ENGINEERING/OPERATIONAL COMMITTEE MEETING AGENDA
TRABUCO CANYON WATER DISTRICT
32003 DOVE CANYON DRIVE, TRABUCO CANYON, CA
VIDEO/AUDIO BROADCAST MEETING
OCTOBER 7, 2020 AT 7:00 AM

COMMITTEE MEMBERS
Edward Mandich, Committee Chair
Stephen Dopudja, Committee Member
Don Chadd, Committee Member Alternate

DISTRICT STAFF
Fernando Paludi, General Manager
Michael Perea, District Secretary
Lorrie Lausten, District Engineer
Gary Kessler, Water System Superintendent
Jason Stroud, Maintenance Superintendent

AGENDA NOTE:
*Due to the spread of COVID-19 and as authorized by the Governor's Executive Order, Trabuco Canyon Water District will be holding this Engineering/Operational Committee Meeting by video broadcast (**Go To Meeting**), and will be available by either video conference or telephone audio as follows:*

***Video Conferencing:** You can join the meeting from your computer, tablet, or smartphone by clicking on the following link: https://global.gotomeeting.com/join/597863693*

Telephone Audio: *1 866 899 4679 (Toll Free)*
Access Code: *597-863-693*

*Persons desiring to monitor the Committee meeting agenda items may download the agenda and documents on the internet at **www.tcwd.ca.gov**.*

*You may submit public comments by email to the Board at **mperea@tcwd.ca.gov**. In order to be part of the record, emailed comments on meeting agenda items must be received by the District, at the referenced e-mail address, not later than 7:00 a.m. (PDT) on the day of the meeting.*

CALL MEETING TO ORDER

VISITOR PARTICIPATION
*Members of the public wishing to address the Board regarding a particular item on the agenda are requested to submit public comments by email to the Board at **mperea@tcwd.ca.gov**. The Board President will call on the visitor following the Board's discussion about the matter. Members of the public will be given the opportunity to speak prior to the Board taking action on that item. For persons desiring to make verbal comments and utilizing a translator to present their comments into English reasonable time accommodations, consistent with State law, shall be provided. Please limit comments to three minutes.*

ORAL COMMUNICATION
*Members of the public who wish to make comment on matters not appearing on the agenda are requested to submit oral communication by email to the Board at **mperea@tcwd.ca.gov**. Under the requirements of State Law, Directors cannot take action on items not identified on the agenda and will not make decisions on such matters. The Board President may direct District Staff to follow up on issues as may be deemed appropriate. For persons desiring to make verbal comments and utilizing a translator to present their comments into English reasonable time accommodations, consistent with State law, shall be provided. Please limit comments to three minutes.*

COMMITTEE MEMBER COMMENTS

REPORT FROM THE GENERAL MANAGER

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING AGENDA | OCTOBER 7, 2020

ADMINISTRATIVE MATTERS

PRESENTER(S): FERNANDO PALUDI, GENERAL MANAGER
MICHAEL PEREA, DISTRICT SECRETARY

ITEM 1: ENGINEERING/OPERATIONAL COMMITTEE MEETING RECAP

RECOMMENDED ACTION:
Approve the following Engineering/Operational Committee Meeting Recap(s) and recommend that the Board receive and file same (Consent Calendar).

1. *September 2, 2020*

ENGINEERING MATTERS

PRESENTER(S): FERNANDO PALUDI, GENERAL MANAGER
MICHAEL PEREA, ASSISTANT GENERAL MANAGER
LORRIE LAUSTEN, DISTRICT ENGINEER

ITEM 2: BELL CANYON SEWER LIFT STATION REHABILITATION PROJECT

RECOMMENDED ACTION:
Committee to receive information at the time of the Committee Meeting.

ITEM 3: DISCUSSION AND POSSIBLE ACTION(S) CONCERNING TRABUCO CANYON WATER DISTRICT'S SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM UPGRADE PROJECT

RECOMMENDED ACTION:
Recommend the Board of Directors authorize the General Manager to execute a contract for the Fiscal Year 2020-2021 SCADA Upgrades to TESCO Controls, Inc. in the not to exceed amount of $580,120 (Action Calendar).

ITEM 4: DISCUSSION AND POSSIBLE ACTION(S) RELATED TO THE PROPOSED PALOMA SQUARE DEVELOPMENT (DOVE CANYON PLAZA) AND OTHER RELATED MATTERS

RECOMMENDED ACTION:
Recommend the Board of Directors authorize the General Manager to execute the Assumption and Assignment of Contract from Albert Grover and Associates to AGA Engineers, Inc. (Action Calendar).

ITEM 5: SADDLEBACK MEADOWS DEVELOPMENT (181 DU's) – HARRIS GRADE RESERVOIR FEASIBILITY STUDY DRAFT REPORT

RECOMMENDED ACTION:
Committee to receive information at the time of the Committee Meeting.

ITEM 6: SKYRIDGE BY LENNAR HOMES OF CALIFORNIA, INC. – ACCEPTANCE OF WATER, NON-DOMESTIC WATER, AND SEWER FACILITIES CONSTRUCTED IN TRACT NO. 17392 AND OFFSITE IMPROVEMENTS

RECOMMENDED ACTION:

1. *Committee to receive information at the time of the Committee Meeting.*
2. *Recommend the Board of Directors accept water, non-domestic water, and sewer facilities constructed in Tract No. 17392 and Off-Site Improvements (Skyridge by Lennar Homes of California) by resolution (Action Calendar).*

ITEM 7: OTHER ENGINEERING AND OPERATIONS PROJECT UPDATES

1. The Oaks at Trabuco Development
2. Calendar Year 2019 Water Loss Audit
3. Cell Site Management Agreement
4. Trabuco Creek Bridge Rehabilitation Project
5. Silvertree Lane Pipeline Replacement
6. Other Projects

RECOMMENDED ACTION:

Committee to receive project status update at time of the Committee Meeting.

ITEM 8: DISCUSSION CONCERNING CALIFORNIA AIR RESOURCES BOARD (CARB) TRUCK REGULATIONS, COMPLIANCE, AND REPORTING SYSTEM IMPACTS TO DISTRICT HEAVY-DUTY FLEET VEHICLES

RECOMMENDED ACTION:

Committee to receive information at the time of the Committee Meeting. No action required.

OPERATIONAL MATTERS

PRESENTER(S): GARY KESSLER, WATER SYSTEM SUPERINTENDENT
MICHAEL PEREA, ASSISTANT GENERAL MANAGER
JASON STROUD, MAINTENANCE DEPARTMENT SUPERINTENDENT

ITEM 9: WATER SYSTEM UPDATES

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

ITEM 10: WASTEWATER SYSTEM UPDATES

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

ITEM 11: MAINTENANCE DEPARTMENT UPDATES

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

REGULATORY AND OTHER MATTERS

ITEM 12: OTHER MATTERS/REPORTS

RECOMMENDED ACTION:
Hear Other Matters/Reports that may have arisen after the posting of the agenda.

ADJOURNMENT

AVAILABILITY OF AGENDA MATERIALS

Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the Trabuco Canyon Water District Board of Directors in connection with a matter subject to discussion or consideration at an open meeting of the Board of Directors are available for public inspection at the Trabuco Canyon Water District Administrative Facility, 32003 Dove Canyon Drive, Trabuco Canyon, California (District Administrative Facility) or will be posted online on the District's website located at www.tcwd.ca.gov. If such writings are distributed to members of the Board less than 72 hours prior to the meeting, they will be available online at www.tcwd.ca.gov at the same time as they are distributed to the Board Members, except that, if such writings are distributed immediately prior to or during the meeting, they will be posted online on the District's website located at www.tcwd.ca.gov.

COMPLIANCE WITH THE REQUIREMENTS OF CALIFORNIA GOVERNMENT CODE SECTION 54954.2

In compliance with California law and the Americans with Disabilities Act, if you need special disability-related modifications or accommodations, including auxiliary aids or services in order to participate in the meeting, or if you need the agenda provided in an alternative format, please contact the District Secretary at (949) 858-0277, at least 48 hours in advance of the scheduled Board meeting. Notification at least 48 hours prior to the meeting will assist the District in making reasonable arrangements to accommodate your request. The Board Meeting Room is wheelchair accessible.

The District may conduct future meetings electronically (via teleconferencing) during the current ongoing emergency situation.

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ADMINISTRATIVE MATTERS
ITEM 1: ENGINEERING/OPERATIONAL COMMITTEE MEETING RECAP

RECOMMENDED ACTION:
Approve the following Engineering/Operational Committee Meeting Recap(s) and recommend that the Board receive and file same (Consent Calendar):

1. *September 2, 2020*

CONTACTS (staff responsible): PALUDI/PEREA

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING RECAP | SEPTEMBER 2, 2020

DIRECTORS PRESENT
Stephen Dopudja, Committee Member
Don Chadd, Committee Member Alternate

DIRECTORS ABSENT
Ed Mandich, Committee Chair

STAFF PRESENT
Fernando Paludi, General Manager
Michael Perea, Assistant General Manager/District Secretary
Lorrie Lausten, District Engineer
Gary Kessler, Water Department Superintendent
Jason Stroud, Maintenance Department Superintendent
Karen Warner, Senior Accountant
Lisa Sangi, Administrative Assistant

PUBLIC PRESENT
None

PUBLIC VIA CONFERNECE CALL
Mark Bush, Principal in Charge - Tetra Tech
Kyle Bohn, Project Manager - Tetra Tech

CALL MEETING TO ORDER
Director Dopudja called the September 2, 2020 Engineering/Operational Committee Meeting to order at 7:00 AM. Public access to the meeting was made available by video broadcast.

VISITOR PARTICIPATION
No comments were received.

ORAL COMMUNICATION
No comments were received.

COMMITTEE MEMBER COMMENTS
None

REPORT FROM THE GENERAL MANAGER
Mr. Paludi recommended removing item no. 2 from the agenda as it was not necessary for discussion.

ITEM 1: ENGINEERING/OPERATIONAL COMMITTEE MEETING RECAP

Mr. Paludi presented the Engineering/Operational Committee Meeting Recap for Committee review in accordance with the agenda.

RECOMMENDED ACTION

Director Dopudja and Mr. Perea recommended that the Engineering/Operational Committee Meeting Recap be forwarded to the Board of Directors for approval (Consent Calendar).

ITEM 3: DISCUSSION CONCERNING THE ADOPTION OF SOUTH ORANGE COUNTY WASTEWATER AUTHORITY (SOCWA) PROPOSED WASTE DISCHARGE PRETREATMENT AND SOURCE CONTROL PROGRAM FOR WASTEWATER FLOWS UPDATE AND ENFORCEMENT RESPONSE PLAN UPDATE

Mr. Paludi introduced this matter for Committee consideration and review. Mr. Perea provided a brief summary of the proposed minor updates to the Waste Discharge Pretreatment and Source Control Program (Ordinance) as prepared by the South Orange County Wastewater Authority (SOCWA) for member agencies, and he reviewed the notification and posting requirements in accordance with the Water Code. Mr. Perea added that District staff recommends scheduling the Public Hearing for the adoption of the Ordinance in November to allow SOCWA-member agencies that are cities to meet the additional reading requirements.

RECOMMENDED ACTION:

The Committee recommended the Board of Directors agendize Public Hearing and authorize District staff to furnish Notice of Public Hearing and Notice of Intention of adoption of Ordinance No. 2020-21 for the November 18, 2020 Regular Board Meeting (Action Calendar).

ITEM 4: 2020 UPDATE TO THE ORANGE COUNTY OPERATIONAL AREA AGREEMENT OF THE COUNTY OF ORANGE AND POLITICAL SUBDIVISIONS

Mr. Paludi presented this matter for Committee consideration and review, and he provided background on this matter for Committee review. Mr. Paludi reported to the Committee that the Operational Area (OA) Agreement is required to be adopted by cities and agencies within each individual jurisdiction, which includes the District, and he added that the Orange County Board of Supervisors approved the OA Agreement on March 24, 2020. The Committee inquired on the status of District Legal Counsel review of the OA Agreement; Mr. Paludi reported that legal counsel reviewed the proposed OA Agreement earlier in the year.

RECOMMENDED ACTION:

The Committee recommended the Board of Directors authorize Trabuco Canyon Water District to sign the 2020 Orange County Operational Area Agreement (Action Calendar).

ITEM 5: APPLICATION FOR THE U.S. BUREAU OF RECLAMATION'S WATERSMART GRANTS PROGRAM FOR AN ADVANCED METERING INFRASTRUCTURE (AMI) IMPLEMENTATION PROJECT

Mr. Paludi presented this matter for Committee review, and he provided a brief review of District staff efforts to date identifying certain grant funding opportunities for District projects. Mr. Paludi reported that District staff has worked with Soto Resources to assist with the preparation of the proposed application for the U.S. Bureau of Reclamation (USBR) WaterSmart Grant Program. Mr. Perea provided a brief review of the grant application process and funding groups, and he identified areas of cost savings through the implementation of an AMR/AMI metering system. Mr. Paludi added that USBR requires the governing board of the applicant agency to adopt a resolution in support of the project. Discussion occurred concerning the types of meters currently integrated in the District's service area and customer access to metering data.

RECOMMENDED ACTION:

The Committee recommended the Board of Directors adopt Resolution No. 2020-1283 – Resolution of the Board of Directors of the Trabuco Canyon Water District Authorizing the Submittal of an Application for the WaterSMART: Water and Energy Efficiency Grants for 2020 and 2021 (Action Calendar).

ITEM 6: SADDLEBACK MEADOWS DEVELOPMENT (181 DU's) – HARRIS GRADE RESERVOIR FEASIBILITY STUDY DRAFT REPORT

Mr. Paludi presented this matter for Committee review. Ms. Lausten provided an update on this development-related matter, and she commented that Mr. Bush and Mr. Bohn were in attendance to review the DRAFT Harris Grade Reservoir Feasibility Report with the Committee and to answer any related questions. Discussion occurred concerning potential construction challenges and associated costs and project impacts. Director Dopudja commented on the design of the proposed 2-million-gallon tank option. Director Chadd asked if there was a compelling reason for the project due to the known access and environmental constraints, as well as high-fire zone issues. Discussion occurred concerning the evaluation of alternative suitable locations for a reservoir. The Committee recommended that District staff evaluate the feasibility of constructing a reservoir on the District's Porter Property and to bring the matter back to the Committee for review.

RECOMMENDED ACTION:

There was no action taken on this matter.

ITEM 7: OTHER ENGINEERING AND OPERATIONS PROJECTS

1. District Asset Management

Mr. Paludi reported that the current contract for consultant services for this matter had been suspended. Discussion occurred concerning the District's existing Computerized Maintenance Management System (CMMS) for monitoring District assets, including equipment and facilities.

2. The Oaks at Trabuco Development

Mr. Paludi provided a brief update concerning this matter, and he mentioned that District staff will be meeting with the developer concerning the renewal of the existing sludge hauling agreement. Discussion occurred concerning District staff concerns with the onsite wastewater treatment facility and ongoing operational costs.

3. SWRCB and PFAS Sampling

Mr. Paludi introduced this matter for informational purposes. Ms. Lausten provided brief review of the State Water Resources Control Board (SWRCB) regulatory updates related to PFAS sampling, and she reported that the District is required to complete this sampling during the fourth quarter of 2020, and then on a quarterly basis, for the Robinson Ranch Wastewater Treatment Plant influent sewage. Ms. Lausten added that the associated testing costs are anticipated to be approximately $3200 per month.

4. Santiago Canyon Road Improvements

Ms. Lausten provided a brief update and project overview on this Orange County Public Works (OCPW) project impacting certain portions of the District's service area.

5. Other Projects

None.

RECOMMENDED ACTION

Committee to receive project status updates at time of the Committee Meeting.

ITEM 8: WATER SYSTEM UPDATES

Mr. Kessler reviewed the projects and repairs for August 2020, and he provided the additional highlights:

1. Water Operations staff worked with TESCO Controls to put Ridgeline Pump Station into normal operation and restarted Dimension Water Treatment Plant
2. Water Operations staff worked with the Meter Department to replace four, two-inch meters in the Santiago Estates Community.
3. Water Operations staff shut down the Trabuco Creek Ground Water Treatment Facility for 2020.
4. Water Operations staff flushed 66 hydrants in the Robinson Ranch Community.
5. Water Operations staff assisted the Meter Department and repaired a one-inch service on Mountain Laurel in the Dove Canyon Community.

Mr. Kessler reviewed the Monthly Water System Operations Summary with the Committee. Mr. Paludi reported that District staff met with Santiago Canyon Estates Community Homeowner Association representatives and Property Manager concerning certain possible irrigation system failures and leaks, as well as, providing account adjustments in accordance with District policy and water use efficiency rebate information.

RECOMMENDED ACTION

The Committee received the status update.

ITEM 9: WASTEWATER SYSTEM UPDATES

Mr. Perea reviewed the projects and repairs for August 2020, and he provided the additional highlights:

1. Wastewater Operations staff worked with TESCO Controls on the Dove Recycled Water Pump Station start up, including meeting virtually to review the equipment programming and controls.
2. Wastewater Operations staff work Southern California Edison (SCE) to provide temporary power at the Robinson Ranch Wastewater Treatment Plant (WWTP) during an unplanned emergency power outage due to SCE infrastructure failure.
3. Wastewater Operations standby staff responded to an unnoticed SCE Rolling Blackout event on Friday, August 14th.
4. Wastewater Operations staff worked with Solar Bee to perform the annual maintenance of the Dove Lake mixers.
5. Wastewater Operations staff worked with Maintenance Department staff to clean up Dove Lake after a minor turnover event.

Mr. Perea reviewed the Monthly Wastewater System Operations Summary with the Committee. Mr. Perea briefly reviewed the changes to the recycled water report consistent with the District's Non-Domestic Water Allocation Policy. Discussion occurred concerning the dry season recovery facilities.

RECOMMENDED ACTION

The Committee received the status update. There was no action taken.

ITEM 10: MAINTENANCE DEPARTMENT UPDATES

Mr. Stroud reviewed the projects and repairs for August 2020, and he provided the additional highlights:

1. Maintenance Department staff conducted Belt Press repairs, piping leaks, polymer system repairs, wash water pump coupling repair, along with the flow control valve upgrade.
2. Maintenance Department staff assisted with the blower room WAS pump rehab project, which is half-way complete, and installed new isolation valves
3. Maintenance Department staff worked with Hydrotech Electric to clean and repair damaged electrical lines, general vault repair, and prepping to remove the old Wastewater Operations electrical control panel.
4. Maintenance Department staff assisted Hydrotech Electrical on prepping to RNR old MCC panel for the Belt Press.
5. Maintenance Department staff procured and was able to test drive the new Ford F-650 dump truck to replace the current Kenworth dump truck.
6. Maintenance Department staff prepared vehicles and equipment for auction.
7. Maintenance Department staff prepared for the scheduled power outage at Robinson Ranch Wastewater Treatment Plant and SCE completed the required underground repair on the Wastewater Treatment Plant access road.
8. Maintenance Department staff continued to work and conduct testing at Dove Reclaim Booster Pump Station.
9. Maintenance Department staff assisted the Domestic Water Department at Topanga Booster Pump Station with hydro-tank operations

Mr. Paludi mentioned the vehicle report will be provided to the Finance/Audit Committee.

RECOMMENDED ACTION

The Committee received the status update. There was no action taken.

ITEM 11: OTHER MATTERS/REPORTS

There were no other matters or reports provided to the Committee.

RECOMMENDED ACTION

There was no action taken.

ADJOURNMENT

Director Dopudja adjourned the September 2, 2020 Engineering/Operational Committee Meeting at 8:36 AM.

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS
ITEM 2: BELL CANYON SEWER LIFT STATION REHABILITATION PROJECT

Trabuco Canyon Water District (District) owns and operates the Bell Canyon Lift Station (Station) in the Dove Canyon community. The station was built in the late 1980's as part of the Dove Canyon Development and is located at the end of Bell Canyon Drive. The station lifts sewage from 130 homes via a 4" PVC force main, 4500 LF to a manhole at the intersection of Willowglade and Golf Ridge Dr., which then gravity flows to Golf Club Lift Station.

The station footprint is 30'x15' and includes a wet well with two sets of submersible pumps working in series, a dry pit/valve vault, electrical/MCC panel, a chlorine tank and a backup diesel generator. On September 2, 2019, a complete failure of the station occurred and required Wastewater Operations and Maintenance Staff to install an emergency bypass system to prevent a Sanitary Sewer Overflow (SSO). Two days later, operations were able to restore service to one set of pumps, removed the bypass system and installed a temporary pumping system to back up the operational pumps.

District staff, along with JIG Consultants, identified areas that required rehabilitation and replacement, and completed a bid package for this work in April 2020. At the May 20, 2020 Regular Board Meeting, the Board of Directors authorized the General Manager to execute a contract with Ferreira Construction for the Bell Canyon Lift Station Rehabilitation in the amount of $1,496,228. At the June 15, 2020 Regular Board Meeting, the Board of Directors authorized the General Manager to execute a contract with Butier Engineering, Inc. for Construction Management Services in the amount of $180,830.

