultural properties, they are often channelized to control erosion and allow for efficient use of arable land. This activity can accelerate water flow and not allow time for water to soak into aquifers. Examples can be seen at Perry Creek and Green Valley Creek near the Highway 1/Highway 46 intersection. The environmental benefits of a creek turned drainage ditch are limited.

A second technique is temporary storage of runoff in holding ponds. Runoff could be stored in ponds and slowly released to lengthen the time of aquifer recharge. An example area might be a rock quarry near the intersection of Highway 1 and Highway 46. This site has been extensively used for years, resulting in a large hollowed out mountain/hill. The opportunity to place infrastructure close to the nexus of channelized creeks is attractive, however having such installations out of the scenic Highway 1 corridor would be essential. This site was looked at as a potential storage area for water, but the faults and fissures in the rock did not lend the sit to water retention. Bedrock is exposed at this site, and this could support a tank or small tank farm.

ADVANTAGES AND DISADVANTAGES

Advantages of working with upstream areas include:

- Potentially low cost. Working with upstream water rights holders could have recharge benefits at low cost.
- Multiple benefits. Extending the period of streamflow for recharge would have both water supply and environmental benefits.

Disadvantages of working with upstream areas may include:

- Water rights may preclude water storage
- Landowners may not want to rough up land if it is not financially advantageous

SUGGESTED NEXT STEPS

The following activities could be undertaken if the District opts to further investigate working with upstream water rights holders.

- Legal analysis. The water rights issues associated with storing water, as well as liability issues, should be investigated.
- Approach upstream water rights holders regarding water storage. Additionally, estimate the cost of developing water retention facilities
- Approach upstream landowners regarding slowing runoff.

ATMOSPHERIC WATER GENERATION

OVERVIEW

Atmospheric water generation is a group of technologies that could directly provide CCSD with a new source of water. These systems extract moisture from the air and have been used in drought-stricken areas for many decades. Although atmospheric water generation is often associated with providing water to dry areas, many coastal areas throughout the world have water scarcity problems, and the high humidity conditions in these coastal areas makes atmospheric water generation plausible. Atmospheric water generation continues to advance, often using renewable energy to power their processes. Capacities range from home-based units that produce up to 20 liters a day to commercial systems that can generate up to 10,000 liters or more a day.

ATMOSPHERIC WATER GENERATION OPTIONS

Generally, these devices are categorized into two main groups. Active generation (AWG) and passive generation (PWG). PWG generation generally requires no external sources of energy. AWG generation requires external sources of energy.

Within these two groups 4 technologies are currently commonly used.

1. Fog nets (Passive)
2. Hydrophilic (Passive)
3. Thermo-Electric (Active)
4. Descendant (Active)

In both categories efficiency is the key component for optimal water generation and return on investment. Recent designs have enabled hybrid systems that use renewables as an energy source.

PASSIVE WATER GENERATION SYSTEMS

The most promising passive generation systems are newly developed desalination methods. Historically, desalination has been energy intensive and requires vast infrastructure for support, making them relatively inefficient. In most applications this inefficiency increases the cost and makes them financially infeasible.

The most efficient PWG desalination system has been developed by students at MIT and uses Thermally Localized Multistage Solar Still (TMSS) to convert water vapor to water at an efficiency rate of 385%. TMSS systems use sunlight as a heat source to evaporate a brine solution or seawater to recover clean distilled water. Because these systems use a renewable energy source, they are technically hybrid systems. They are included with PWG systems in this memorandum because they require no outside energy.

Research has not led to an “off the shelf” TMSS system and would need to be engineered to specific conditions and/or application. It is unclear if a brine effluent from a RO desalination plant could be used, but perhaps a system could be integrated with the existing Water Reclamation Facility.

ACTIVE WATER GENERATION SYSTEMS

AWG systems use external energy sources for heat and air circulation to produce water. The major drawback is the large amount of energy consumed by these systems and high operational costs.

There are four types of AWG's.

1. Refrigerant
2. Peltier
3. Desiccation
4. Hydrophilic

The first two require an outside electricity source. They fundamentally cool the air below the dew point, producing water. Peltier systems are very low in efficiency but require little maintenance.

Recent technologies have improved efficiencies for refrigerant AWG systems. Examples of efficiency for these devices are 3.22 liters of water per Kilowatt-hour (KWh) at 60% humidity and 80.6 degrees F. Integration with solar panels can eliminate external energy sources.

Although many companies produce AWGs, only a few have reached the level of 300 – 350 watt-hours of energy per liter of water. One such manufacturer, Source Global, produces an integrated panel that incorporates solar panels and condensation panels. Source Global claims they have powered up a water farm that can produce 400,000 gallons of water a year. One panel can produce 3-5 liters of drinking water a day or around 365 gallons a year. A single panel costs \$2,000. Economies of scale may be possible; however, a simple extrapolation means 1,095 panels to produce 400,000 gallons a year @ \$2,000 per panel = approx. \$2,191,000.