The original construction completion date was December 2020; however, submittals and equipment procurement have been significantly affected by shutdowns due to the coronavirus, pushing the completion date to May 2021 (Exhibit 1). The following is the budget for the project:

BELL CANYON LIFT STATION REHABILITATION PROJECT		
ITEM	**TASK DESCRIPTION**	**BUDGET**
1	Construction – Ferreira Construction (Includes $75,000 Allowance for Field Orders and $75,000 Approved Contingency)	**$1,571,228**
	• *Fence Revision*	*$12,468.00*
	• *Wet Well Replacement*	*$52,952.93*
	• *By-Pass Valve Relocation*	*$5,369.67*
	Total	*$70,790.60*
2	Geotechnical Site Investigation, Vibration Monitoring, Video Survey, Additional Boring - GMU Geotechnical	***$17,300.00**
3	Engineering Design/Services During Construction – JIG Consultants	**$99,825.00**
4	Construction Management/Inspection-Butier	**$180,830.00**
5	Site Survey – DMc Engineering	**$5,280.00**
6	Easement Procurement - DMc Engineering/CPSI Right-of-Way Services	***$4,000.00**
7	Service/Meter Plan/Arc Flash Study - SCE	***$3,000.00**
	Total:	**$1,881,463.00**

**Estimated*

TRABUCO CANYON WATER DISTRICT
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FUNDING SOURCE:
Emergency Reserves

FISCAL IMPACT
$1,880,000.00 (FY19-20 & FY20-21)

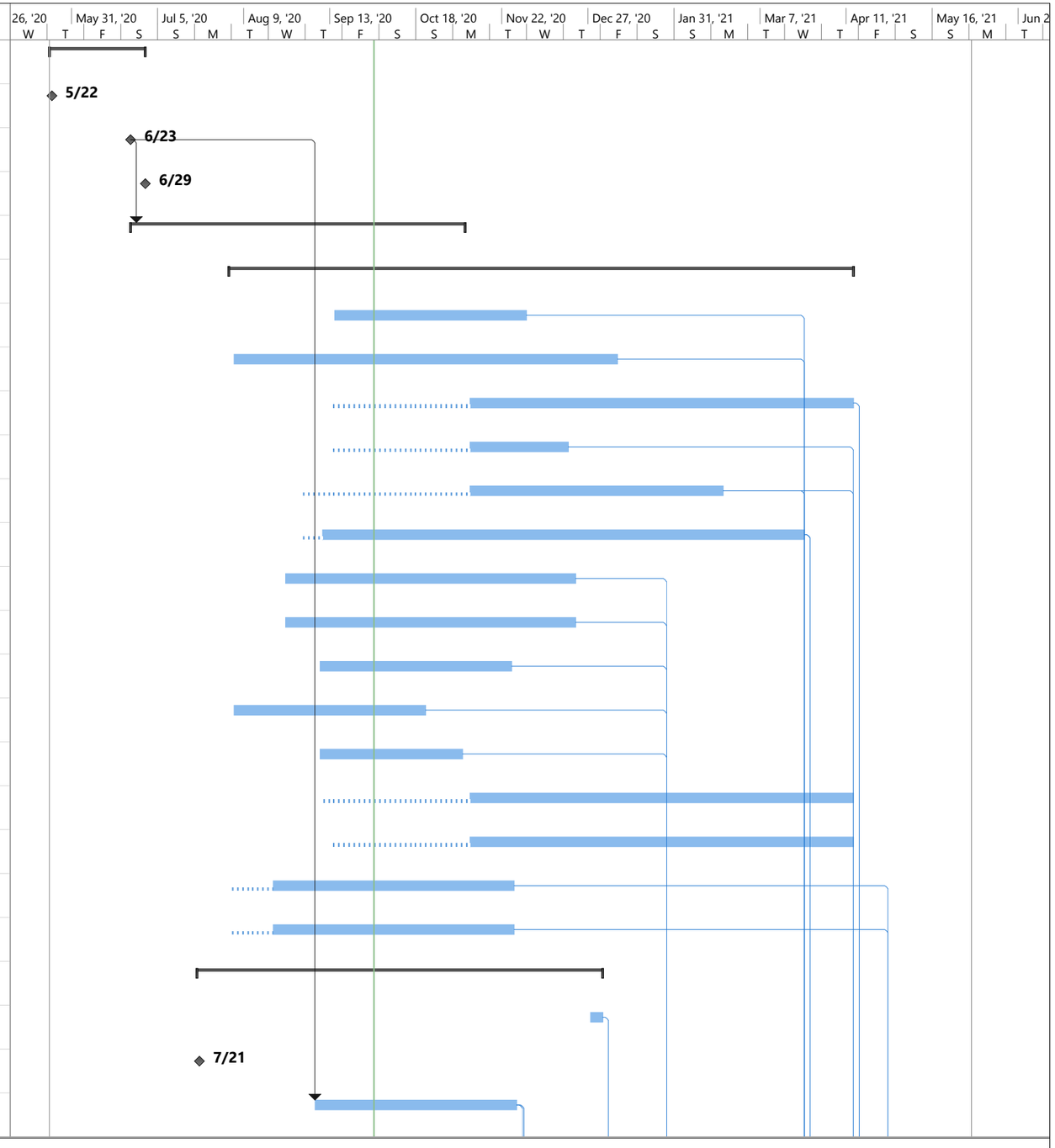
ENVIRONMENTAL COMPLIANCE:
Notice of Exemption was filed with the County of Orange on June 16, 2020

RECOMMENDED ACTION(S):
Committee to receive information at time of the Committee Meeting.

EXHIBIT(S):
1. Project Schedule-**UPDATED**

CONTACTS (staff responsible): PALUDI/LAUSTEN

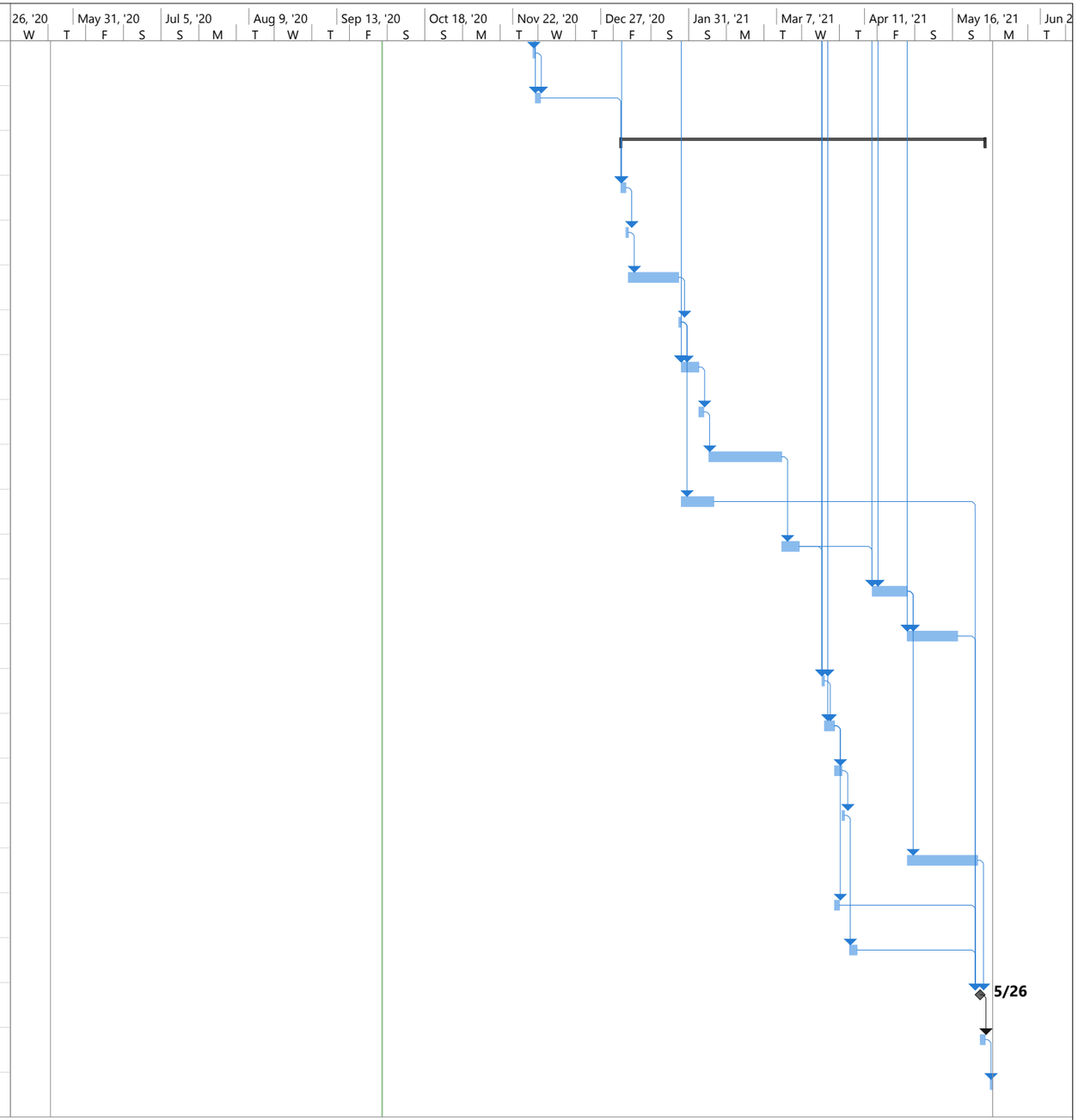
ID	Task Mode	Task Name	Duration	Start	Finish
1		**Project Setup**	**27 days**	**Fri 5/22/20**	**Mon 6/29/20**
2		Notice to Award	1 day	Fri 5/22/20	Fri 5/22/20
3		Pre-Construction Meeting	1 day	Tue 6/23/20	Tue 6/23/20
4		NTP	1 day	Mon 6/29/20	Mon 6/29/20
5		**Submittals**	**98 days**	**Wed 6/24/20**	**Fri 11/6/20**
69		**Material Procurement (Long Lead Items)**	**182 days**	**Mon 8/3/20**	**Tue 4/13/21**
70		Chemical Feed Unit	56 days	Tue 9/15/20	Tue 12/1/20
71		Bladder Surge Tank	112 days	Wed 8/5/20	Thu 1/7/21
72		Tesco Motor Control Center	112 days	Mon 9/14/20	Tue 4/13/21
73		Tesco Switch Board	30 days	Mon 9/14/20	Fri 12/18/20
74		ASCO ATS	75 days	Tue 9/1/20	Fri 2/19/21
75		CAT Generator	140 days	Tue 9/1/20	Wed 3/24/21
76		Sump Pump	84 days	Wed 8/26/20	Mon 12/21/20
77		Plug Valves	84 days	Wed 8/26/20	Mon 12/21/20
78		Check Valves	56 days	Wed 9/9/20	Wed 11/25/20
79		Sewer Air/Vac	56 days	Wed 8/5/20	Wed 10/21/20
80		Flow Meter	42 days	Wed 9/9/20	Thu 11/5/20
81		Sump Termination Panels	112 days	Wed 9/9/20	Tue 4/13/21
82		Instrumentation and Control	112 days	Mon 9/14/20	Tue 4/13/21
83		E-4 LED Wall Packs	70 days	Mon 8/3/20	Thu 11/26/20
84		Light Pole	70 days	Mon 8/3/20	Thu 11/26/20
85		**Project Start Up**	**119 days**	**Tue 7/21/20**	**Fri 1/1/21**
86		Call in USA	5 days	Mon 12/28/20	Fri 1/1/21
87		Assess Wet Well	1 day	Tue 7/21/20	Tue 7/21/20
88		Power for Bypass Pumps	60 days	Mon 9/7/20	Fri 11/27/20



Project: FCC5342 - TCWD Bell C
Date: Thu 10/1/20

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

ID	Task Mode	Task Name	Duration	Start	Finish
89		TCWD Inspect and Release Panel	1 day	Mon 11/30/20	Mon 11/30/20
90		Setup Bypass, Install Temp Fence	2 days	Tue 12/1/20	Wed 12/2/20
91		**Project Demo and Installation**	**105 days**	**Mon 1/4/21**	**Fri 5/28/21**
92		Demo of Above Ground	2 days	Mon 1/4/21	Tue 1/5/21
93		Surveying	1 day	Wed 1/6/21	Wed 1/6/21
94		Shoring, Footings and Wall	14 days	Thu 1/7/21	Tue 1/26/21
95		Exc & Install Vault & Epoxy Well/Replace Wet Well	1 day	Wed 1/27/21	Wed 1/27/21
96		Install Piping	5 days	Thu 1/28/21	Wed 2/3/21
97		Trench for Electrical Conduits	2 days	Thu 2/4/21	Fri 2/5/21
98		Site Underground Conduit System	21 days	Mon 2/8/21	Mon 3/8/21
99		Level Transducer/Floats at Well, Cond. Inst at Vault	9 days	Thu 1/28/21	Tue 2/9/21
100		Form & Pour Concrete Slabs	5 days	Tue 3/9/21	Mon 3/15/21
101		Install MCC, Sump Term. Panel, Switchboard, ATS	10 days	Wed 4/14/21	Tue 4/27/21
102		Install Wiring and Lighting	14 days	Wed 4/28/21	Mon 5/17/21
103		Install Equipment and Tanks	1 day	Thu 3/25/21	Thu 3/25/21
104		Conduit Connection at Generator	2 days	Fri 3/26/21	Mon 3/29/21
105		Ornamental Fence	3 days	Tue 3/30/21	Thu 4/1/21
106		Asphalt Paving	1 day	Fri 4/2/21	Fri 4/2/21
107		SCE Metering/Cable Install for Power to Switchboard	20 days	Wed 4/28/21	Tue 5/25/21
108		Remove Bypass & Testing	2 days	Tue 3/30/21	Wed 3/31/21
109		Concrete Restoration	3 days	Mon 4/5/21	Wed 4/7/21
110		Substantial Completion	1 day	Wed 5/26/21	Wed 5/26/21
111		Punch List	2 days	Thu 5/27/21	Fri 5/28/21
112		Project Complete	1 day	Mon 5/31/21	Mon 5/31/21



Project: FCC5342 - TCWD Bell C
Date: Thu 10/1/20

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS

ITEM 3: DISCUSSION AND POSSIBLE ACTION(S) CONCERNING TRABUCO CANYON WATER DISTRICT'S SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM UPGRADE PROJECT

The District's Supervisory Control and Data Acquisition (SCADA) System is a critical system used for the daily operation and monitoring of facilities in the water, wastewater, and recycled water systems. The SCADA system includes alarms, remote monitoring and controls, and data logging of the District's various facilities including the water and wastewater treatment plants, pump stations, sewage lift stations, and reservoirs. The SCADA system consists of various telemetry, programmable logic computers, PCs, radios, controllers, and antennas of various heights and types. The SCADA system continuously monitors the District's facilities and reports alarm conditions to the operators on a twenty-four hour per day basis every day.

At times, the SCADA system requires complex programming of different software, some of which is outdated and not supported by the original software developer. In addition, the programming and applications are custom to water and wastewater systems and an understanding of operations is necessary when working on the SCADA system. In addition, the District's geography, varying elevations, and remote facilities require the use of different methods of communicating within the SCADA system, including low and ultra-frequency radios, licensed and unlicensed frequencies, and the internet. Over the past 25 years or more, the SCADA system has undergone upgrades and replacement of components with several no longer supported or available for replacement. The maintenance of the SCADA system is performed by one of the District's Mechanical Technologists with assistance from both Beavens Systems and TESCO Controls, Inc.

Staff has implemented a phased approach to update the District's SCADA System, as summarized below:

1. Phase 1 - SCADA System Assessment Study (Completed December 2017).
2. Phase 2 - Wide Area Network Improvements and Hardware Replacement (Completed January 2019).
3. Phase 3 - Radio Frequency system Analysis and Field Study (Exhibit 1), Software Platform Evaluation and Selection and Purchasing of the Remote PLC Hardware (Completed June 2020).
4. Phase 4 (Exhibit 3):
    a. Consolidation of the existing SCADA platforms (Intellution FIX and Wonderware) into a single Wonderware InTouch application
    b. Upgrade of the existing main control panel PLC and HMI at the Trabuco Creek Groundwater Treatment Facility (TCGWTF)
    c. Implementation of a high-speed radio backbone network throughout the water/wastewater system

FUNDING SOURCE:
General Fund

FISCAL IMPACT (PROJECT BUDGET)
Phase 1: $45,000
Phase 2: $200,000
Phase 3: $400,000
Phase 4: $600,000

COSTS TO DATE
Phase 1: $ 44,777 - Study (TESCO/Beavens)
Phase 2: $ 182,520 - WAN Improvements/Hardware/Licensing/Programming/Virtualization (TESCO/Beavens)
Phase 3: $ 386,840 – Radio Frequency Study, Software Evaluation and Purchase of Remote Site PLC's (TESCO)

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENVIRONMENTAL COMPLIANCE:
Not Applicable

RECOMMENDED ACTION(S):
Recommend the Board of Directors authorize the General Manager to execute a contract for the Fiscal Year 2020-2021 SCADA Upgrades to TESCO Controls, Inc. in the not to exceed amount of $580,120 (Action Calendar).

EXHIBITS:
1. Radio Survey Study-Final Draft
2. SCADA Upgrade Presentation
3. Fiscal Year 20/21 Recommended Improvements Proposal

CONTACTS (staff responsible): PALUDI/LAUSTEN

SCADA and PLC Replacement Project

October 7, 2020 Engineering/Operations Committee Meeting

Installation Plan 2020-2022

TRABUCO CANYON WATER DISTRICT

SCADA Upgrade Progress

Fiscal 2020 –

- High Speed Radio Sites Upgrade
- Convert iFix SCADA to Wonderware
- Upgrade PLC & Communication at GWTP

Fiscal 2021 –

- Upgrade Remote Sites Radios and PLCs
- Install New SCADA Software and Hardware

Fiscal 2022 –

- Upgrade WWTP and Dimension

Fiscal 2020 Projects

High Speed Radio Sites Upgrade

1. Install high speed radio links to Joplin
2. High Speed Radio Sites Upgrade + Training

Convert iFix SCADA Applications to Wonderware

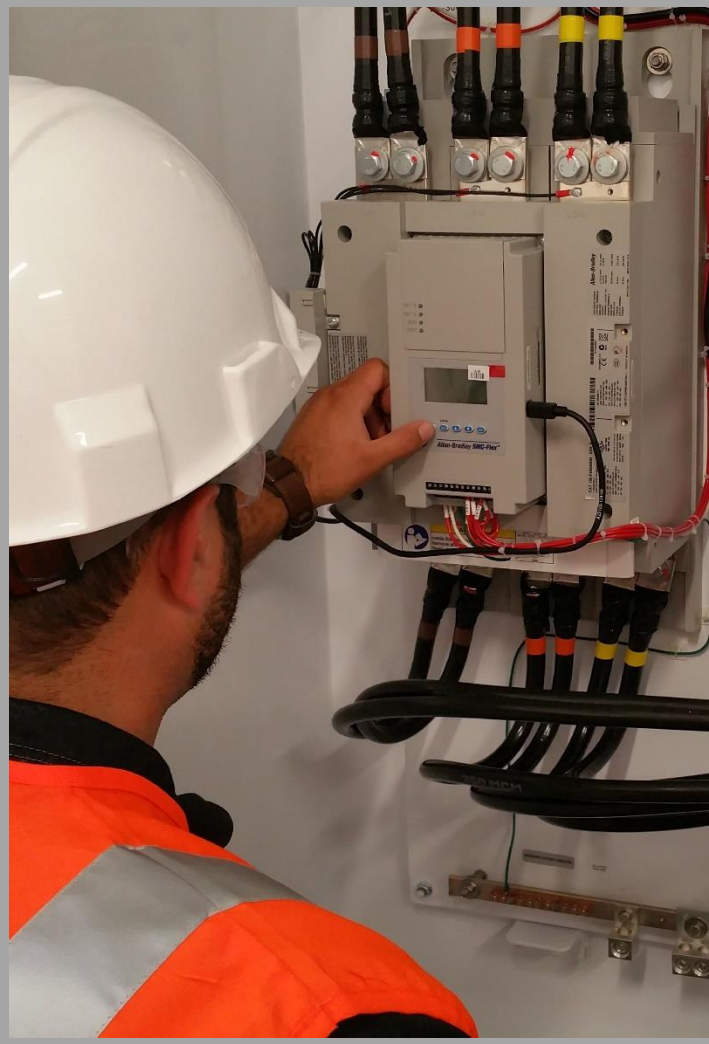
1. Convert Dimension SCADA Application
2. Convert WWTP SCADA Application + Training

Upgrade PLC and Operator Interface at GWTP

1. New PLC, Computer, & Report Generator

Fiscal 2021 Projects

- PLCs Have Already Been Purchased for Remote Sites
- Purchase and Install Remaining Radio Telemetry
- Program and Install Remote Site PLCs
- Purchase Wonderware SCADA Software & Hardware
- Screen, Report, and Alarm Standards Workshops
- Integrate All Remote Sites Into New SCADA Software
- Purchase PLCs for Treatment Plants



At end of Fiscal 2021, all remote sites on new SCADA, all radio telemetry in-place, all PLCs purchased, WWTP and Dimension remain on original PLC hardware

Fiscal 2022 Projects

- Dimension WTP PLC Upgrade and Integration Into New SCADA System
- WWTP PLC Upgrade and Integration Into New SCADA System
- Final System Documentation
- Final Training

TESCO CONTROLS, INC. www.TescoControls.com

Corporate Office
8440 Florin Road, Sacramento, CA 95828
P.O. Box 299007, Sacramento, CA 95829
PH: 916.395.8800 FX: 916.429.2817

To: Trabuco Canyon Water District
Quote Date: 9/30/2020

Attn: Lorrie Lausten
Quote No.: 20I087Q01

Re: Trabuco Canyon Water District
Fiscal 2020 Improvements (SCADA Application Consolidation, TCGWTF Main PLC Upgrade, & High-Speed Backbone Implementation)

Dear Lorrie:

Thank you for your continued interest in TESCO products, services, and solutions. We are pleased to quote the following scope of work pertaining to the above-referenced project.

Scope of Work

This quote is inclusive of the hardware/software upgrades and TESCO services required to complete the recommended improvements funded through Trabuco Canyon Water District's (TCWD) 2020 fiscal budget. The improvements will consist of the following:

- consolidation of the existing SCADA platforms (*Intellution FIX and Wonderware*) into a single Wonderware InTouch application
- upgrade of the existing main control panel PLC and HMI at the Trabuco Creek Groundwater Treatment Facility (TCGWTF)
- implementation of a high-speed radio backbone network throughout the water/wastewater system

TESCO will utilize TCWD's existing Wonderware InTouch licensing and virtualized SCADA servers hosted at the Dimension Water Filtration Plant (DWFP) and Wastewater Treatment Plant (WWTP) to redevelop and merge the existing Intellution FIX (*Version 7.0*) applications with the Wonderware platform currently monitoring TCGWTF. The existing alarm notification software (*SCADAlarm*) will also be upgraded and converted to WIN-911 Pro. Both the Wonderware SCADA and WIN-911 alarm notification applications will be developed and configured as required to retain the functionality provided through the existing applications.

For the PLC and HMI upgrade at TCGWTF, TESCO will replace the existing Quantum and Advantech units with a new Modicon M580 controller and Harmony GTU HMI. The new hardware will be programmed to replicate the control logic executed through the existing devices. TESCO will also equip the new HMI with a data logging function to allow TCWD to extract data and still produce manual reports locally if there is ever a communications loss with the SCADA servers and an inability to generate automated reports through Wonderware InTouch ReportBuilder.

Lastly, TESCO will implement the new high-speed radio backbone network as designed from the results of the recently performed radio study. The high-speed radios will utilize the licensed 4.9GHz frequency band and be equipped at the following eight (8) sites: Joplin Reservoir, WWTP, Dove Canyon Reservoir, Main Office, TCGWTF, Harris Grade Reservoir, Saddle Crest Reservoir, and DWFP. In addition to the new high-speed radios, TESCO will also supply and configure the unlicensed 900MHz and licensed 450MHz radios required as subnetwork access points at these sites.

Refer to the *Scope of Supply* below for a complete listing of the materials and services to be provided by TESCO.

Scope of Supply

Item	Qty	Description
		FISCAL 2020 IMPROVEMENTS
1	1	**Trabuco Creek Groundwater Treatment Facility – Main Control Panel Upgrades** to include: ▪ Modicon M580 PAC Controller ▫ Controller & I/O Rack Backplane ▫ (2) DC Power Supplies ▫ Central Processing Unit ▫ (6) 16-Point DI Modules ▫ (2) 16-Point DO Modules ▫ (4) 8-Channel AI Modules ▫ (2) 8-Channel AO Modules ▫ Backplane & Cable Expanders as required ▫ I/O Terminal Strip Connectors as required ▪ Harmony GTU HMI ▫ CPU Box for Universal Panel ▫ 18.5" Touch Smart Display ▫ SD Memory Card
2	1	**Joplin Reservoir – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ (3) PoE Injectors with Ethernet Lightning Arrestors ▫ 900MHz AP Radio with Coaxial Lightning Arrestor ▫ 450MHz AP Radio with Coaxial Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ (3) High-Speed 4.9GHz Radios with Built-in Antennas ▪ (2) Omni Antennas ▪ Radio/Antenna Mounting Kits ▪ Ethernet & Coaxial Feedline Cables as required ▪ Cable Grounding & Weatherproofing as required
3	1	**Wastewater Treatment Plant – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply

Item	Qty	Description
		▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ PoE Injector with Ethernet Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ High-Speed 4.9GHz Radio with Built-in Antenna ▪ Radio/Antenna Mounting Kit ▪ Ethernet Feedline Cable as required ▪ Cable Grounding & Weatherproofing as required
4	1	**Dove Canyon Reservoir – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ (3) PoE Injectors with Ethernet Lightning Arrestors ▫ 900MHz AP Radio with Coaxial Lightning Arrestor ▫ 450MHz AP Radio with Coaxial Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ (3) High-Speed 4.9GHz Radios with Built-in Antennas ▪ (2) Omni Antennas ▪ Radio/Antenna Mounting Kits ▪ Ethernet & Coaxial Feedline Cables as required ▪ Cable Grounding & Weatherproofing as required
5	1	**Main Office – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ PoE Injector with Ethernet Lightning Arrestor ▫ GFCI Duplex Receptacle

Item	Qty	Description
		▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ High-Speed 4.9GHz Radio with Built-in Antenna ▪ Radio/Antenna Mounting Kit ▪ Ethernet Feedline Cable as required ▪ Cable Grounding & Weatherproofing as required
6	1	**Trabuco Creek Groundwater Treatment Facility – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ PoE Injector with Ethernet Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ High-Speed 4.9GHz Radio with Built-in Antenna ▪ Radio/Antenna Mounting Kit ▪ Ethernet Feedline Cable as required ▪ Cable Grounding & Weatherproofing as required
7	1	**Harris Grade Reservoir – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ (2) PoE Injectors with Ethernet Lightning Arrestors ▫ 900MHz AP Radio with Coaxial Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ (2) High-Speed 4.9GHz Radios with Built-in Antennas

Item	Qty	Description
		▪ Omni Antenna ▪ Radio/Antenna Mounting Kits ▪ Ethernet & Coaxial Feedline Cables as required ▪ Cable Grounding & Weatherproofing as required
8	1	**Saddle Crest Reservoir – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ (2) PoE Injectors with Ethernet Lightning Arrestors ▫ 450MHz AP Radio with Coaxial Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ (2) High-Speed 4.9GHz Radios with Built-in Antennas ▪ Omni Antenna ▪ Radio/Antenna Mounting Kits ▪ Ethernet & Coaxial Feedline Cables as required ▪ Cable Grounding & Weatherproofing as required
9	1	**Dimension Water Filtration Plant – Communications Hardware** to include: ▪ Radio Panel (*Strut-Mount NEMA 3R Enclosure*) ▫ Panel Disconnect ▫ Power Distribution Blocks as required ▫ Surge Protection Device ▫ Circuit Breakers as required ▫ 1500VA Uninterruptable Power Supply ▫ 24VDC Power Supply ▫ 8-Port Managed Ethernet Switch with Patch Cables as required ▫ PoE Injector with Ethernet Lightning Arrestor ▫ GFCI Duplex Receptacle ▫ Panel Service Light with Switch ▫ Panel Fan Kit with Filtered Louvers ▫ Panel Condensation Heater with Thermostat ▫ DIN Rails, Terminal Blocks, Fuses, Relays, Wires, Ground Bus Bar, & Nameplates/Labels as required ▪ High-Speed 4.9GHz Radio with Built-in Antenna ▪ Radio/Antenna Mounting Kit ▪ Ethernet Feedline Cable as required ▪ Cable Grounding & Weatherproofing as required

Item	Qty	Description
10	1	**SCADA Hardware & Software** to include: ▪ (2) WIN-911 Pro Version 7 Alarm Notification Software Licenses with Failover (*primary and secondary nodes with manual failover*) ▪ (2) WIN-911 USB TAPI Modems (*voice-call alarm notification*) ▪ (2) ReportBuilder Software Licenses for Wonderware InTouch
11	Lot	**Professional Services** to include: ▪ Project Management ▪ Engineering ▫ engineered bill of materials, engineered shop drawings, equipment schematics, engineered submittals, technical data, as-built documentation, and project records ▪ Manufacturing Services ▫ fabrication/manufacturing, assembly, equipment wiring, and factory testing ▪ PLC/HMI Programming ▫ redevelop the existing Modicon Quantum PLC program at TCGWTF within the new M580 platform, while maintaining the existing process application control logic ▫ program the new Harmony HMI at TCGWTF for operator control and monitoring of the plant processes — develop screens to display the plant processes, operator controls, control setpoints, alarms, and trends currently provided through the existing Advantech Industrial Panel PC/HMI — configure the new HMI to log the primary data that is currently reported at TCGWTF ▫ assist the project SCADA Programmer with the PLC register and SCADA tag assignments required for integration with the Wonderware InTouch application ▫ testing of the new PLC and HMI programs to ensure proper functionality and correct execution of operator control/input ▪ SCADA Programming ▫ consolidate and merge the existing Intellution FIX (*Version 7.0*) SCADA applications (*primary and secondary nodes*) utilized for DWFP and WWTP with the Wonderware InTouch application currently monitoring TCGWTF ▫ redevelop the existing Wonderware application as required to replicate the monitoring/control of DWFP and WWTP currently provided through the FIX application ▫ migrate the existing SCADAlarm alarms at TCGWF, DWFP, and WWTP to the new WIN-911 platform and configure the application for alarm notification via voice-calls ▫ integrate ReportBuilder with the Wonderware InTouch application and configure the software for automated reports of the TCGWTF, DWFP, and WWTP facilities ▫ testing of the redeveloped Wonderware InTouch application to ensure proper functionality and correct execution of operator control/input ▪ Networking/Communications/Telemetry ▫ implementation of the new high-speed backbone network

Item	Qty	Description
		for communications throughout the water/wastewater system ▫ reconfigure the existing core switching and routing equipment throughout the SCADA network as required to integrate the new high-speed backbone ▫ configuration of the new radio hardware to be installed at the eight (8) high-speed backbone sites listed above ▫ testing and alignment of the new radio antennas to ensure reliable links/communications are established ▫ FCC coordination and license procurement for the 4.9GHz and 450MHz frequencies ▫ update the SCADA system architecture diagram to reflect the integration of the new high-speed backbone network ▪ Field Service / Product Startup ▫ retrofit of the new M580 PLC and Harmony HMI within the existing main control panel at TCGWTF ▫ assist the project Network/Communications Engineer with alignment of the new radio antennas at the high-speed backbone sites ▫ product quality review, verification of installation, parameter/configuration adjustments as required, software upload/download as required, instrument/device signal spanning, function checks, and startup ▪ Onsite Training ▪ O&M Manuals
		TOTAL (Items 1-11, including applicable sales tax): $580,120.00

Project Clarifications

- Unless otherwise indicated by the Scope of Work above, quote is to **furnish only** and does not include any trade labor, trade work, construction work, site improvement, contractor services, or any trade installation services. Any trade labor and/or related trade work shall be performed by others/contractor.
- Unless otherwise indicated by the Scope of Work above, the following is **not** included within this quotation:
  - Conduit, field wire, tubing, or basic trade installation materials (brackets, screws, bolts, j-box, stanchions, pull-box, etc.)
  - Instrumentation mounting components, brackets, stanchions, sunshields, etc.
  - Local control stations and/or field mounted disconnects.
  - Instrumentation, devices, components, or equipment not specifically identified in the above quotation.
  - Fiber optic patch panels, cable, splicing or terminations.
  - Networking infrastructure or architecture modifications to existing facilities.
  - Any 3rd party testing, harmonic testing/analysis, protective device coordination study, short-circuit analysis, or Arc-Flash Risk Assessment (AFRA) services.
  - Electrical interconnection diagrams for equipment not furnished by TESCO.
  - ISA process control loop diagrams.
  - Signal loop diagrams for equipment not furnished by TESCO.

Terms & Conditions

- Quote is firm for 30 days unless otherwise stated.
- Intellectual Property and Confidentiality Notice: The scope of work and price quotation shall not be construed as a formal design or recommendations on design for the related project. All content contained within this

quotation is the intellectual property under the proprietorship of Tesco Controls, Inc. and is subject to applicable copyright laws. Such intellectual property shall not be duplicated, replicated, copied, or shared without explicit written consent from Tesco Controls, Inc., as it contains confidential information and work product developed exclusively for use by Tesco Controls, Inc.

- Submittals: to be provided approximately **10-12** weeks after receipt of purchase order, written notice of intent, or notice to proceed.
- Delivery: to be scheduled approximately **16-20** weeks minimum after submittal approval.
- Unless otherwise stated above, price does not include any sales tax, use tax, or applicable fees; please apply any taxes and/or fees as appropriate. Please note that all invoices will include sales tax where applicable.
- TESCO price is FOB factory, full freight allowed.
- TESCO warranties against defect in design, workmanship, and materials for a period of one year from date of installation and does not exceed 18 months from the date of shipment from the factory.
- TESCO carries liability insurance, with full workers' compensation coverage.
- Terms are net 30 days on approved credit accounts.
- Interest will be applied to all past due invoices.
- All merchandise sold is subject to lien laws.
- Final retention to be paid within 10 days after the project notice of completion.

Please feel free to contact us at (916) 395-8800 to discuss any questions or comments you may have regarding this quotation.

Sincerely,

TESCO CONTROLS, INC.

John Wright
Technical Sales
jwright@tescocontrols.com

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS
ITEM 4: DISCUSSION AND POSSIBLE ACTION(S) RELATED TO THE PROPOSED PALOMA SQUARE DEVELOPMENT (DOVE CANYON PLAZA) AND OTHER RELATED MATTERS

Trabuco Canyon Water District (TCWD or District) owns the Administration Facility and the property upon which it resides; the property is adjacent to the Dove Canyon Plaza commercial center. On July 24, 2019, Dove Canyon Recovery Acquisition, LLC (DCRA), the owner of Dove Canyon Plaza, with their consultant William Lyon Homes (now Taylor Morrison) submitted a proposal to the City of Rancho Santa Margarita (City) for a change in use from commercial to residential. The proposed project is titled "Paloma Square." The initial submittal to the City, and all subsequent submittals, project information, and correspondence between City and William Lyon Homes/Taylor Morrison related to Paloma Square are available on the City's website. The District's website, under the "Community" tab, also includes information and correspondence regarding proposed project.

Due to the potential impacts of the Paloma Square development to the District's Administration Facility, District Staff recommended conducting a parking study. At the February 19, 2020 Regular Board Meeting, the Board of Directors authorized the General Manager to execute a Contract with Albert Grover and Associates for Trabuco Canyon Water District's Administration Facility Parking Study for a not to exceed amount of $10,000. As of July 1, 2020, Albert Grover and Associates' assets have been acquired by AGA Engineer's, Inc. due to retirement of the owner.

More information may be presented at the time of the meeting.

FUNDING SOURCE:
General Fund

FISCAL IMPACT:
$10,000

ENVIRONMENTAL COMPLIANCE:
Not applicable

RECOMMENDED ACTIONS:
Recommend the Board of Directors authorize the General Manager to execute the Assumption and Assignment of Contract from Albert Grover and Associates to AGA Engineers, Inc. (Action Calendar).

EXHIBIT(S):
1. AGA Engineers, Inc. Request for Project Assignment to New Company
2. AGA Engineers, Inc. Assignment and Assumption of Contract

CONTACTS (staff responsible): PALUDI/PEREA/LAUSTEN

AGA Engineers, Inc.

August 13, 2020

Ms. Lorrie Lausten, P.E.
Principal Engineer
Trabuco Canyon Water District

RE: Request for Project Assignment to New Company - AGA Engineers, Inc.

Dear Ms. Lausten

AGA Engineers, Inc., a California corporation ("AGA Engineers"), signed an Asset Purchase Agreement on June 5, 2020 to acquire certain assets of Albert Grover & Associates.

AGA Engineers was founded by Chalap Sadam, MS, MBA, who is a Registered Professional Engineer in the State of California in both Civil Engineering and Traffic Engineering. He is a recognized expert with over three decades of experience in traffic signal systems, communication systems, Intelligent Transportation Systems (ITS), intersection improvements, safety systems and general traffic engineering/transportation planning services. He has successfully delivered multitude of traffic and ITS projects to various cities and counties throughout Southern California.

AGA Engineers team is expected to include experienced Civil and Traffic Engineers including Mark Miller and certain other current employees of Albert Grover & Associates. Mr. Sadam, with nearly thirty years of employment with Albert Grover & Associates, will devote his experience and attention to cater to the needs of AGA's clients.

The purchase became effective July 1, 2020 and includes the assignment of all rights to the parking demand study for the proposed Paloma Square Condominium Project. Of course, this is subject to City approval. Please let us know if you need any further information.

BUYER:
AGA ENGINEERS, INC.

By_____
Chalap K. Sadam, President

SELLER:
ALBERT GROVER & ASSOCIATES, INC.

By_____
Mark Miller, President

AGA Engineers, Inc.
211 Imperial Highway, Suite 208, Fullerton, CA 92835
(714) 992-4592 Email: aga@agaengineersinc.com

ASSIGNMENT AND ASSUMPTION OF CONTRACT

THIS ASSIGNMENT AND ASSUMPTION OF CONTRACT (the "Assignment") is entered into effective as of July 1, 2020, by AGA Engineers, Inc., a California corporation, ("Buyer"), and Albert Grover & Associates, Inc., a California corporation (the "Seller").

RECITALS

A. Seller is a Party to that certain agreement with Trabuco Canyon Water District ("Owner") with regard to the parking demand study for the proposed Paloma Square Condominium Project dated February 18, 2020, and any amendments thereto (collectively, the "Contract").

B. Buyer is party to that certain Asset Purchase Agreement dated June 5, 2020 (the "APA") by and between Buyer and Seller for the purchase of certain assets of Seller.

C. Seller desires to assign to Buyer and Buyer desires to acquire all of Seller's interest in and to the Contract, subject to the Owner's consent.

FOR VALUABLE CONSIDERATION, the receipt and sufficiency of which are hereby acknowledged, it is agreed as follows:

1. Assignment. Subject to the Owner's consent, this Assignment shall be effective as of the time of Closing (as defined in the APA) under the APA (the "Effective Time"). As of the Effective Time, Seller hereby grants, conveys, and assigns unto Buyer, all of Seller's right, title, and interest in, to and under the Contract, subject however, to the provisions of the Contract and this Assignment.

2. Assumption. Subject to Owner's consent, effective as of the Effective Time, Buyer hereby assumes all of Seller's responsibilities, liabilities, covenants and obligations set forth in the Contract, and agrees to perform and observe all of Seller's covenants and obligations contained in the Contract. Notwithstanding the foregoing, the parties hereto agree that Buyer does not assume (and Seller shall remain exclusively liable for) any liability or obligation of Seller that was incurred, arising under or in connection with the Contract prior to the Effective Time.

3. Seller's Representations and Warranties. Seller hereby represents and warrants to Buyer, which representations and warranties shall survive the execution and delivery of this Assignment and the assignment of the Contract, as follows:

A. Contract. The Contract has not been modified or amended, is in full force and effect and contains the entire agreement between Seller and Owner.

B. Defaults. There are no defaults by Seller under the Contract, and there are no disputes between Seller and Owner concerning the Contract.

C. Assignment. Seller is in full possession of the Contract as a party thereto and has not previously sold, transferred, hypothecated, encumbered, assigned or subleased all or any portion of Seller's right, title or interest in and to the Contract.

D. Owner Consent Required. In accordance with Section 8.5 of the Contract, the consent of Owner is required. This effectiveness and enforceability of this Agreement is subject to the consent of the Owner.

4. Appointment. Seller hereby irrevocably appoints Buyer, its successors and assigns, as the attorney and agent of Seller, in Seller's name and stead, to enforce the provisions of the Contract to the extent said rights are assigned herein. Seller hereby acknowledges that such power of attorney is coupled with an interest and may not be revoked in any manner or for any reason.

5. Binding Effect. This Assignment shall inure to the benefit of, and shall be binding upon, the parties hereto and their respective successors and assigns.

6. Choice of Law. This Assignment shall be governed by and construed under the laws of the State of California, without regard to conflicts-of-laws principles that would require the application of any other law.

7. Attorneys' Fees. Should either party institute any legal action or proceeding to enforce the provisions of this Assignment, the prevailing party shall be entitled to recover its reasonable attorneys' fees and costs incurred in connection with the exercise of its rights and remedies hereunder as well as court costs and expert witness fees as the court shall determine.

8. Execution of Assignment. This Agreement may be executed in any number of counterparts, using facsimile signatures, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

[CONTINUED ON NEXT PAGE]

9. APA Terms Remain. No language, terms, provisions, rights, liabilities, obligations, assumptions or any other terms in this Assignment shall change, alter or amend any terms, provisions, rights, liabilities or obligations as between Seller and Buyer under the APA. If there is a conflict between language or any term, provision, right, liability, obligation or assumption in this Assignment and the APA, as between the Seller and Buyer, the language or the term, provision, right, liability, obligation or assumption in the APA shall take precedence and apply and control.

BUYER:
AGA ENGINEERS, INC.

By_____
Chalap K. Sadam, President

SELLER:
ALBERT GROVER & ASSOCIATES, INC.

By_____
Mark Miller, President

By its signature below, the Owner hereby consents to this Assignment between Seller and Buyer as noted above:

OWNER
TRABUCO CANYON WATER DISTRICT

By:_____

Name:_____

Title:_____

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS
ITEM 5: SADDLEBACK MEADOWS DEVELOPMENT (181 DU's) – HARRIS GRADE RESERVOIR FEASIBILITY STUDY DRAFT REPORT

The proposed Saddleback Meadows residential development (Development) is located on 222 acres of property within the unincorporated area of southeastern Orange County, California, in the Foothill-Trabuco area. The parcel is being planned and engineered for the California Quartet, LTD, ("CQ") by Hunsaker and Associates ("Hunsaker"). The proposed development has gone through several iterations and modification, and most recently, consisted of 181 detached single-family homes. A Sub-Area Master Plan ("SAMP") for this development was originally prepared by PSOMAS in May 2006. Hunsaker requested that the District prepare an updated SAMP for the Development. Staff has been working with PSOMAS on the updated SAMP.

The total storage (operational, fire flow and emergency) required for the development is 870,000 gallons. Due to geological constraints and potential litigation from the adjoining landowner, the proposed elevation of the storage is much lower than previous plan, which would create an isolated zone for the Development. PSOMAS' recommendation is to utilize the money that the developer would have spent on the on-site reservoir and pool it with other available storage fee funds to construct additional storage at the Harris Grade Reservoir site. The District has contracted with Tetra Tech for $119,211 to perform a Feasibility Study on removing the 420,000-gallon tank at the site and replacing it with a tank that can accommodate the storage needs of both the District and the Development. The study lends itself to a cost-sharing agreement between TCWD and CQ based on each party's percentage of the new planned storage volume for Harris Grade (870,000 gallons or 39% for Saddleback Meadows, and 1,380,000 gallons or 61% for TCWD).