The third type of AWG is a thermo-desiccant system. The advantage of this type is they use a desiccant material to capture moisture from the air at night and then use sunlight during the day to heat the desiccant material to produce water. Only a small amount of energy supplied by solar panels is used to circulate hot air. It is claimed that 80 degrees Celsius (176 Fahrenheit) of hot air can produce 395 gallons per day per cubic meter of surface area at about 5 cents a liter and less at larger scales.

A newer and novel approach is WEDEW (Wood-to-Energy Deployable Water) Developed by Skysource, a California enterprise. It uses organic waste such as wood and compostable material to generate up to 2,000 liters a day. Wood or plant waste is placed in a shipping container where it decomposes producing biogas which is trapped in the container and then extracted from the humid air. This device won the 1.75-million Water Abundance XPRIZE in 2018 as the most feasible solution for addressing global water crisis. Costs were not available on their website.

ADVANTAGES AND DISADVANTAGES

Advantages of Atmospheric water generation include:

- Directly provides additional water. The other two approaches in this memorandum are studies or policies that don't directly result in new water sources.
- Low-energy consumption options, such as solar units, exist.

Disadvantages of Atmospheric water generation include:

- Limited water volume. The largest system, producing 10,000 liters per day, would produce only 3 acre-feet per year if operated every day.

SUGGESTED NEXT STEPS

Today there exists many options for atmospheric water generation. Costs depend on scale and efficiency. The following activities could be undertaken if the District opts to further investigate atmospheric water generation.

- Set a defined expectation and/or application for AWG
- Identify potential technologies that can meet the defined expectations
- Consult with an engineering firm familiar with these systems to provide preliminary costs and designs

GEOPHYSICAL AQUIFER MAPPING

OVERVIEW

Electromagnetic geophysical methods have recently gained popularity as tools for mapping aquifers in California and may help the District locate productive portions of local aquifers. This technology could identify areas where the District might expand its wellfields to provide additional supply.

Two related electromagnetic geophysical tools are Airborne Electromagnetics (AEM) and towed Time-Domain Electromagnetic (tTEM). Both systems work by towing an instrument that sends electrical impulses into the ground. The electromagnetic response to these electrical impulses allows the tools to measure the resistivity of the subsurface materials. The resistivity can be used to infer the type of subsurface material: highly resistive sediments generally contain more sand (aquifers), and highly conductive material generally contain more clays (aquitards). The process has been compared to taking an MRI of the subsurface.

AIRBORNE ELECTROMAGNETICS

AEM is used to cover large areas – usually with coarser spatial coverage. AEM uses a wire loop suspended below a helicopter to transmit the electrical signals (Figure 1). The helicopter flies along closely spaced parallel lines to map the subsurface. Depending on the tool used and local conditions, AEM can map the resistivity of sediments to a depth of approximately 1,000 feet. Example results from an AEM survey in Paso Robles are shown on Figure 2.

TOWED TIME-DOMAIN ELECTROMAGNETICS

tTEM covers smaller areas – usually with finer spatial coverage. tTEM tows a sled across the ground to transmit the electrical signals (Figure 3). Depending on the tool used and local conditions, tTEM can map the resistivity of sediments to a depth of between 200 and 300 feet. Example results from a tTEM survey in a Tulare orchard are shown on Figure 4. Blue areas on this figure are clays, red areas on this figure are sands.

EXAMPLE COMPARISON OF AEM AND tTEM

A comparison of one example AEM survey and one example tTEM survey is shown in Table 1. This comparison is presented to clarify the different scales of the two techniques.

Table 1. Comparison of Example AEM and tTEM Surveys

Technology/Tool	AEM ¹	tTEM ²
Location	Paso Robles	Tulare Almond Orchard
Year	2019	2020
Horizontal measurement spacing	1,640 feet	22 feet
Area covered	290 square miles	14 acres
Depth of investigation	1,500 feet	200 feet

All numbers are approximate

¹Ramboll, 2020

²Goebel and Knight, 2021

GEOLOGIC DATA NEEDS

Both AEM and tTEM provide resistivity data of the subsurface. Additional geologic data are needed to convert the resistivity data into a geologic interpretation. This is done by comparing the resistivity data to data from either well logs or cone penetrometer (CPT) data. If the area covered by the AEM or tTEM surveys do not have existing geologic data, boreholes will need to be drilled or CPT data will need to be collected. If there is no need for a new well, CPT data will generally be less expensive to collect.

SUGGESTED NEXT STEPS

The following activities could be undertaken if the District opts to further investigate electromagnetic aquifer mapping.