The Draft Harris Grade Reservoir Siting Study completed by Tetra Tech is included as Exhibit 1. At the September 2, 2020 Engineering/Operational Committee Meeting, the Committee recommended that District staff evaluate the feasibility of constructing a reservoir on the District's Porter Property and bring the matter back to the Committee for review. Tetra Tech has provided a proposal to evaluate the Porter alternative and the proposed budget is within the contingency approved by the Board (Exhibit 2).

FUNDING SOURCE:
Funds for the Feasibility Study will originate from the Developer and the WRES Fund.

FISCAL IMPACT
TCWD's share of the project is estimated to be $72,719, not including any potential contract amendments.
Development Sub-Area Master Plan: $34,000 (Paid for by the Developer)

ENVIRONMENTAL COMPLIANCE:
All Environmental Compliance will be met by the Developer.

RECOMMENDED ACTION:
Committee to receive information at time of the Committee Meeting.

EXHIBITS:
1. Harris Grade Reservoir Siting Study-Draft
2. Porter Property Planning Level Study - Proposal

CONTACTS (staff responsible): PALUDI/LAUSTEN

DRAFT

Trabuco Canyon Water District

Harris Grade Reservoir Siting Study

TETRA TECH

August 2020

Harris Grade Reservoir Siting Study

August 2020

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1. PROJECT OBJECTIVES AND BACKGROUND

1.1 PURPOSE

In 2016 the Trabuco Canyon Water District (District) completed the "Domestic Water Storage and Reservoir Siting Study" to determine ideal locations within the District's system for additional water storage for future planned developments and emergencies. The study determined that the Harris Grade Reservoir site is one of four locations for adding potable water storage within the District.

The District retained Tetra Tech to conduct a Reservoir Siting Study evaluating the feasibility of demolishing an existing 0.42 MG steel reservoir and constructing a new 2.0 to 2.7 MG reservoir, including upgrading of the inlet and outlet piping leading up the slope to the site. This siting study will present alternatives on the location, shape, and size for a new reservoir at the existing Harris Grade Site. Additionally, this siting study will address the reservoir type (prestressed concrete, steel, or conventional cast in place concrete), interconnections with the existing facilities, inlet and outlet piping, drainage impacts, site access, and any required site modifications or relocations.

1.2 BACKGROUND

The Harris Grade Pressure Zone (HGL 1504-feet) is the largest pressure zone within the District and receives water from the Cooks Pressure Zone (HGL 1250-feet) via the Ridgeline Booster Pump Station, which boosts the water through 14-inch and 10-inch pipelines on Live Oak Canyon Road. The Harris Grade site sits on a hill, with slopes as great as 2:1, above Live Oak Canyon Road and is connected to the waterlines in the road with an existing 10-inch and 14-inch pipeline running in a 20-foot wide easement down the hillside.

The site is located within the Cleveland National Forest on land leased to the District from the United States Forest Service. The site can be accessed from Live Oak Canyon Road through a 10-foot wide access road within a 20-foot wide easement. The grade of the existing access road to the reservoir site varies from flat to 16 to 17 percent. Overhead electrical lines coming from Live Oak Canyon Road provide the site power. The overall site is shown on Figure 1-1.

The District owns and operates two reservoirs within the Harris Grade Reservoir Site, one 2.0 MG steel reservoir constructed in 1981 (Reservoir No. 1) and one 0.42 MG steel reservoir, constructed in 1965 (Reservoir No. 2). Summarized below are the characteristics of the existing Harris Grade Reservoirs. The existing Harris Grade Reservoir site is shown on Figure 1-2.

Table 1 – Existing Harris Grade Reservoir Characteristics

	Reservoir No. 1	Reservoir No. 2
Material	Steel (Circular)	Bolted Steel (Circular)
Capacity	2.0 MG	0.42 MG
Year Constructed	1981	1965
Finished Floor High Water Level (HWL)	1473 feet 1504 feet	1473 feet 1496 feet

Due to the high water elevation difference between the two tanks; they are unable to float off each other. The District operates an on-site bypass pump to pump water from the small tank to the larger tank.

2. DESIGN CRITERIA

Design criteria for the new tank and appurtenances is summarized in the table below:

Table 2 – Design Criteria Summary
Reservoir Design Standards: The new tank shall be designed to the following design standards 1. California Department of Drinking Water (DDW) requirements outlined in the California Code of Regulations Title 22 "Design and Construction of Water Distribution Reservoirs" 2. American Water Works Association (AWWA) a. For pre-stressed concrete tanks: Standard D110; "Wire and Strand-Wound Circular Prestressed Concrete Water Tanks" b. For steel tanks: Standard D100; "Welded Carbon Steel Tanks for Water Storage" 3. Trabuco Canyon Water District Standard Plans and Specifications
Storage Volume: 1. Minimum Storage Volume: 2.0 MG 2. Desired Storage Volume: 2.7 MG
Floor Elevation (Match Existing): 1473-feet (record drawings – NGVD29) / 1475.4 (survey – NAVD88)
High Water Level Elevation (Match Existing): 1504-feet (record drawings – NGVD29) / 1506.4 (survey – NAVD88)
Sidewater Depth: 31-feet
Inlet/Outlet Piping and Valves: 16-inch separate inlet and outlet connections
Overflow and Drain Piping: • Overflow and drain pipes of the existing reservoirs empty to the surface and sheet flow off site to the adjacent natural terrain. It is anticipated the new overflow and drains will similarly sheet flow off the site. • The overflow size of the new reservoir will be confirmed during preliminary design based on the maximum anticipated fill rate of the reservoir. It is anticipated the proposed tank overflow will go through the tank wall and feature an air gap facility to meet California Department of Drinking Water (DDW) requirements. • A tank drain should be provided to remove unusable water from the reservoir and feature an air gap facility to meet California Department of Drinking Water (DDW) requirements.
Tank Intertie Piping: Tank intertie piping is assumed to be 16-inches to match the new piping from Live Oak Canyon Road (size to be based on the system fill and draw rates and should be confirmed during preliminary design).
Minimum Required Clearance Around Tank: 12-feet
Assumed Temporary Cantilever Shoring Height: 14-feet
Assumed Permanent Retaining Wall Height: 12-feet
Site Access Design Vehicle Size (Interim Site): Single Unit Truck – 30-feet long x 8-feet wide; 42-foot turning radius
Site Access Design Vehicle Size (Final Site): Pickup truck

2.1 STORAGE REQUIREMENTS

The District has the following storage requirements for the Harris Grade Site:

1. A minimum of 1.38 million gallons (MG) of additional storage is required within the District to meet the requirements of the Water Reliability Emergency Storage (WERS) fund. District customers are contributing to the WERS fund, which is reserved for an additional 2.0 MG storage within the District. A portion of the required storage has been built at the Saddlecrest development (0.62 MG) in 2019, but the remaining 1.38 MG is still pending.

2. A minimum of 0.87 MG of storage is required for the future Saddleback Meadows development.
3. A minimum of 0.42 MG of storage is required to replace the existing steel Reservoir No. 2 to be demolished to make room for a new tank.

In order to meet the storage requirements above a minimum 2.7 MG tank is needed.

2.2 PIPING AND APPURTENANCES

The existing piping and appurtenances at the Harris Grade Reservoirs consists of combined tank inlet/outlet pipes, overflow pipes, drain pipes, tank intertie piping, and combined inlet/outlet piping to Live Oak Canyon Road as shown on Figure 1-2. Currently the Reservoirs No. 1 and 2 are operated as follows to promote tank mixing:

1. Flow is let into Reservoir No. 2 through a 6-inch altitude valve and 8-inch inlet/outlet pipeline.
2. Flow is pumped out of Reservoir No. 2 into Reservoir No. 1 through a 6-inch tank intertie. A pump is required because the high water level (HWL) of Reservoir No. 2 is 8-feet higher than that of Reservoir No. 1.
3. Flow to the distribution system is conveyed through a 14-inch outlet on Reservoir No. 1.

The new tank will be designed to float with the existing Reservoir No. 1, therefore both tanks will have identical HWL and finished floor elevations, and a pumped tank intertie will not be required. The proposed tank will have separate inlet and outlet connections, overflow structure, drain line, and intertie piping. Proposed tank piping layouts are shown on Figures 4-1.1, 4-2.1, and 4-3.1. The proposed piping will be configured to accommodate the following:

1. System fills and draws from either tank, while the other tank is isolated.
2. System fills one tank and draws from the other.
3. System fills and draws from both tanks simultaneously.

2.2.1 Piping to Live Oak Canyon Road

Currently the District has a 20-foot wide easement containing existing 10-inch and 14-inch steel pipelines connecting the Harris Grade Reservoirs No. 1 and No. 2 to 10-inch (steel) and 14-inch (ACP) waterlines in Live Oak Canyon Road. The District has determined that the existing 10-inch pipeline will need to be upsized to 16-inches to meet the expected increased system demands.

Constructability of the new 16-inch pipeline is discussed further in Section 5.

2.2.2 Tank Inlet Outlet Piping

Reservoir No. 1

The existing 2.0 MG Reservoir No. 1 was originally designed with a 14-inch combined inlet/outlet pipeline. A 12-inch outlet connection was constructed as a modification to the original design intended to be used as a separate outlet, but is no longer used. The no longer used 12-inch outlet connection contains above grade piping, pump, gate valve, double ball expansion joint, and Cla-Val and is shown in the photo following this paragraph.

Photo 1 – Existing Reservoir No. 1 Inlet Piping Modification

The 12-inch tank outlet was originally intended to boost water approximately 10 psi to give higher pressures at the outskirts of the system, but is no longer in use.

There are two below grade pipe penetrations coming off the 12-inch tank connections. Record drawings are not available showing how the piping from the 12-inch tank connection ties back to the main line. It is recommended that during preliminary design the below grade pipes be located to determine how they are connected to the system.

Currently the District fills to Reservoir No. 2 and draws from Reservoir No. 1. When Reservoir No. 2 is out of service during construction all Reservoir No. 1 will need to operate independently. It is recommended that the unused 12-inch connection be converted to a separate inlet connection with an altitude valve to protect the tank against overfilling.

New Harris Grade Reservoir

The design of the new tank should include the following inlet and outlet design features:

- Separate inlet and outlet connections designed to fill and draw from the tank at opposite sides to promote tank mixing.
- The size of the inlet and outlet lines has been assumed to be 16-inchs to match the diameter of the new pipeline from Live Oak Canyon Road. The size should be confirmed during preliminary design and based on the anticipated tank fill and draw rates.
- A new altitude valve should be sized during preliminary design and be placed on the inlet pipe to prevent overfilling the tank.

- Flexible expansion joints installed at all tank connections to protect the piping and tank against differential settlement or movement during a seismic event.

2.2.3 Tank Overflow and Drain Piping

Overflow and drain pipelines of the existing reservoirs empty to the surface and sheet flow to a riprap pad then off site to the adjacent natural terrain. It is anticipated the new overflow and drain pipelines will also be directed to riprap and sheet flow off the site in a similar manner.

The overflow size of the new reservoir will be confirmed during preliminary design based on the maximum anticipated fill rate of the reservoir. It is anticipated the proposed tank overflow will penetrate through the tank wall and feature an air gap to meet California Department of Drinking Water (DDW) requirements.

A tank drain should be provided to remove unusable water from the reservoir. This is usually the last few feet that cannot be sent to the system and/or any wash down water due to tank cleaning. On a concrete tank the drain will penetrate through the floor and collect in a manhole, where the water can be dechlorinated and released to sheet flow to riprap and then offsite to the natural terrain. On a steel tank a flush type cleanout will be provided through the tank wall, near the bottom of the tank wall.

The required size and connection points of the drain and overflow facilities should be studied in more detail during the preliminary design phase to determine the environmental mitigation measures related to draining the tank.

2.2.4 Tank Intertie Connection

The existing tank intertie connection and pump will be removed and replaced. The new tank will be designed to float off the existing Reservoir No. 1. The new tank intertie should be designed for the maximum tank fill and draw rates in order to fill through one tank and draw from the other. Isolation valves and flexible expansion joints should be placed at each tank connection.

2.3 SITE DESIGN REQUIREMENTS

The following site design elements were considered when developing the tank siting alternatives.

Construction clearance: A minimum of 12-feet of clearance is required around the tank during construction.

Site access (Final): The final site will have similar vehicle accessibility as the existing. The existing site has space for a pickup truck to enter the site and drive around the existing reservoir.

Site access (Interim): The interim construction site will have access for large a single unit truck, approximately the size of a concrete truck or crane (30-feet long x 8-feet wide; 42-foot turning radius).

Final site grading: The site will be graded so that the surface slopes away from the tanks, to avoid ponding adjacent to the tank foundation.

Cantilever shoring: A maximum 14-foot high cantilever shoring was assumed for the purposes of this siting study. Ultimately the shoring design is part of the Contractor's means and methods, however it is recommended that a conceptual shoring plan be developed in the preliminary design phase of the project.

On-site retaining wall: A maximum 12-foot high retaining wall was assumed for the purposes of this siting study. The final retaining wall height and design will be developed during the preliminary design phase of the project.

3. GEOTECHNICAL INVESTIGATION

A "Preliminary Geotechnical Exploration Report" for the project was completed by Leighton Consulting, dated June 18, 2020. As part of the preliminary investigation two hollow-stem auger borings were taken at the site, ranging in depths from 33 to 41 feet below the existing grade. Both borings were terminated due to auger refusal. The complete geotechnical report can be found in Appendix A of this report.

This section summarizes the findings of the preliminary geotechnical report and outlines additional geotechnical investigations required for final design.

3.1 GEOTECHNICAL FINDINGS

Summarized below are geotechnical characteristics of the site and recommendations outlined in the preliminary geotechnical report.

Table 3 – Geotechnical Characteristics
Subsurface Conditions: In general, the borings at the site consisted of artificial fill, alluvium, and bedrock. The southern side of the site consisted of deeper artificial fill and alluvium layers (up to 25 feet below grade), while bedrock was encountered as high as 1 foot below grade at the northern side of the site.
Groundwater: Groundwater was not encountered during the field exploration to a maximum depth of 41-feet. Groundwater is not anticipated to adversely impact the proposed project.
Expansive Soil Characteristics: The expansion potential of the near-surface onsite soils is considered to be low; however, variability in the expansion potential of the near surface onsite soils should be anticipated.
Soil Corrosivity: • Soils exhibit negligible potential for sulfate attack on concrete. • Soils exhibit low corrosion potential to buried ferrous metal in direct contact with the soils.
Rippability: • Near surface bedrock is expected to be excavatable using conventional heavy duty earth moving equipment. • Deeper bedrock excavations may require special ripping techniques such as jackhammers or other percussion devices.
Faulting and Seismicity: There are no known active or potentially active faults traversing the site.
Secondary Seismic Hazards: • Liquefaction Potential is very low. • Seismically-Induced Landslides: The western portion of the site and northerly ascending slope are located within an area that has been identified by the State of California as being potentially susceptible to the occurrence of seismically-induced landslides. • Earthquake-Induced Flooding: The site is not located within an inundation area for dam failure, however the potential for earthquake-induced flooding may exist if the existing reservoir does not meet the current seismic design standards.

3.2 FUTURE GEOTECHNICAL INVESTIGATIONS

Based on the preliminary geotechnical investigation the proposed project is feasible from a geotechnical standpoint. The geotechnical report provided in the attached Appendix A provides recommendations on foundation design parameters, concrete slab on grade design, retaining wall and shoring design parameters, seismic design parameters, and pavement design.

The report found that the potential for seismically-induced landslides exists and should be further evaluated during final design, once a site plan is developed for the project. For this reason it is recommended that a supplemental geotechnical report be prepared during a future phase of design to conduct additional slope stability analysis and confirm geotechnical subsurface conditions.

4. SITING ALTERNATIVES

Based on the design criteria and geotechnical information outlined in the previous sections Tetra Tech has developed the following reservoir siting alternatives shown in Table 4 below.

Table 4 – Summary of Tank Alternatives

Alternative	Description	Material/Shape	Capacity
1A	• 0.42 MG Reservoir No. 2 is demolished, making room for a new reservoir cut into the northern slope of the site • Retaining wall (12-feet high max) • 2:1 and 1:1 permanent slopes	Steel / Circular (97-feet ID)	1.7 MG
1B	Same layout and requirements as Fig 4-1A	Concrete / Circular (97-feet ID)	1.7 MG
2	• 0.42 MG Reservoir No. 2 is demolished, making room for a new reservoir cut into the northern slope of the site • Partially buried tank • Temporary shoring required (assumed 14-feet max high cantilever shoring)	Concrete / Circular (109-feet ID)	2.0 MG
3	• 0.42 MG Reservoir No. 2 is demolished, making room for a new reservoir cut into the northern slope of the site • Partially buried tank • Temporary shoring required (assumed 14-feet max high cantilever shoring) • Temporary construction easement from US Forest Service	Concrete / Circular (125-feet ID)	2.7 MG
4	• 2.0 MG Reservoir No. 1 and 0.42 MG Reservoir No. 2 are demolished for a new reservoir, using the whole site • Requires both tanks to be out of service during construction (approx. 18 months) • Partially buried tank • Temporary shoring required (assumed 14-feet max high cantilever shoring)	Concrete / Rectangular (200-feet x 91-feet, inside wall dimensions)	4.0 MG

As shown in the table above, the only alternative that meets the District's desired 2.7 MG storage volume is Alternative 3. Conceptual final grading and site plan, interim grading plan, and sections are shown in Figures 4-3.1, 4-3.2, and 4-3.3, respectively. As shown in the conceptual grading plans, this alternative requires a temporary easement from the US Forest Service for interim grading operations. The grade around the tank wall varies from 17 feet along the north side and tapers to the finished floor grade along the south of the tank). An AWWA D-110 steel tank is not a feasible tank material for this alternative because steel tanks cannot have differential fill around the tank wall.

The largest tank that can be provided, keeping all grading operations within the limits of the District's lease limits is 2.0 MG, shown in Alternative 2. Similar to Alternative 3, an AWWA D-100 Steel Tank is not a feasible material because the final grading plan requires the north portion of the tank to be partially buried. Conceptual final grading and site plan, interim grading plan, and sections are shown in Figures 4-2.1, 4-2.2, and 4-2.3, respectively.

The largest AWWA D-100 Steel Tank that can be provided on the site is a 1.7 MG tank, as shown in Alternative 4-1. Alternative 4-1 can accommodate circular welded steel AWWA D-100 tank or a prestressed concrete cylinder tank per AWWA D-110 because either tank can be constructed with the clearances shown.

The rectangular concrete tank, Alternative 4-4, can provide approximately 4.0 MG of storage. However, this alternative does not meet District storage requirements when an additional 2.0 MG is included to account for the existing Reservoir No. 1 that will need to be removed for the 4.0 MG tank to be constructed. Additionally, this alternative takes all storage away from the Harris Grade site for the duration of construction. For these reasons, this alternative is not favorable, and has not been developed further in this study.

Alternatives 1, 2, and 3 each meet the District's WERS storage requirement, however Alternatives 1 and 2 do not meet the Saddleback Meadows storage requirement. Additional storage within the District is still required for the Saddleback Meadows development if Alternatives 1 or 2 are selected.

5. CONSTRUCTION CONSIDERATIONS

The three feasible alternatives (1, 2, and 3) presented in Section 4 have been further developed in this section. The three alternatives all have relatively similar impacts and challenges as described below.

5.1 CONSTRUCTION ACCESS, CONTRACTOR STAGING AREA, AND HAUL ROUTES

During construction of the new tank and demolition of the existing 0.42 MG tank construction equipment will need access to and around the construction site. The existing construction access road is single lane, 10-feet wide, with grades as steep as 16 to 17 percent. We evaluated the existing access road for access by large trailered vehicles. A program was used to simulate the following two design vehicles:

- Tractor trailer: 69-feet long x 8-feet wide and has a 50-foot turning radius
- Single unit truck: 30-feet long x 8-feet wide and has a 42-foot turning radius

Based on the results of this analysis, the larger tractor trailer cannot stay within the 20-foot limits of the access lease and cannot turn onto the access road from Live Oak Canyon. Large delivery vehicles will need to deliver materials to a staging area at the bottom of the access road, then the materials will need to be taken to the reservoir site using a smaller vehicle. This results in increased handling of materials, increased staging, and increased overall project costs. We recommend that the improvements be made and confirmed in preliminary design to widen the access road entrance at Live Oak Canyon Road to accommodate a tractor trailer delivery vehicle. If this improvement is not done the Contractor will be required to limit delivery vehicle size, resulting in additional deliveries and increased project costs.

There are portions of the access road that we recommend localized improvements to widen the roadbed to a 16-feet to accommodate the smaller single unit truck. This additional width at these localized areas are to facilitate the turning radius of the vehicle. Localized improvements to the road width as well as clearing of brush and overhanging trees is recommended and should be confirmed during the preliminary design phase of the project. Additionally, as shown on Figures 4-1.1, 4-2.1, and 4-3.1 a widened site entrance is recommended at the top of the access road near the gate. The widened sit entrance will allow a single unit truck to more easily enter the site and turn around the tanks. If the improvements are not done, then the Contractor will be required to limit the vehicle size and this will result in increased staging, increased handling of material and increased costs.

Due to the steep grade of the access road it is expected concrete trucks will not be able to carry full loads up to the site, resulting in increased construction costs.

There is an existing hiking/biking trail that crosses the access road, as shown in Figure 1-1. Coordination with the Forest Service will be required during preliminary design and construction to provide a trail detour or closure.

Three potential Contractor staging area have been identified below, and shown in Figure 5-1.

1. ***Lower staging area:*** The proposed lower staging area closes a portion of the private access road to provide approximately 6,000 square feet for Contractor staging area. A detour can be provided, as shown in Figure 5-1, through the Hamilton Oaks Private Community gates to reach the area blocked by the proposed staging area. Further coordination with the community will be required to secure this staging area. If this staging area cannot be secured the Contractor will need to find an offsite storage and staging area, increasing the cost of the overall project.