- Identify areas to be mapped.
- Assess whether AEM or tTEM are appropriate for the areas to be mapped. The relatively shallow aquifers around Cambria suggest that tTEM will likely be the appropriate technology
- Gather any existing geologic data about the areas to be mapped. This may include well logs or geotechnical investigations.
- Obtain cost estimates from contractors for operating and interpreting the electromagnetic data
- Obtain cost estimates from contractors for acquiring additional geologic data. This will likely be CPT data.

REFERENCES

ASME.org

Goebel, M, and R. Knight, 2021. *Recharge site assessment through the integration of surface geophysics and cone penetrometer testing*

Ramboll, 2020. *Hydrogeologic conceptual model in paso robles, traditional HCM*, prepared for the Stanford Groundwater Architecture project (GAP).

RSC Publishing

Synergy Files.com

“Theengineer”.co.uk



Figure 1. AEM Equipment

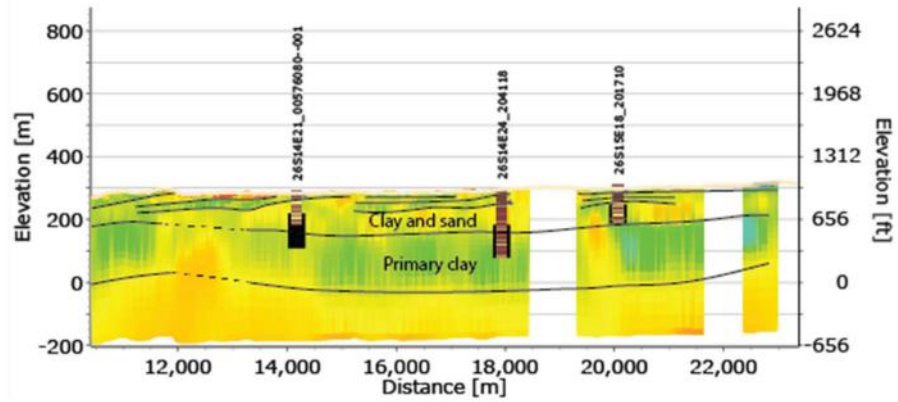


Figure 2. Example AEM Results from Paso Robles



Figure 3. Example tTEM Equipment in Tulare

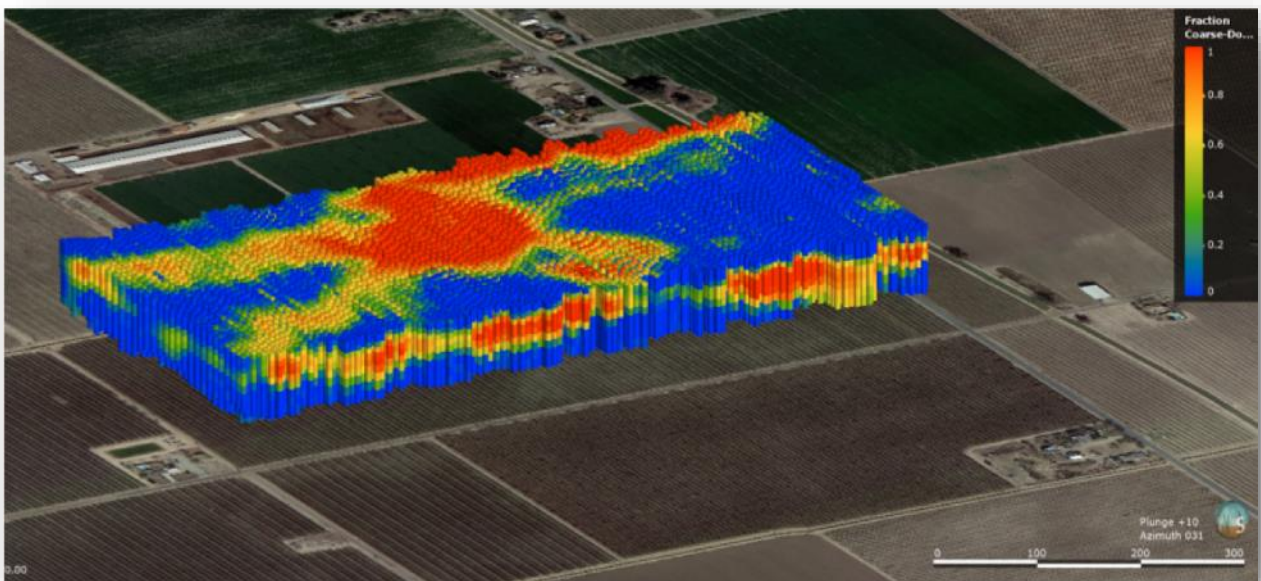


Figure 4. Example tTEM results in Tulare