2. ***Upper staging area (east of tank):*** It is recommended that a working pad be built up to the east of the site within the lease area. This will act as a temporary laydown area for the Contractor. The Contractor will need a minimum of approximately 5,000 square feet of laydown area adjacent to the proposed tank. Assuming a 2:1 grade can be built up along the east side of the lease area, approximately 2,500 square feet of Contractor staging area can be provided. Due to the reduced staging area near the tank it is anticipated that the Contractor will be required to double handle materials, increasing the overall project costs.
3. ***Upper staging area (outside of lease boundary):*** Due to the limited working area within the lease boundary, additional Contractor laydown area, outside of the lease boundary was investigated. A flat pad can be graded to the south of Reservoir No. 1 providing the Contractor up to an additional 10,000 SF of laydown area, as shown in Figures 5-1 and 5-2. This laydown area will require the removal of approximately 4,000 cubic yards of material, but will decrease tank construction costs and increase the contractors production rate while constructing the tank. This laydown area will require a temporary construction easement from the Forest Service and should be investigated further during preliminary design.

The anticipated haul route to the site from the Interstate 5 Freeway, is north along El Toro Road, then east along Live Oak Canyon Road.

5.2 IMPACTS TO EXISTING FACILITIES

The three reservoir alternatives all have relatively similar site impacts and challenges as follows:

- Demolition of Reservoir No. 2 (0.42 MG): Each alternative requires the demolition of the existing Reservoir No. 2. In addition to the removal of the steel tank, the removal of the 6-inch altitude valve vault, 8-inch inlet piping, tank intertie piping and pump, tank overflow and drain piping will be required.
- During demolition activities the existing Reservoir No. 1 must stay in service. An isolation valve on the Reservoir No. 2 8-inch inlet/outlet pipeline and a valve on the 6-inch tank intertie can be closed to isolate the 0.42 MG Reservoir No. 2 from the system.
- Reservoir No. 2 will need to be drained before demolition. The District should plan to drain the tank to the system as much as possible to prepare for the Contractor's demolition. The Contractor will drain any remaining water through the tank's drain line to the existing surface which will sheet flow off the site.
- Overhead Electrical Line and Power Poles: Two power poles are located within the site, both to the east of the tank. A smaller power pole containing the site's electrical service will need to be relocated, as shown in the grading figures. A large transmission pole serving the site, located north of the site entrance must be protected in place. The conceptual grading figures keep a 10-foot clear buffer around the existing transmission pole, however SCE clearance requirements will need to be confirmed during preliminary design. The transmission pole serving the site contains overhead lines that go down to Live Oak Canyon Road. These overhead lines cross the site access road and will need to be considered during construction and clearance requirements will need to be coordinated with SCE. The overhead line will limit the height of the Contractor's equipment that can pass under it.
- Site fencing: The site fencing will need to be revised to enclose the larger site.
- Tree and brush pruning and/or removal is anticipated and will need to be coordinated with the Forest Service. Further investigation during primary design should be completed to determine environmental requirements.

5.3 SITE GRADING AND DRAINAGE IMPACTS

The site grading and drainage impacts for Alternatives 1, 2, and 3 are all similar and they do not significantly alter how the site is graded and drains. These three alternatives all feature a built-up pad on the north east of the site, and a widened entrance at the access gate. These features will allow for more room when constructing the tank

and provide additional useable space at the site. Overall site drainage patterns will be maintained, sending runoff away from the tanks, off site.

Alternative 2 and 3 (shown in Figures 4-2.1 and 4-2.3) feature a final grading concept with a partially buried concrete tank. In order to maintain drainage away from the tank a concrete v-ditch will need to be constructed around the northern perimeter of the tank. The concrete v-ditch will catch runoff coming towards the tank from the adjacent hillside and direct it around the tank and off site.

The amount of runoff from a new, larger tank will decrease the overall site permeability consequently increasing overall site runoff. During final design the District may be required to provide an on-site BMP to treat runoff prior to discharging it.

5.4 PIPELINE CONSTRUCTION TO LIVE OAK CANYON

The District has requested that the existing 10-inch steel pipeline located within the 20-foot wide easement from Live Oak Canyon Road up to the Harris Grade Reservoir site be upsized to a 16-inch pipeline to meet future demands. The following two conceptual alignments and cross sections were developed and shown in Figure 5-3.

- Alternative A: This alignment uses the available 10-foot wide corridor between the existing 10-inch pipeline and the edge of easement.
- Alternative B: This alignment uses the same corridor as the existing 10-inch pipeline and requires replace-in-place construction.

Both alignments have the following construction considerations:

- **Environmental:** Similar to the adjacent areas surrounding the site and access road, the existing 20-foot wide easement is covered in mature trees and brush. Before construction can begin clearing and grubbing of the existing surface will be required. During preliminary design additional environmental investigations should determine any environmental mitigation measures required during construction.

- **Pipe Construction in Slope:** The existing 20-foot wide easement extends from the Harris Grade Site down the hill to Live Oak Canyon Road. Grades on the hill side are as much as 2:1. It is recommended that concrete slope anchors are be constructed at intervals throughout the trench to hold backfill in place, and to achieve good compaction over the pipe. It is unknown if concrete slope anchors were installed on the existing 10-inch and 14-inch lines. If slope anchors were installed on the existing pipe, the Contractor may encounter them during excavation and have difficulty constructing the proposed trench.

  The geotechnical report determined that this area was susceptible to seismically induced landslides. During preliminary design additional slope stability investigations should be conducted by a geotechnical engineer to confirm any bedding and backfill, trenching, shoring, or construction requirements to mitigate seismically induced landslides.

- **Utility separation:** The ideal minimum trench-to-trench horizontal clearance from the proposed water pipeline to parallel existing utilities is 3-feet. As excavation activities get closer to existing utilities, the Contractor runs the risk of running into unstable, previously disturbed soils, resulting in the trench caving in. The 20-foot easement only allows space for a 2 foot to 2.5 foot trench to trench clearance. The minimal clearance will likely slow the Contractor's production rate, as they will need to excavate carefully to avoid impacting the adjacent trench.

- **Work area:** The ideal work area to install the proposed pipeline is approximately 24 feet wide, however the existing easement limits the work area to 20-feet. During preliminary design the District may want to investigate an additional 10 to 15 foot temporary construction easement, which will allow the Contractor additional staging and laydown area, resulting in an increased production rate and lower installation costs.

  If a temporary easement cannot be obtained the existing 20-foot easement can be utilized. The existing easement limits the available staging area for materials and slows the production rate because work will need to be sequenced.

Advantages and disadvantages to each alternative are summarized below:

Alternative A:

- Does not require removal of existing 10-inch.
- More room on the south east side of the pipe staging of materials and spoils.
- Farther away from the existing 14-inch water and therefore, a lower risk of disturbing the existing 14-inch pipe to be protected in place.
- Without the temporary easement Alternative A is only 5-feet from the edge of the existing easement. The Contractor will not have access to the north west side of the pipe trench, this will require additional sequencing of material, resulting in a slower production rate.
- Excavating in undisturbed soil, may lead to less ripable soils and less favorable production rates.

Alternative B:

- Excavation in previously disturbed soil, can lead to more favorable production rates.
- Requires removal and disposal of the existing 10-inch steel pipe.
- Typically, concrete slope anchors are constructed for pipeline construction along steep grades. It is unknown based on record drawings if concrete slope anchors were constructed over the existing 10-inch. If they were the contractor would need to remove the existing concrete slope anchors.

5.5 PERMITTING

It is anticipated that permitting and coordination with the following agencies will be required:

- County of Orange
- Regional Water Quality Control Board
- California Department of Drinking Water
- US Forest Service: Temporary construction easements will be required for Alternative 3, and the upper contractor staging area shown in Figures 4-3.1 and 5-1 (if the District elects to pursue this additional staging area).
- Environmental permits (a table of anticipated environmental requirements is given in Appendix C)

Continued permit coordination and development should continue in preliminary and final design.

5.6 CONSTRUCTION PHASING

Planning, sequencing, and phasing of construction activities will be critical to keep the Reservoir No. 1 in service during construction. In general, the following construction sequencing is recommended.

1. Site access road improvements: Tree and brush removal and pruning along the access road to accommodate construction vehicles.
2. Site preparation: clearing of the site and preparing the site for grading activities.

3. Construct piping modifications to Reservoir No. 1: Install altitude valve on inlet piping; remove pump and abandoned equipment.
4. Close valves and isolate Reservoir No. 2 from the system.
5. Demolish Reservoir No. 2 and appurtenances.
6. Construct temporary shoring/retaining walls and site grading.
7. Construct new tank, onsite piping, new 16-inch pipe to Live Oak Canyon Road, valving, drains, overflow, electrical, etc.
8. Construct the tank intertie connection and connect the new 16-inch pipeline to Live Oak Canyon Road to the existing 14-inch.
9. Disinfect and hydrotest new tank.
10. Fill tank and bring new reservoir online.
11. Complete final site grading, landscaping, and miscellaneous site work.

Further refinement of the construction sequencing and phasing should be undertaken during the preliminary and final design phases of this project.

5.7 CONSTRUCTION DURATION

Each alternative is anticipated to have a similar construction duration. The construction duration of this project is expected to require approximately 24 months with the following required durations:

1. Site preparation and clearing of access road – 1 month
2. Reservoir No. 1 piping modifications – 2 months
3. Demolition of Reservoir No. 2 – 2 months
4. Reservoir construction, including grading operations, shoring, piping and appurtenances, and pipeline construction to Live Oak Canyon Road – 15 months
5. Piping connections – 2 weeks
6. Reservoir disinfection and testing – 2 weeks
7. Final grading, site work, landscaping, and miscellaneous work – 2 months

5.8 RESERVOIR TYPE

The reservoir types under consideration in this study are:

1. Circular pre-stressed (wire-wrapped) concrete reservoir per AWWA D110
2. Welded steel reservoir per AWWA D100

A welded steel reservoir is not feasible for Alternatives 2 and 3 because the conceptual final grading plan includes a partially buried tank. Steel tanks are typically are only buried if the loading can be distributed equally around the tank. In these alternatives the partially buried, north portion of the tank would have additional dead load on the tank wall. A welded steel reservoir is only feasible for Alternative 1. The structural/construction advantages and disadvantages of the two reservoir types are listed below:

Table 5 – Reservoir Type Advantages and Disadvantages

	Prestressed Concrete Reservoir	Steel Reservoir
Construction Cost	Higher capital cost	Lower capital cost
Useful Life	75 to 100 years	50 to 75 years
Maintenance Cost	Lower maintenance cost	Typically higher maintenance (re-painting tank outside; re-coating inside surfaces; and replacement of underside floor cathodic protection and interior anodes)

Table 5 – Reservoir Type Advantages and Disadvantages		
Water Quality	In an unmixed tank 9-inch to 12-inch thick walls provide enhanced insulation, keeping water cooler and a more consistent temperature within the tank	In an unmixed tank thinner walls result in warmer water and dead zones near the top of the tank, leading to poor tank circulation and water quality issues.
Fire Resistance	Enhanced fire resistance	More susceptible to fire damage
Appurtenances	Tank connections are below grade through the reservoir floor slab. This leaves more useable space above the site for vehicle access around the tank.	Tank connections are above grade through the reservoir wall. This leaves less space for vehicle access round the tank.

6. CONSTRUCTION COST

Construction cost estimates were prepared for each of the four feasible alternatives and are presented in the table below.

Table 6 – Reservoir Alternative Cost Analysis

Alternative	Estimated Construction Cost
1A – 1.7 MG Steel Tank	$4,500,000
1B – 1.7 MG Concrete Tank	$5,100,000
2 – 2.0 MG Concrete Tank	$7,100,000
3 – 2.7 MG Concrete Tank	$7,900,000

The cost estimates above include a 30% contingency.

7. ALTERNATIVES ANALYSIS

The advantages and disadvantages of each of the three reservoir siting alternatives are presented below.

Table 7 – Alternative Analysis

Alternative	Advantages	Disadvantages	Construction Cost
1A/1B – 1.7 MG Steel or Concrete Tank (Material Analysis in Table 5)	1. Requires least amount of temporary grading/shoring 2. More contractor work area is available at the site 3. Largest feasible steel tank 4. Temporary construction easements from USFS are not required	1. Does not meet minimum storage requirement, additional storage at Saddleback Development is required	$4,500,000 (Steel) $5,100,000 (Concrete)
2 – 2.0 MG Concrete Tank	1. Temporary construction easements from USFS are not required 2. Requires less grading/shoring than Alternative 3.	1. Does not meet minimum storage requirement, additional storage at Saddleback Development is required 2. Steel tank not feasible	$7,100,000
3 – 2.7 MG Concrete Tank	1. Meets minimum storage requirement	1. Requires temporary construction easement from USFS 2. Requires the most amount of temporary grading and shoring 3. Steel tank not feasible	$7,900,000

8. CONCLUSION AND RECOMMENDATION

To be completed in the final document, after discussions with the District.

Appendix A. Geotechnical Report

PRELIMINARY GEOTECHNICAL EXPLORATION REPORT
TRABUCO CANYON WATER DISTRICT
HARRIS GRADE RESERVOIR REPLACEMENT
FEASIBILITY STUDY
18975 LIVE OAK CANYON ROAD
TRABUCO CANYON, ORANGE COUNTY, CALIFORNIA

Prepared for:

TETRA TECH, INC.

17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Project No. 12753.001

June 18, 2020

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

June 18, 2020

Project No. 12753.001

Tetra Tech, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Attention: Mr. Kyle Bohn, PE

Subject: Preliminary Geotechnical Exploration Report
Trabuco Canyon Water District
Harris Grade Reservoir Replacement Feasibility Study
18975 Live Oak Canyon Road
Trabuco Canyon, Orange County, California

In accordance with your request, Leighton Consulting, Inc. has performed a preliminary geotechnical exploration as your subconsultant for the Trabuco Canyon Water District (District) Harris Grade Reservoir Replacement Feasibility Study. This report is prepared in accordance with our revised proposal dated January 29, 2019, and information provided by you.

Earth materials encountered during the field exploration consisted mostly of bedrock of the Silverado Formation (clayey sandstone, sandstone and siltstone). At the southern portion of the site, Quaternary-aged alluvium/colluvium consisting of medium stiff clay and medium dense to dense clayey sand was encountered to a depth of 25 feet. Groundwater was not encountered in any of our borings drilled to a maximum depth of 41 feet below the existing grade.

Geotechnical aspects of the site that should be considered in the feasibility study include potential for seismically-induced landslides on the northerly and westerly slopes, the presence of undocumented fill and alluvium/colluvium at the southern portion of the site, and the potential presence of hard rock concretions within the bedrock if deep excavations are planned.

17781 Cowan ▪ Irvine, CA 92614-6009
949.250.1421 ▪ 949.250.1114 Fax

The proposed project is feasible from a geotechnical standpoint, provided the findings and preliminary recommendations presented in this report are considered in development of the project plan and preliminary design. Additional subsurface exploration and analysis may be required when a site plan is available to verify the geotechnical conditions throughout the site are generally consistent with the conditions encountered during our limited field exploration. This report presents the results of our field exploration, laboratory testing, and geotechnical analyses, and provides our preliminary recommendations for the proposed project.

Our professional services were performed in accordance with the prevailing standard of professional care as practiced by other geotechnical engineers in the area. We do not make any warranty, either expressed or implied. The report may not be used by others or for other projects without the expressed written consent of our client and our firm.

We appreciate the opportunity to work with you on this project. If you have any questions or if we can be of further service, please contact us at your convenience.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Christian Delgadillo, PE, GE 3144
Senior Project Engineer

Jeff Pflueger, PG, CEG 2499
Associate Geologist

Reviewed by:

Djan Chandra, PE, GE 2376
Senior Principal Engineer

CD/DJC/JMP/lr

Distribution: (1) Addressee

Leighton

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1.0 INTRODUCTION

1.1 Site Location and Proposed Project

The Harris Grade Reservoir site is located in the unincorporated community of Trabuco Canyon in the foothills of the Santa Ana Mountains in eastern Orange County. The site location (latitude N33.6869° and longitude W117.6061°) and immediate vicinity is shown on Figure 1, *Site Location Map.*

The project site is occupied by a 2.0 million gallon (MG) steel reservoir built in 1981 and a 0.42 MG steel reservoir built in 1965. The site for the existing facility appears to have been partially cut down into the ridgelines on the northern and southwestern sides of the existing reservoirs.

The District plans to replace the 0.42 MG reservoir with a new 2.0 to 2.55 MG reservoir and upgrade the inlet/outlet pipe leading up the slope to the site in a northeasterly direction from Live Oak Canyon Road.

1.2 Purpose and Scope of Exploration

The purpose of our preliminary geotechnical exploration was to evaluate the subsurface conditions and general soil/bedrock characteristics at the project site in order to assist Tetra Tech in identifying project constraints and preparation of preliminary layouts of the new reservoir. The scope of this exploration included the following tasks:

- *Background Review* – A background review was performed of readily available, relevant geotechnical and geological literature pertinent to the site. References reviewed in preparation of this report are listed in Section 4.0.

- *Pre-Field Exploration Activities* – Exploration locations were coordinated with Tetra Tech and the District, and marked in the field. Underground Service Alert (USA) was then notified to locate and mark existing underground utilities prior to our subsurface exploration.

- *Field Exploration* – We advanced two hollow-stem auger borings (LB-1 and LB-2) to depths ranging from 33 to 41 feet below existing grade on May 7, 2020. Both borings were terminated due to auger refusal. The approximate boring locations are shown on Figure 2, *Boring Location Map*. The borings were geotechnically logged and sampled using Standard Penetration Test (SPT) and

California Ring samplers at selected intervals. The SPT and Ring samplers were driven with a 140-pound hammer, free falling 30 inches. The number of blows was noted for every 6 inches of sampler penetration. Relatively undisturbed samples were collected from the borings using the Ring sampler. The sampling procedures generally followed ASTM D 1586 for SPT and D 3550 for split-barrel ring sampling. In addition to driven samples, representative bulk soil samples were also collected from the borings. Each sample collected was described in general conformance with the Unified Soil Classification System (USCS). The samples were sealed, packaged, and transported to our laboratory for testing. The soil and bedrock descriptions and depths are noted on the boring logs included in Appendix A, *Boring Logs*.

- *Laboratory Tests* – Laboratory tests were performed on selected soil and bedrock samples obtained during our field investigation. The laboratory testing program was designed to evaluate the physical and engineering characteristics of the onsite soil and bedrock. Tests performed during this exploration include:

  - Moisture Content and Dry Density (ASTM D 2216 and ASTM D 2937);
  - Consolidation (ASTM D 2435);
  - Direct Shear (ASTM D 3080);
  - R-Value (California Test Method 301); and
  - Corrosivity Suite – pH, Sulfate, Chloride, and Resistivity (California Test Methods 417, 422, and 643).

  Results of moisture content and dry density testing are presented on the boring logs in Appendix A. Other laboratory test results are presented in Appendix B, Laboratory Test Results.

- *Engineering Analysis* - The data obtained from our background review, field exploration, and laboratory testing program were evaluated and analyzed to develop the preliminary recommendations presented in this report for the proposed project.

- *Report Preparation* - The results of the exploration are summarized in this report presenting our findings, conclusions and recommendations.

2.0 FINDINGS

2.1 Geologic Setting

Regionally, the subject property lies within the central northwesterly portion of the Peninsular Ranges Geomorphic Province of California, one of eleven distinctly separate areas designated within the general boundaries of California. The provinces are defined on the basis of similarities in their topographic, geomorphic, tectonic and other geologic characteristics. The Peninsular Ranges are composed of an uplifted, westerly-tilted structural block that is manifest in an alternating series of northwest-trending mountain ranges and intervening valleys. Locally, the subject site lies within an area of foothills that flank the southwestern margin of the Santa Ana Mountains.

While the Santa Ana Mountain range is underlain by cretaceous age batholithic and metasedimentary bedrock units, the foothills are underlain by a well-mapped sequence of marine to non-marine sedimentary geologic formations of Cenozoic age through Quaternary age.

Three major northwest-trending blocks are recognized within the province, which are separated by major active paralleling fault systems including the Whittier-Elsinore Fault Zone, Newport-Inglewood Fault Zone, and the San Jacinto and San Andreas Fault systems. While interior areas of the structural blocks contain numerous faults, including the nearby Cristianitos and Mission Viejo faults, they are not classified as active by the California Geologic Survey (Bryant and Hart, 2007).

2.2 Surficial Geology

The site is mapped to be underlain by sedimentary bedrock of the Tertiary age Silverado Formation (Morton and Miller, 2006; Schoellhamer et al., 1981). This formation is mapped as a narrow zone of bedrock at the site in fault contact to the north and south with Cretaceous-age bedrock units and other Tertiary-age bedrock units trending in a northwest-southeast direction consistent with the ridgeline located immediately south of the existing reservoirs. The inclination of the bedrock is steeply dipping (roughly 50 degrees from horizontal) and is reported to have been overturned due to local tectonic movement. An overview of regional geology of the area is presented on Figure 3, *Regional Geology Map.*

2.3 Subsurface Conditions

Geologic units encountered in the borings at this site consist of undocumented artificial fill, Quaternary-aged alluvium/colluvium and Tertiary age Silverado Formation bedrock, as described in the following sections. Variations in subsurface geologic materials should be considered. Care should be exercised in interpolating or extrapolating geologic conditions between or beyond borings as the bedrock and soils generated from weathering of the units can vary widely with respect to geotechnical properties.

Artificial Fill (Af): The fill encountered in our borings varied from approximately 1 to 6 feet in thickness, and consisted generally of grayish brown and olive brown clay and sandy clay. The fill material is assumed to have been placed during grading of the existing reservoir site and associated improvements. Localized deeper accumulations of fill associated with the development of the site should be anticipated.

Quaternary Alluvium/Colluvium (Qa/Qcol): Alluvium/colluvium was encountered in the southern portion of the site in boring LB-2 at approximately 6 feet deep below existing grade, and consisted of brown and olive brown, medium stiff clay and medium dense to dense clayey sand. The alluvium/colluvium extends to a depth of approximately 25 feet below existing grade at the location of boring LB-2.

Silverado Formation (Tsi): Bedrock of the Silverado Formation underlies the site at depths varying from 1 to 25 feet. The Silverado Formation consists of non-marine and marine basal conglomerate overlain by relatively thin sequence of sandstone and siltstone. As encountered in our borings, the Silverado Formation generally consisted of yellow brown, olive reddish brown and blue-gray, fine- to medium-grained sandstone, clayey sandstone, and siltstone. Minor conglomerate lenses and locally hard and cemented zones should be anticipated within the formation.

2.4 Groundwater

Groundwater was not encountered during our field exploration to a maximum depth of 41 feet. Since the project site is located in an area mapped to be underlain by sedimentary bedrock, there is no historic high groundwater level information available for the site (CGS, 2002a). Groundwater may exist at greater depths in more granular layers of bedrock or in fractures within the bedrock. Based on our

field exploration and our experience in the project vicinity, groundwater is not anticipated to adversely impact the proposed project.

Fluctuations of the groundwater level, localized zones of perched water, and an increase in soil moisture should be anticipated during and following the rainy seasons or periods of locally intense rainfall or storm water runoff.

2.5 Expansive Soil Characteristics

Based on our exploration, the near-surface onsite soils are variable and generally consist of sand, clayey sand and sandy clay. Expansion Index (EI) testing conducted on a representative bulk sample of the near-surface onsite soils from boring LB-2 (i.e. upper 5 feet below ground surface) yielded an EI of 32 (see Appendix B). The expansion potential of the near-surface onsite soils is considered to be low; however, variability in the expansion potential of the near-surface onsite soils should be anticipated.

2.6 Soil Corrosivity

In general, soil environments that are detrimental to concrete have high concentrations of soluble sulfates and/or pH values of less than 5.5. Soils with chloride content greater than 500 ppm per California Test 422 are considered corrosive to steel, either in the form of reinforcement protected by concrete cover or plain steel substructures, such as steel pipes. Additionally, soils with a minimum resistivity of less than 1,000 Ohm-cm are considered corrosive to ferrous metal (Caltrans, 2018). Corrosivity test results are included in Appendix B of this report and summarized in Table 1.

Table 1 – Summary of Corrosivity Test Results

Test Parameter	Test Results	General Classification of Hazard
Water-soluble sulfate content	49 to 53 ppm	Negligible sulfate exposure to buried concrete (per ACI 318-14)
Water-soluble chloride Content	40 to 110 ppm	Non-corrosive to buried concrete (per Caltrans Specifications)
pH	7.2 to 8.0	Neutral to moderately alkaline, relatively passive to buried metals
Minimum resistivity (in saturated condition)	1,260 to 1,498 Ohm-cm	Non-corrosive to buried ferrous pipes (per Caltrans Specifications)

Based on the laboratory test results, the near-surface (upper 5 feet) soils at the site exhibit “negligible” potential for sulfate attack on concrete, and have low corrosion potential to buried ferrous metal in direct contact with the soils.

2.7 Rippability

Bedrock of the Silverado Formation (Tsi) was encountered in borings LB-1 and LB-2 at depths of 1 and 25 feet, respectively. However, refusal of the 8-inch diameter hollow-stem auger was encountered in both borings LB-1 and LB-2 at depths of 41 and 33 feet, respectively.

The near-surface bedrock can generally be excavated using conventional heavy-duty earth moving equipment in good working order. Localized hard and cemented zones may also exist and should be expected. As such, excavation difficulties should be anticipated where deeper excavations are planned into the bedrock. These localized areas may require special ripping techniques such as jackhammers or other percussion device and may produce oversized material that will require processing if the material is to be used as general site fill for structural support.

2.8 Faulting and Seismicity

Our review of available in-house literature indicates that there are no known active or potentially active faults traversing the site and the site is not located within a State of California designated Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007). The principal seismic hazard that could affect the site is ground shaking resulting from an earthquake occurring along any one of several major active faults in the region. Known regional active faults that could produce significant ground shaking at the site include the Whittier-Elsinore, San Joaquin Hills Blind Thrust and Chino faults located approximately 7.1 miles, 8.5 miles and 9.7 miles, respectively, from the site. The San Andreas fault is the largest fault in the region and is located approximately 38 miles from the site. Major regional faults with surface expression in proximity to the site are shown on Figure 4, *Regional Fault Map*.

The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, the distance from the source, and the site response characteristics. Peak horizontal ground accelerations are generally used to evaluate the intensity of ground motion. Using the SEAOC/OSHPD Seismic

Design Maps Tool (https://seismicmaps.org/) to obtain seismic design parameter values from the United States Geological Survey (USGS), the peak ground acceleration for the Maximum Considered Earthquake (MCE_G) adjusted for the Site Class effects (PGA_M) is 0.61g. Based on the USGS online interactive deaggregation program (USGS, 2020a), the modal seismic event is Moment Magnitude (M_W) 6.5 at a distance of 13 miles.

2.9 Secondary Seismic Hazards

Secondary seismic hazards in the region could include soil liquefaction and associated surface manifestations, earthquake-induced landsliding and flooding, seiches, and tsunamis. The potential for these secondary seismic hazards at the site is discussed below.

Liquefaction Potential - Review of the Seismic Hazard Zone Map for the Santiago Peak 7.5 Minute Quadrangle (CGS, 2002b) indicate the subject site is not located within an area that has been identified by the State of California as being potentially susceptible to the occurrence of liquefaction (see Figure 5, *Seismic Hazard Map*). In addition, the presence of relatively shallow bedrock and lack of groundwater at the site also indicate that the liquefaction potential is very low.

Seismically-Induced Landslides - Review of the Seismic Hazard Zone Map for the Santiago Peak 7.5 Minute Quadrangle (CGS, 2002b) indicate that the western portion of subject site and the northerly ascending slope are located within an area that has been identified by the State of California as being potentially susceptible to the occurrence of seismically-induced landslides (see Figure 5). Therefore, the potential for seismically-induced landslides exists at the site and should be further evaluated once a site plan is developed for the project. Additional subsurface exploration and analysis may be required to evaluate slope stability and the potential for seismically-induced landslides.

Earthquake-Induced Flooding - Earthquake-induced flooding can be caused by failure of water-retaining structures as a result of earthquakes. According to the California Department of Water Resources Division of Safety of Dams (DSOD) Dam Breach Inundation Maps website (https://fmds.water.ca.gov/maps/damim/), the site is not located within an inundation area for dam failure. With regard to the subject site, the potential for earthquake-induced flooding depends on conditions and design of the existing reservoirs. The potential for earthquake-induced flooding

may exist if the existing reservoirs do not meet the current seismic design standards.

Seiches and Tsunamis - Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Under certain seismic conditions, a seiche could form within the newly constructed and existing reservoirs. The new reservoir should be designed to meet the current code for seismic requirements to reduce the potential for a seiche. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. Based on the inland hilltop location of the site, tsunami risks at the site are not a consideration.

3.0 PRELIMINARY RECOMMENDATIONS

Based on our study, the proposed project is feasible from a geotechnical standpoint. Presented below are the preliminary geotechnical recommendations for the project. Additional subsurface exploration and analysis may be required once a site plan is developed and the recommendations may need to be revised and/or amended.

3.1 Site Grading

The northern portion of the site by boring LB-1 is underlain by a thin layer of fill and bedrock. If the new reservoir is located in this area and the finish pad elevation is at or close to the existing elevation, minor grading is required for site preparation and the reservoir foundation is expected to be supported entirely on bedrock. Shallow fill or alluvium/colluvium, if exposed within the reservoir footprint, may be removed and replaced with two sack sand/cement slurry or the foundation may be partially deepened to bedrock. Localized hard concretion of the bedrock may be encountered if deep excavations are planned. Depending on the footprint and layout of the new reservoir, a retaining wall may be needed at the toe of the ascending slope to the north and the reservoir may encroach into the landslide susceptibility zone. Moving the reservoir to the east is favorable from a slope stability standpoint but it would require placement of roughly 10 to 20 feet of fill to achieve the pad grade of the existing reservoirs.

Placing the new reservoir on the southern portion of the site would require cuts on the order of 10 to 20 feet into the existing ascending ridgeline that is located to the south. It would also require removal and recompaction of the existing fill and unsuitable alluvium/colluvium. The depth of removal is expected to be 5 to 10 feet below the existing grade.

The onsite soils are suitable for use as compacted structural fill provided that they are free of organic material, construction debris, and oversized materials larger than 6 inches. Imported fill soil, if any, should be noncorrosive with Expansion Index less than 50 and be approved by the geotechnical engineer prior to placement as fill. Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned to at least 2 to 4 percentage points above optimum moisture content, and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D 1557.

3.2 Foundation Design Parameters

The proposed reservoir may be supported on a mat foundation system bearing on either undisturbed, competent bedrock or compacted fill. Appurtenant structures such as office/equipment building may be supported on a conventional shallow foundation system such as spread footings bearing on undisturbed, competent bedrock or compacted fill.

Mat Foundation – Mat foundation bearing on undisturbed, competent bedrock or properly compacted structural fill may be designed using a maximum allowable bearing capacity 3,000 psf and a modulus of subgrade reaction of 150 pounds per cubic inch (pci). Total and differential settlements of the mat foundation due to the static loads are expected to be on the order of 1 inch and ½ over a distance of 30 feet, respectively. The bearing capacity may be increased by one-third for wind or seismic loading. The mat foundation should have a thickened edge of at least 12 inches below the lowest adjacent grade.

Conventional Shallow Foundation – Conventional shallow foundations may be used to support the loads of other proposed structures. Footings should have a minimum embedment depth of 12 inches and a minimum width of 12 inches. An allowable bearing pressure of 2,200 psf may be used based on the minimum embedment depth and width. The allowable bearing value may be increased by 300 psf per foot increase in depth or width to a maximum allowable bearing pressure of 3,000 psf. The allowable bearing pressures are for the total dead load and frequently applied live loads and may be increased by one third when considering loads of short duration, such as those imposed by wind and seismic forces. The allowable bearing pressures are net values; the weight of the footing may be neglected for design purposes. All continuous footings should be reinforced with top and bottom steel to provide structural continuity and to permit spanning of local irregularities.

The recommended allowable bearing capacity for shallow footings is generally based on a total allowable static settlement of 1 inch. Since settlement is a function of footing size and contact bearing pressure, differential settlement can be expected between adjacent columns or walls where a large differential loading condition exists. The differential settlement Is expected to be less than approximately ½ inch, assuming no more than 50 percent variation in dead plus sustained live load between adjacent columns.

Lateral Load Resistance – Resistance to lateral loads will be provided by a combination of friction between the soils and foundation interface and passive pressure acting against the vertical portion of the foundation. A friction coefficient of 0.35 may be used at the soil-concrete interface for calculating the sliding resistance. A passive pressure based on an equivalent fluid pressure of 390 pounds per cubic foot (pcf) may be used for calculating the lateral passive resistance. The lateral passive resistance can be taken into account only if it is ensured that the soils against embedded structures will remain intact with time. The above values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

3.3 Slab-On-Grade

Concrete slabs-on-grade subjected to special loads should be designed by the structural engineer. Where conventional light floor loading conditions exist, the following minimum recommendations for conventional slabs-on-grade should be used. More stringent requirements may be required by local agencies, the structural engineer, the architect, or the CBC.

- A minimum slab thickness of 5 inches. Slab reinforcement should be designed by the structural engineer but as a minimum should consist of No. 3 rebar placed at 24 inches on center in each direction and provided with adequate concrete cover.

- A vapor barrier, 10-mil or thicker, should be placed below slabs where moisture-sensitive floor coverings or equipment is planned. The vapor barrier should be properly sealed at all joints and any penetrations.

- To reduce the potential for excessive cracking, concrete slabs-on-grade should be provided with construction or weakened plane joints at frequent intervals. Joints should be laid out to form approximately square panels.

- The subgrade soil should be wetted prior to placing the vapor barrier, steel, or concrete.

Our experience indicates that use of reinforcement in slabs can generally reduce the potential for drying and shrinkage cracking. Some cracking should be expected as the concrete cures. Minor cracking is considered normal; however, it is often aggravated by a high water/cement ratio, high concrete temperature at the

time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low slump concrete can reduce the potential for shrinkage cracking.

3.4 Lateral Earth Pressures

Retaining walls may be backfilled with onsite or imported non-expansive soils. The following lateral earth pressures may be used for the design of retaining walls with a level backfill.

Table 2 – Equivalent Fluid Pressure

Condition	Level Backfill
Active	37 pcf
At-Rest	57 pcf
Passive	390 pcf (Maximum of 3,900 psf)

Walls retaining bedrock may be designed using active lateral earth pressures of 29 pcf and 38 pcf for level and 2:1 (horizontal:vertical) slope, respectively.

Walls retaining more than 6 feet of soil should consider a seismic earth pressure increment with an inverted triangular distribution of 22 psf/foot in addition to the active earth pressure provided above. The above values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

Cantilever walls that are designed to yield at least 0.001H, where H is equal to the wall height, may be designed using the active condition. Rigid walls and walls braced at the top should be designed using the at-rest condition.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure or traffic loading, should be considered in the design of the retaining wall.

Lateral earth pressure design parameters recommended above are based upon drained conditions. Design and construction of the walls will, therefore, require some form of permanent subsurface drainage system behind the wall. If no drainage is provided, hydrostatic pressure should be considered in the wall design.

3.5 Seismic Design Parameters

Design parameters for minimum seismic load based on the 2019 California Building Code are included in Table 3 below.

Table 3 - 2019 CBC Based Seismic Design Parameters (Mapped Values)

Categorization/Coefficient	Design Value
Site Latitude	33.6869°
Site Longitude	-117.6061°
Site Class	C
Mapped Spectral Response Acceleration at Short Period (0.2 sec), S_S	1.424g
Mapped Spectral Response Acceleration at Long Period (1 sec), S_1	0.501g
Short Period (0.2 sec) Site Coefficient, F_a	1.2
Long Period (1 sec) Site Coefficient, F_v	1.499
Adjusted Spectral Response Acceleration at Short Period (0.2 sec), S_{MS}	1.708g
Adjusted Spectral Response Acceleration at Long Period (1 sec), S_{M1}	0.751g
Design Spectral Response Acceleration at Short Period (0.2 sec), S_{DS}	1.139g
Design Spectral Response Acceleration at Long Period (1 sec), S_{D1}	0.501g
Mapped Geometric Mean MCE_G Peak Ground Acceleration, PGA	0.509g
Site Coefficient, F_{PGA}	1.2
PGA adjusted for Site Class, $PGA_M = F_{PGA}$ *PGA	0.611g

3.6 Pavement Design

New pavements for the subject project may be constructed using conventional asphalt concrete (AC) over aggregate base (AB). We have designed the pavement sections using a design R-value of 10 for different Traffic Indices (TI) and the minimum pavement thickness is presented in Table 4 below. The pavement design was performed using the method in the *Caltrans Highway Design Manual*.

Table 4 - Pavement Sections

Traffic Index	Flexible Pavement (inches)	
	AC	AB
5 or less	4	7
6	4½	10½
7	5	12½

Concrete pavement, if used, may consist of 6 inches of Portland Cement Concrete (PCC) over 6 inches of AB. Because concrete will crack, the PCC pavement sections should be provided with crack-control joints spaced no more than 10 feet on-center each way, to control where cracks develop. As a minimum, we suggest concrete pavement be reinforced using No. 3 rebar, 18 inches on center in both directions, placed at mid-thickness. Concrete reinforcement should be designed by the structural engineer for appropriate loading conditions.

3.7 Cement Type and Corrosion

Based on the results of laboratory testing, concrete structures in contact with the onsite soil are expected to have negligible exposure to water-soluble sulfates in the soil. Common Type II cement may be used for concrete construction onsite and the concrete should be designed in accordance with CBC requirements. However, Type V cement should be used for concrete expected to be in contact with recycled water.

Based on our laboratory testing, the onsite soils are not considered corrosive to ferrous metals.

3.8 Surface Drainage

Ponding of water adjacent to structures should be avoided. During and after construction, positive drainage should be provided to direct surface water away from structures towards suitable, non-erosive drainage devices. Drainage of surface water away from the proposed structures should be provided by adequate slopes to all graded and paved surfaces. Where good surface drainage is not possible, subdrains should be provided, such as within planter areas to prevent accumulation of water within the upper soils.

3.9 Future Geotechnical Investigation

Findings and recommendations presented in this report are preliminary based on the information gained from our limited field exploration and review of available documents as well as our understanding of the current project plan. The nature of many sites is such that differing geotechnical or geological conditions can occur within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. A supplemental geotechnical investigation may be necessary during future phase of the project to develop

additional recommendations and update the preliminary recommendations in this report based on the actual soil condition and any modification of the current plans.

Future field exploration may consist of exploratory borings to verify the geotechnical conditions throughout the site are generally consistent with the conditions encountered during our limited field exploration. The borings may include a bucket auger boring downhole logged by a Certified Engineering Geologist to further evaluate slope stability and the potential for seismically-induced landslides. California Ring and Standard Penetration Test (SPT) samples should be obtained at selected depth intervals within the borings. Laboratory testing should be performed on the collected soil samples to determine the in-place moisture and density, consolidation and strength characteristics, corrosion potential, and R-value for pavement design. Site-specific recommendations for design and construction of the proposed project should be developed based on geotechnical analyses of the borings and laboratory test results.

4.0 REFERENCES

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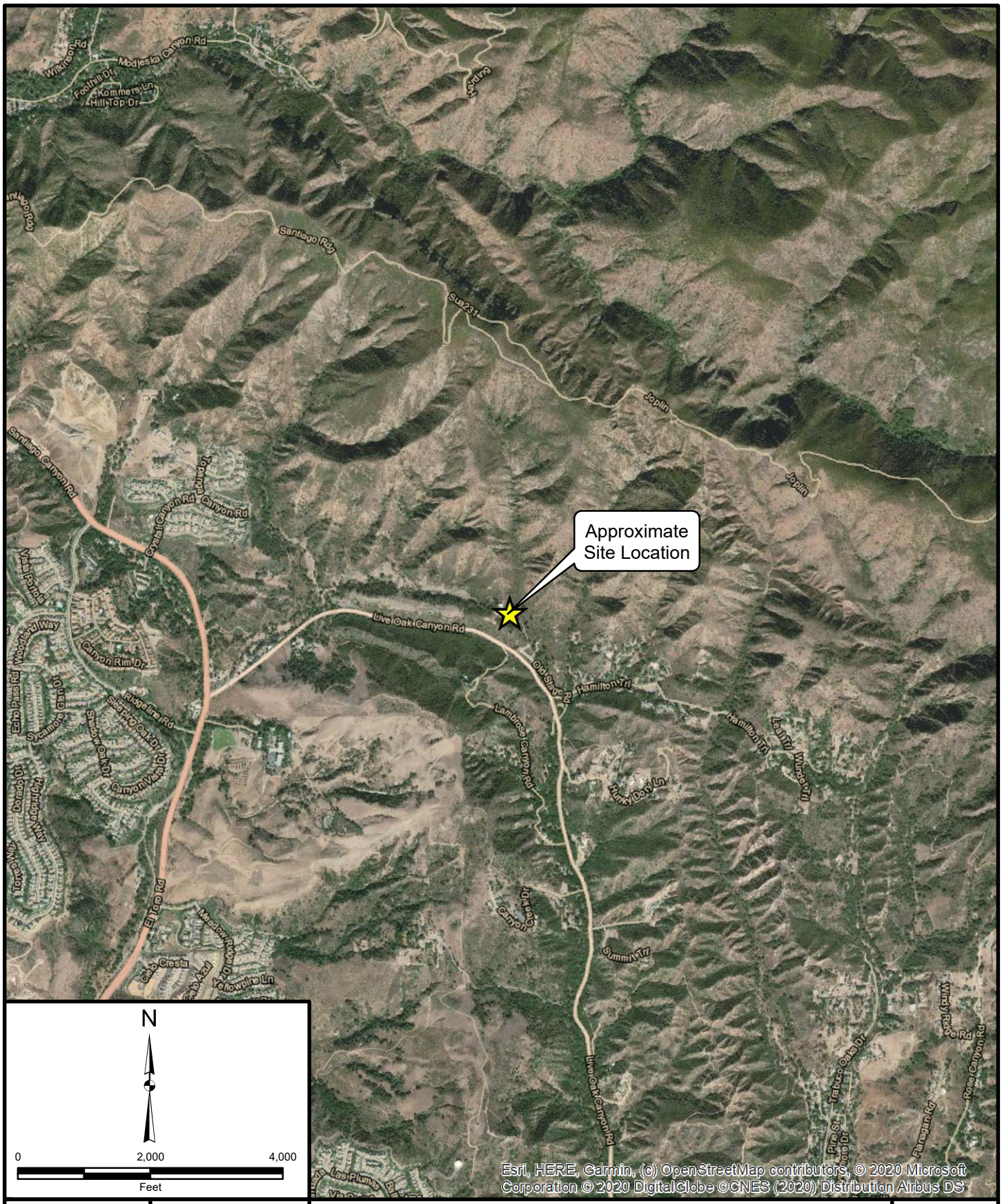

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Scale:1 " = 2,000 '	Date: June 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

SITE LOCATION MAP

Harris Grade Reservoir Replacement
18975 Live Oak Canyon Road
Trabuco Canyon, California

Figure 1

Leighton

Map Saved as V:\Drafting\12753\001\Maps\2753-001_F01-SLM_2020-06-10.mxd on 6/9/2020 4:45:27 PM

Project: 12753.001	Eng/Geol: DJC/JMP
Scale:1 " = 50 '	Date: June 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

BORING LOCATION MAP

Harris Grade Reservoir Replacement
18975 Live Oak Canyon Road
Trabuco Canyon, California

Figure 2

Leighton

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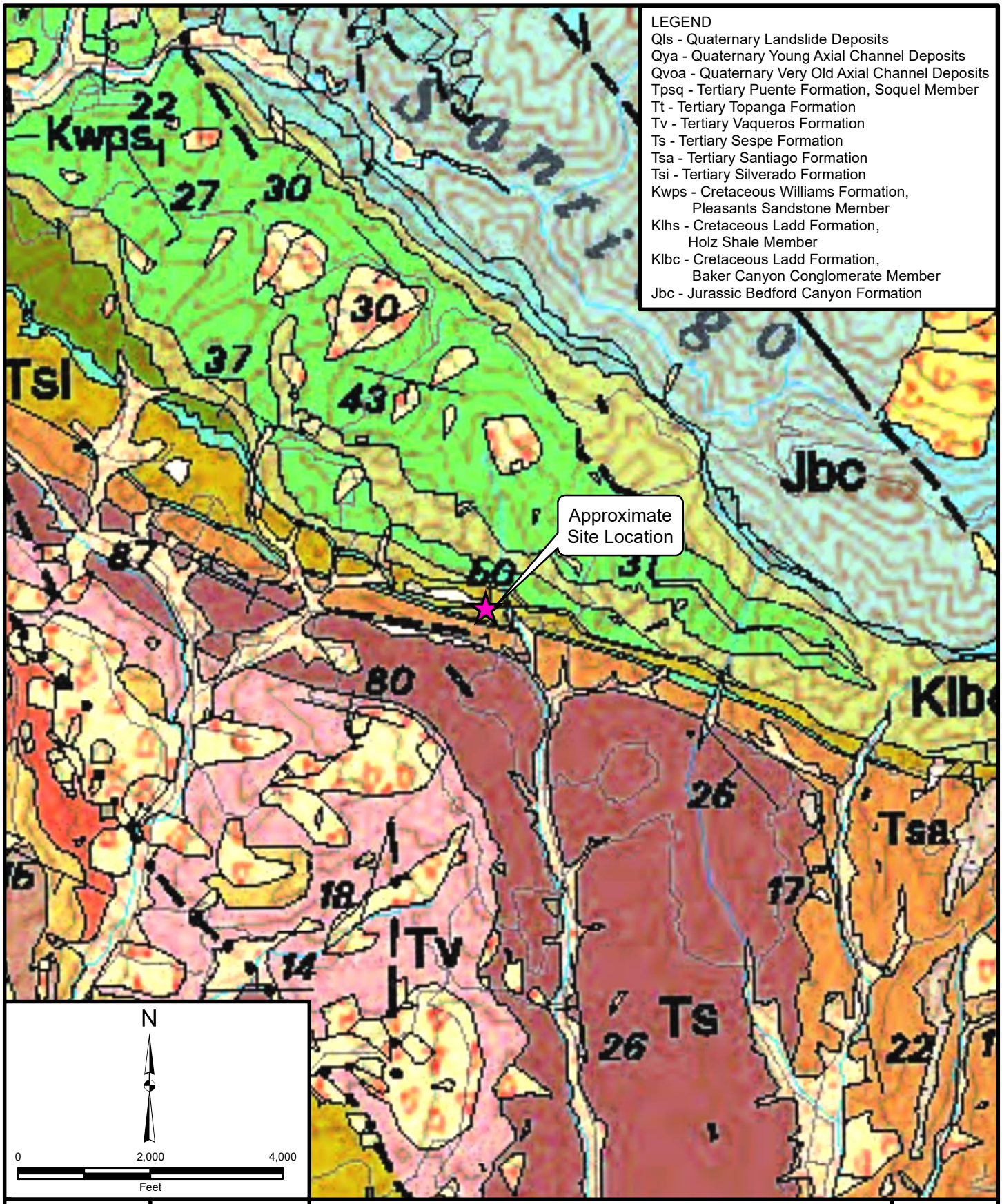


Project: 12753.001	Eng/Geol: DJC/JMP
Scale:1 " = 2,000 '	Date: June 2020

Base Map: Geologic Map of The San Bernardino and Santa Ana Quadrangles, California.
Compiled by Douglas M. Morton and Fred K. Miller
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (btran)

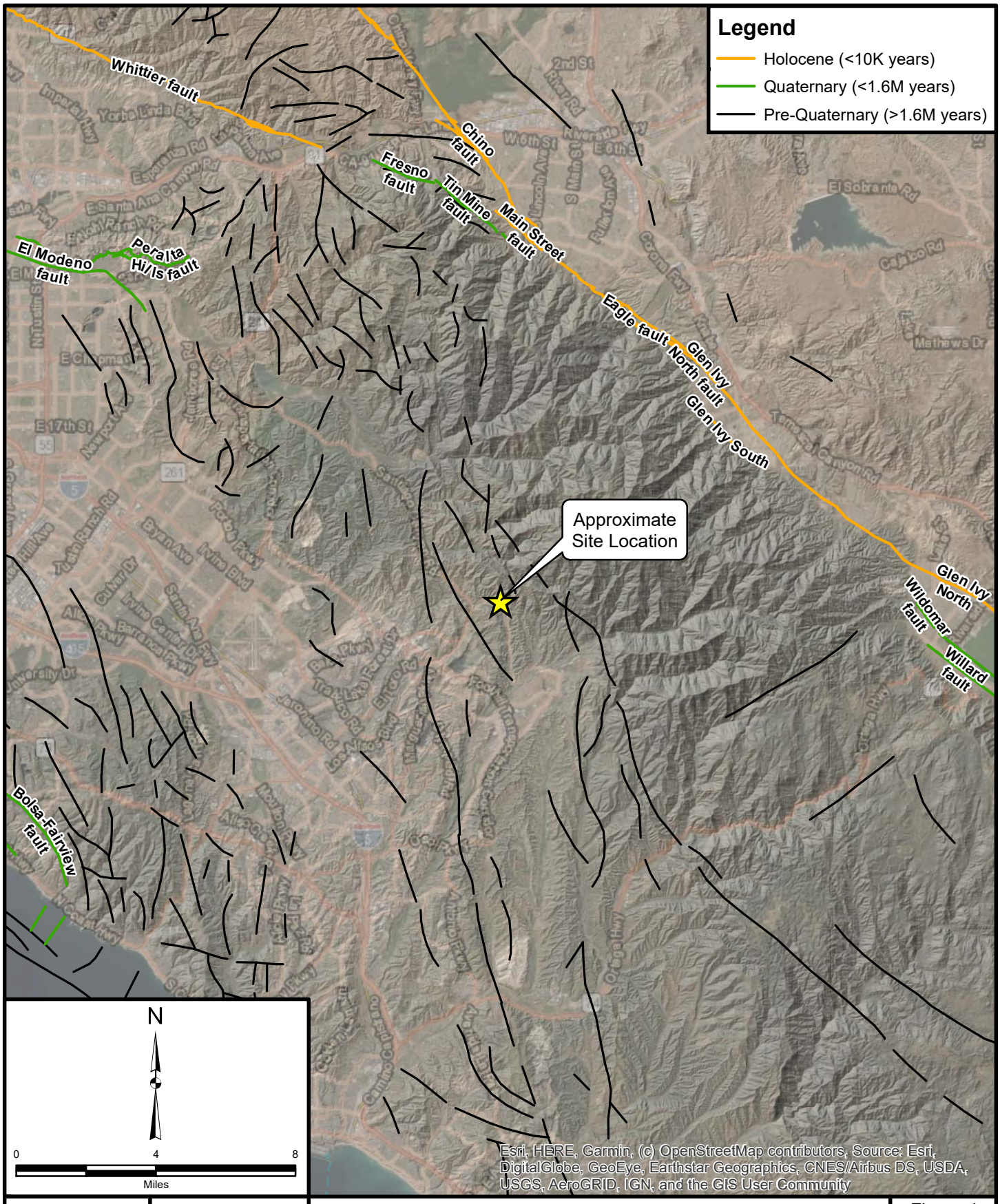
REGIONAL GEOLOGY MAP

Harris Grade Reservoir Replacement
18975 Live Oak Canyon Road
Trabuco Canyon, California

Figure 3

Leighton

Map Saved as V:\Drafting\12753\001\Maps\12753-001_F03-RGM_2020-06-15.mxd on 6/11/2020 3:36:01 PM



Project: 12753.001	Eng/Geol: DJC/JMP
Scale:1 " = 4 miles	Date: June 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, Bryant, W. A. (compiler), 2005, Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: CGS
Author: Leighton Geomatics (btran)

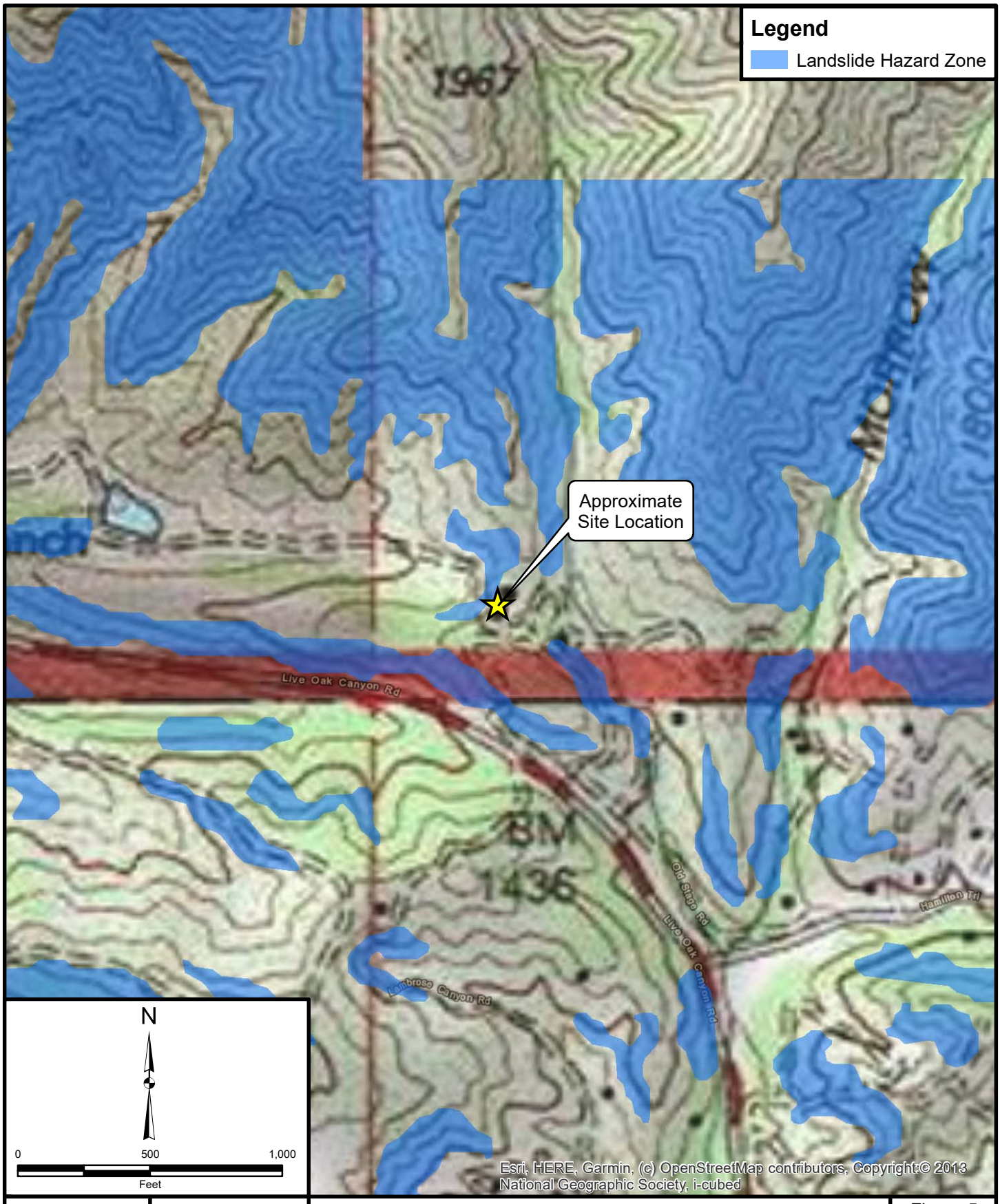
REGIONAL FAULT MAP

Harris Grade Reservoir Replacement
18975 Live Oak Canyon Road
Trabuco Canyon, California

Figure 4

Leighton

Map Saved as V:\Drafting\12753\001\Maps\2753-001_F04-RFM_2020-06-10.mxd on 6/9/2020 4:42:01 PM



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Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, CGS
Author: Leighton Geomatics (btran)

SEISMIC HAZARD MAP

Harris Grade Reservoir Replacement
18975 Live Oak Canyon Road
Trabuco Canyon, California

Figure 5

Leighton

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APPENDIX A

BORING LOGS

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	12753.001	**Date Drilled**	5-7-20
Project	Harris Grade Reservoir Replacement	**Logged By**	JMP
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 2- Boring Location Map	**Sampled By**	JMP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B1				ML/CL	**Artificial Fill (Af):** @0': Sandy SILT to Lean CLAY; orange brown to gray brown; moist; fine to medium sand. **Tertiary Silverado Formation (Tsi):**	CR
				R1	27 50/5"	122	13		@2.5': Clayey SANDSTONE; hard; yellow brown; moist; fine to medium sand; moderately cemented; micaceous.	
	5			R2	50/6"	121	10		@5': Clayey SANDSTONE; hard; yellow brown; moist; fine to medium sand; micaceous; moderately cemented.	
				R3	18 38 50/5"	127	9		@7.5': Clayey SANDSTONE; hard; yellow brown to olive; moist; fine to medium sand; moderately cemented.	
	10			S1	17 30 42				@10': Clayey SANDSTONE; hard; yellow brown to olive; moist; fine to medium sand; moderately cemented.	
	15			R4	50/4"				@15': SANDSTONE; hard; light yellow brown; slightly moist; fine to medium sand; moderately cemented.	
	20			S2	12 18 40				@20': SILTSTONE; hard; olive brown to blue gray; slightly moist.	
	25			R5	50/6"				@25': SANDSTONE; hard; light yellow brown to orange brown; slightly moist; fine to coarse sand; oxidized; moderately cemented.	
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-1

Project No.	12753.001	**Date Drilled**	5-7-20
Project	Harris Grade Reservoir Replacement	**Logged By**	JMP
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 2- Boring Location Map	**Sampled By**	JMP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S3	24 28 38				@30': SANDSTONE; hard; reddish brown; slightly moist; fine to medium sand.	
	35			S4	20 50/3"				@35': SANDSTONE; hard; reddish brown; slightly moist; fine to medium sand.	
	40			S5	50/6"				@40': SANDSTONE; hard; blue gray; slightly moist; fine to medium sand; unoxidized. @41': Refusal, very difficult drilling.	
	45								**Total Depth: 41 feet** **No groundwater encountered.** **Backfilled with cuttings.**	
	50									
	55									
	60									

The Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

GEOTECHNICAL BORING LOG LB-2

Project No.	12753.001	**Date Drilled**	5-7-20
Project	Harris Grade Reservoir Replacement	**Logged By**	JMP
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 2- Boring Location Map	**Sampled By**	JMP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B1				CL	**Artificial Fill (Af):**	EI, RV, CR
				R1	4 4 5	107	13		@2.5': Sandy CLAY; medium stiff; mottled medium brown and dark brown; very moist; fine to medium sand.	
	5			R2	4 5 6	115	14		@5': Lean CLAY; medium stiff; mottled olive brown and dark brown; very moist; fine to medium sand.	DS
									Colluvium/Alluvium (Qcol//Qal): @6': Lean CLAY; medium stiff; dark brown; very moist; trace sand.	
				R3	3 6 10	115	17		@7.5': Stiff; dark olive brown; very moist; trace sand.	CN
	10			R4	10 18 30	122	12	SC	@10': Clayey SAND; dense; dark brown; moist; fine sand.	
	15			S1	4 5 6				@15': Clayey SAND; medium dense; medium brown; moist; fine to medium sand.	
	20			R5	7 12 12	115	11	SC-SM	@20': Silty Clayey SAND; medium dense; medium brown with pockets of light brown; moist; fine to medium sand.	
	25			S2	8 12 14				**Tertiary Silverado Formation (Tsi):** @25': SILTSTONE; moderately hard; olive yellow brown; moist; moderately weathered.	
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-2

Project No.	12753.001	**Date Drilled**	5-7-20
Project	Harris Grade Reservoir Replacement	**Logged By**	JMP
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	'
Location	See Figure 2- Boring Location Map	**Sampled By**	JMP

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			R6	50/6"				@30': SANDSTONE; hard; light yellow brown with orange oxidation; slightly moist; fine to medium sand; moderately cemented.	
				S3	24 50/6"				@32': SANDSTONE; hard; light yellow to light olive; slightly moist; fine to medium sand; moderately cemented. Very difficult drilling. Auger refusal. Stopped drilling and drove SPT sampler.	
	35								**Total Depth: 33 feet** **No groundwater encountered.** **Backfilled with cuttings.**	
	40									
	45									
	50									
	55									
	60									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

APPENDIX B

LABORATORY TEST RESULTS

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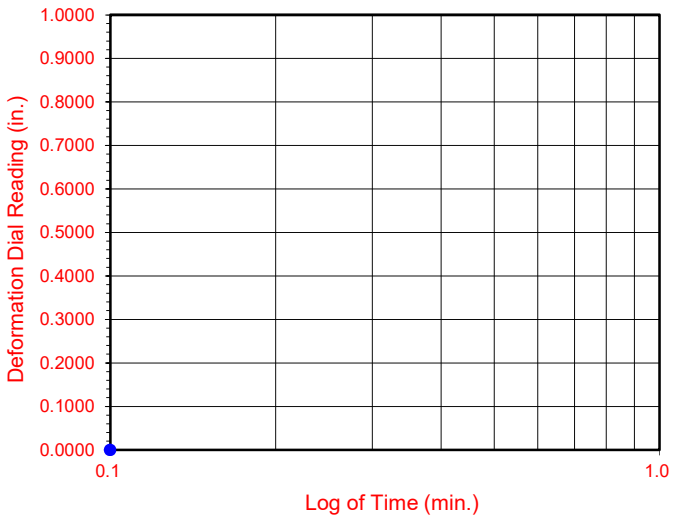
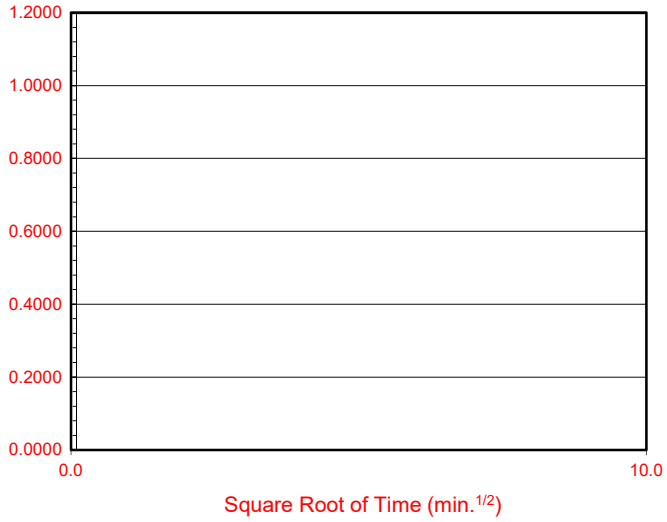
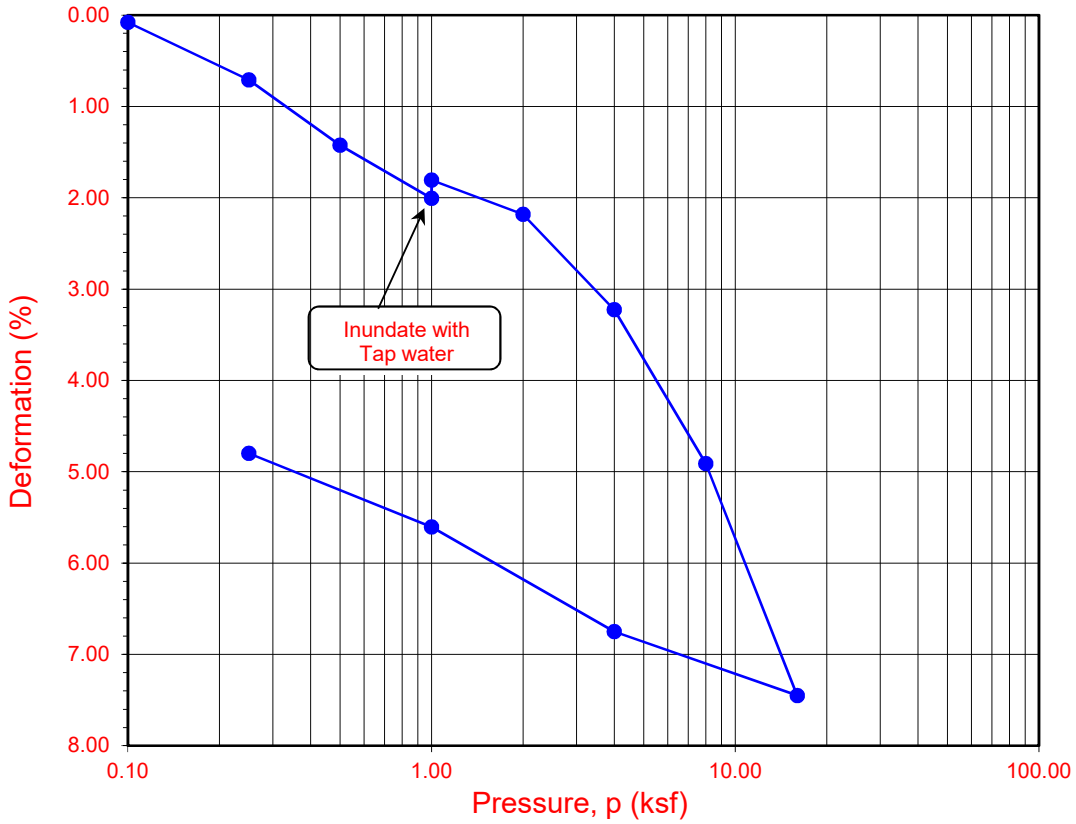
Time Readings







Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-2	**R3**	**7.5**	**16.9**	**15.5**	**115.0**	**120.8**	**0.465**	**0.395**	**98**	**106**

Soil Identification: Dark olive brown lean clay (CL)

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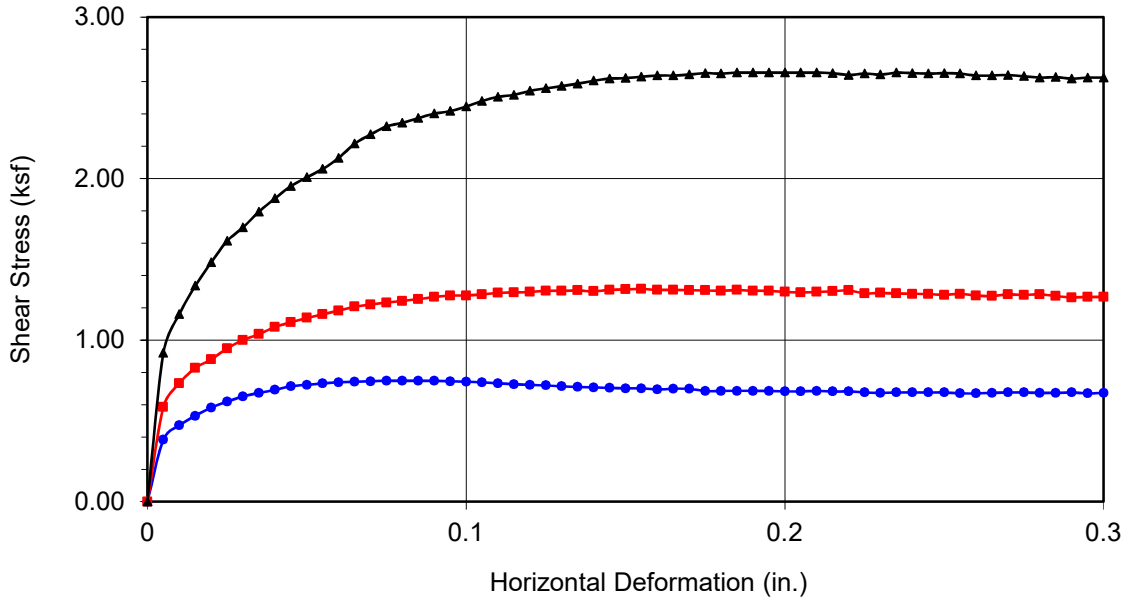
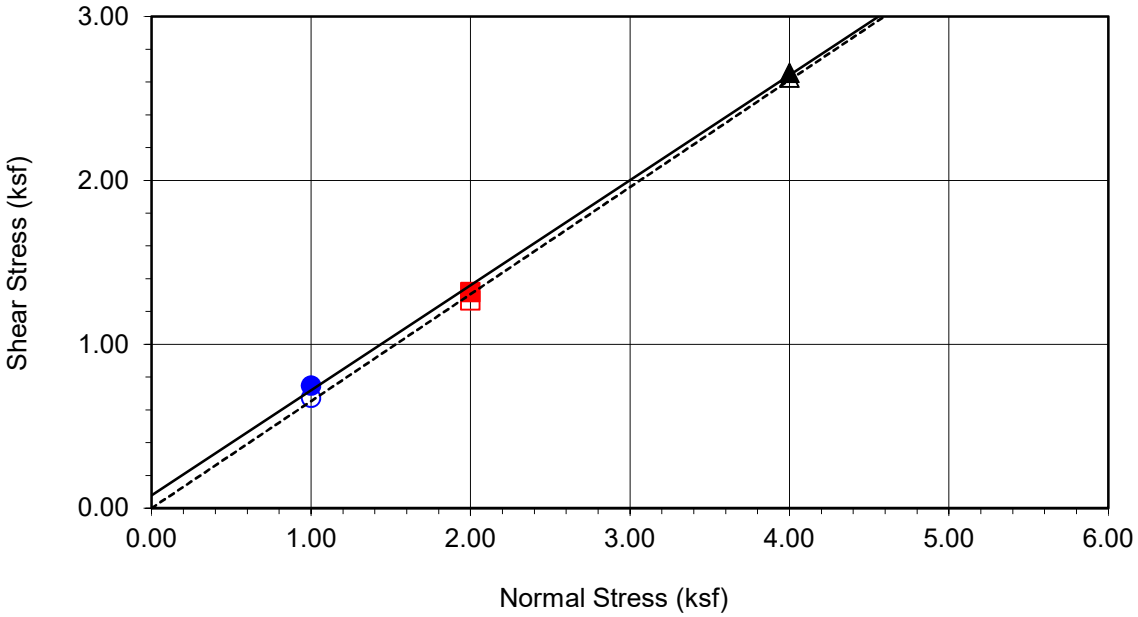
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 12753.001

Harris Grade Reservoir Replacement

05-20





Boring No.	**LB-2**
Sample No.	**R2**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification:	Olive brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	78	33
Ultimate	0	33

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 0.748	■ 1.317	▲ 2.656
Shear Stress @ End of Test (ksf)	○ 0.673	□ 1.267	△ 2.625
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	13.92	13.92	13.92
Dry Density (pcf)	113.9	114.3	116.4
Saturation (%)	78.4	79.2	83.9
Soil Height Before Shearing (in.)	0.9870	0.9735	0.9510
Final Moisture Content (%)	16.0	15.3	14.2

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 12753.001

Harris Grade Reservoir Replacement

05-20

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Harris Grade Reservoir Replacement	Tested By:	S. Felter	Date:	05/12/20
Project No.:	12753.001	Checked By:	A. Santos	Date:	05/26/20
Boring No.:	LB-2	Depth (ft.):	0-5		
Sample No.:	B1				
Soil Identification:	Dark brown lean clay with sand (CL)s				

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0310
Wt. Comp. Soil + Mold (g)	600.20	432.70
Wt. of Mold (g)	201.80	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	787.90	634.50
Dry Wt. of Soil + Cont. (g)	713.10	562.35
Wt. of Container (g)	0.00	201.80
Moisture Content (%)	10.49	20.01
Wet Density (pcf)	120.2	126.6
Dry Density (pcf)	108.8	105.5
Void Ratio	0.550	0.598
Total Porosity	0.355	0.374
Pore Volume (cc)	73.4	79.9
Degree of Saturation (%) [S_{meas}]	**51.5**	90.3

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
05/12/20	9:50	1.0	0	0.6240
05/12/20	10:00	1.0	10	0.6230
Add Distilled Water to the Specimen				
05/12/20	10:15	1.0	15	0.6380
05/13/20	6:50	1.0	1250	0.6550
05/13/20	8:00	1.0	1320	0.6550

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**32**

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SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Harris Grade Reservoir Replacement		Tested By :	A. Lopez	Date: 05/14/20
Project No. :	12753.001		Checked By:	A. Santos	Date: 05/26/20
Boring No.:	LB-1		Depth (ft.) :	0-5	
Sample No. :	B1				

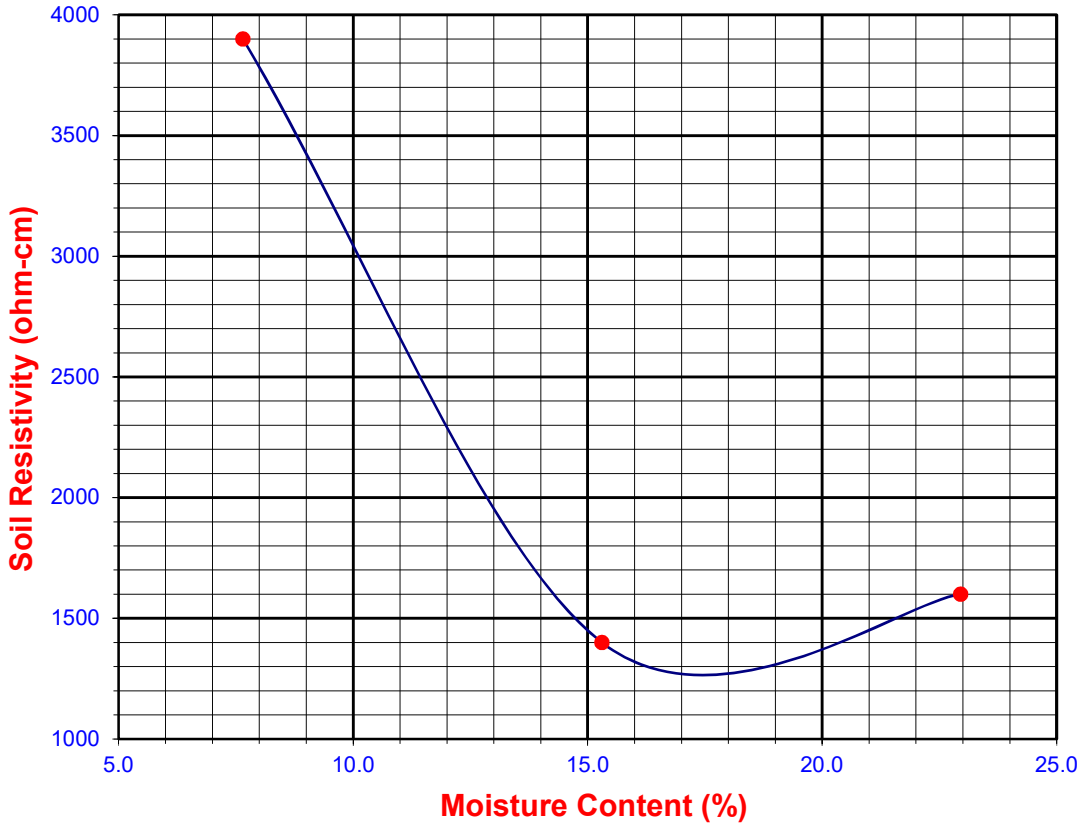
Soil Identification:* Yellowish brown (CL-ML)s

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	7.65	3900	3900
2	20	15.30	1400	1400
3	30	22.95	1600	1600
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.70
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1260	**17.5**	**49**	**40**	**7.98**	**20.6**



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SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Harris Grade Reservoir Replacement		Tested By :	A. Lopez	Date: 05/14/20
Project No. :	12753.001		Checked By:	A. Santos	Date: 05/26/20
Boring No.:	LB-2		Depth (ft.) :	0-5	
Sample No. :	B1				

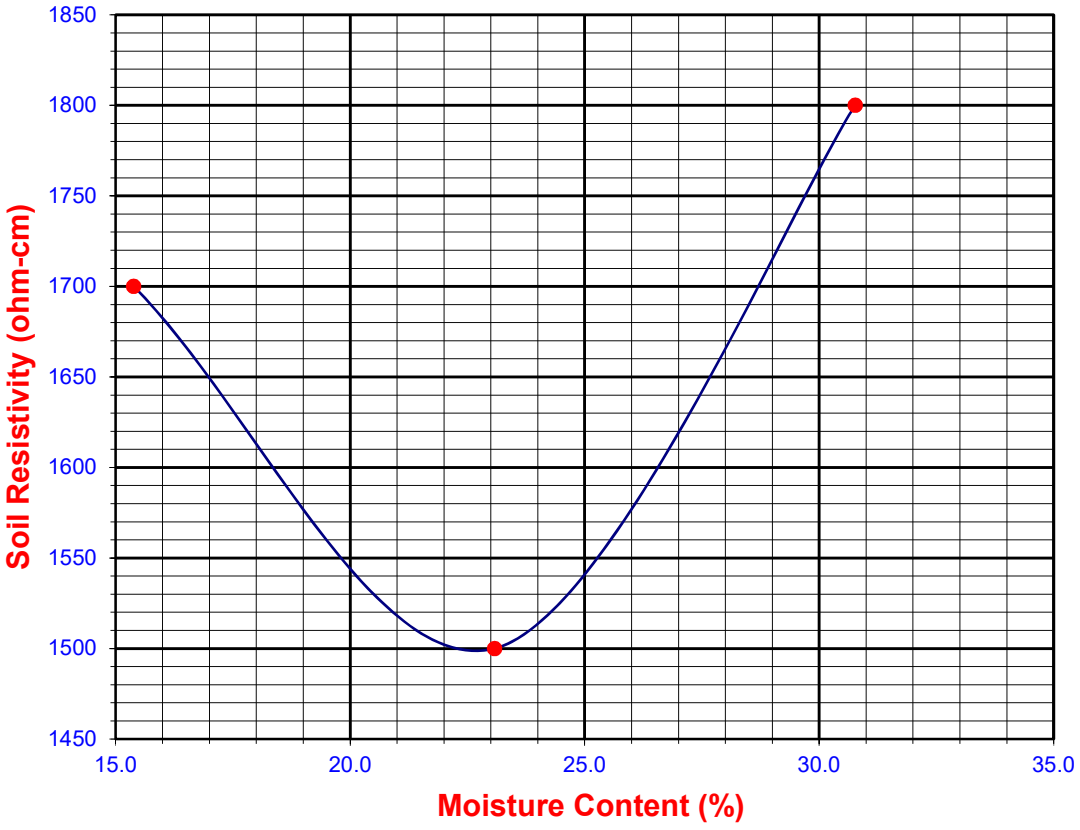
Soil Identification:* Dark brown (CL)s

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.38	1700	1700
2	30	23.08	1500	1500
3	40	30.77	1800	1800
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1498	**22.7**	**53**	**110**	**7.24**	**21.0**



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R-VALUE TEST RESULTS

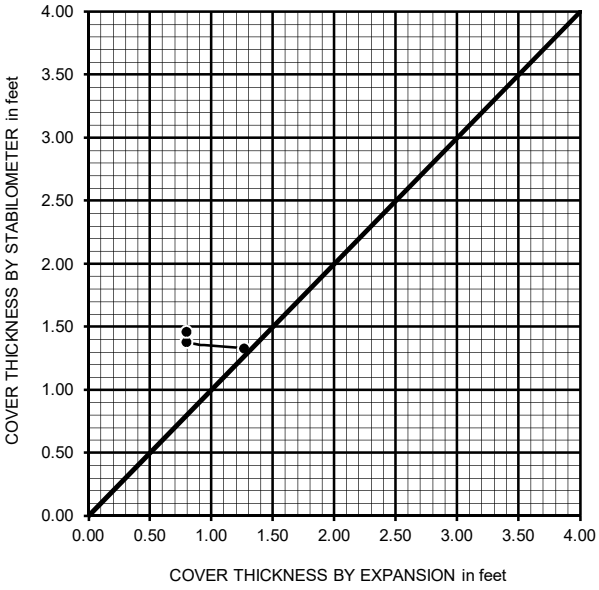
DOT CA Test 301

PROJECT NAME:	Harris Grade Reservoir Replacement	PROJECT NUMBER:	12753.001
LOCATION:	LB-2	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	O.Figueroa
SAMPLE DESCRIPTION:	Dark brown lean clay with sand (CL)s	DATE COMPLETED:	5/15/2020

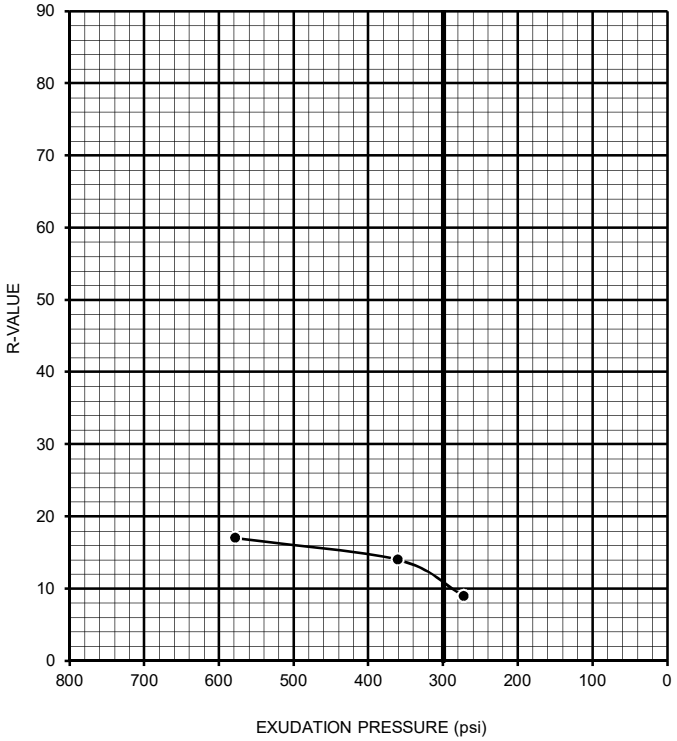
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	14.5	14.7	15.6
HEIGHT OF SAMPLE, Inches	2.42	2.59	2.57
DRY DENSITY, pcf	117.7	115.3	113.7
COMPACTOR PRESSURE, psi	75	50	50
EXUDATION PRESSURE, psi	579	361	273
EXPANSION, Inches x 10exp-4	38	24	24
STABILITY Ph 2,000 lbs (160 psi)	120	130	137
TURNS DISPLACEMENT	3.76	3.95	4.18
R-VALUE UNCORRECTED	18	13	9
R-VALUE CORRECTED	17	14	9

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	1.33	1.38	1.46
EXPANSION PRESSURE THICKNESS, ft.	1.27	0.80	0.80

EXPANSION PRESSURE CHART

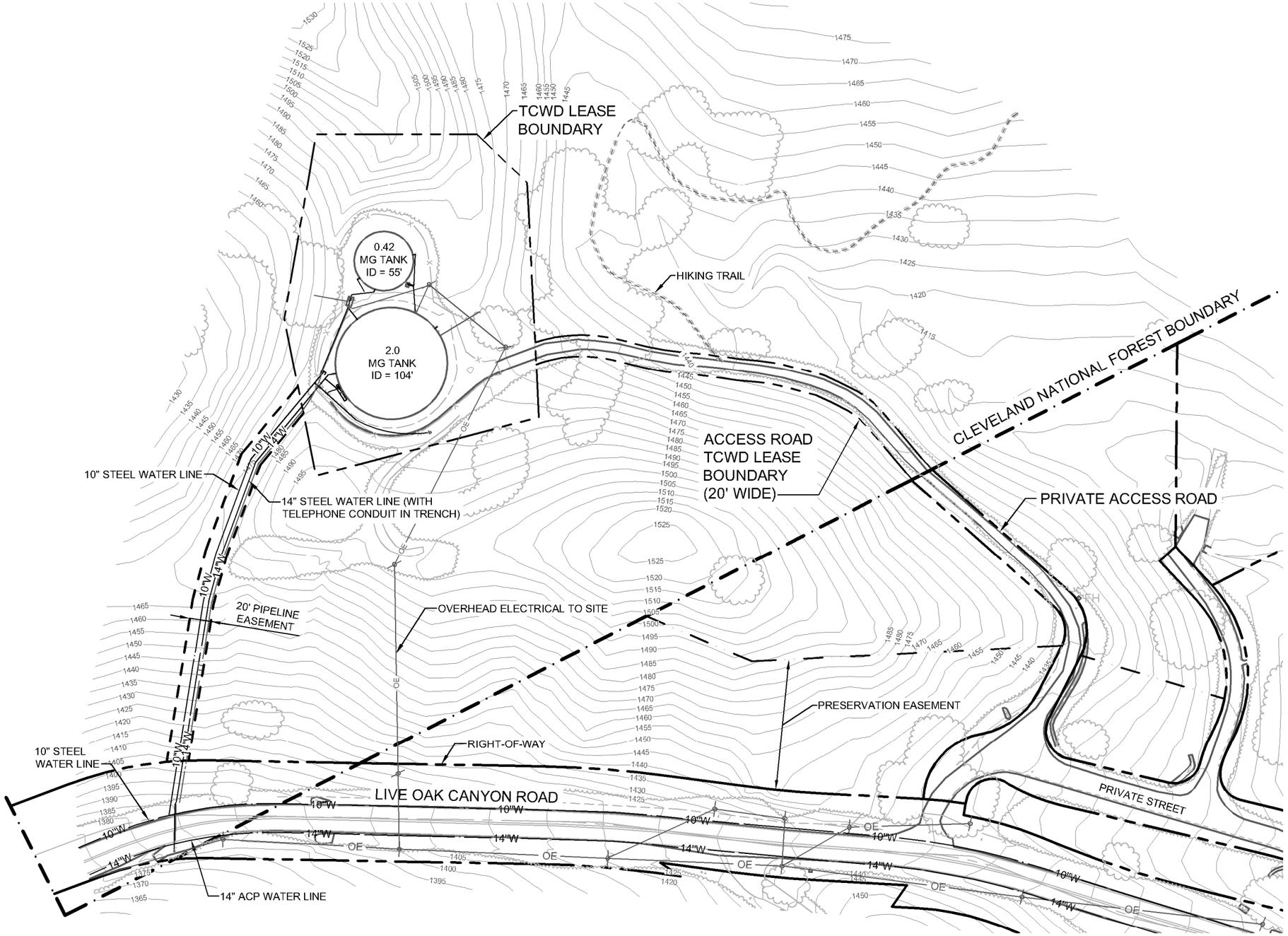


EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	16
R-VALUE BY EXUDATION:	11
EQUILIBRIUM R-VALUE:	11

Appendix B. Figures



8/26/2020 2:08:35 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-702A- (FIG 1-1) EXISTING-SITE.DWG - LERMA, JACKIE

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TRABUCO CANYON WATER DISTRICT

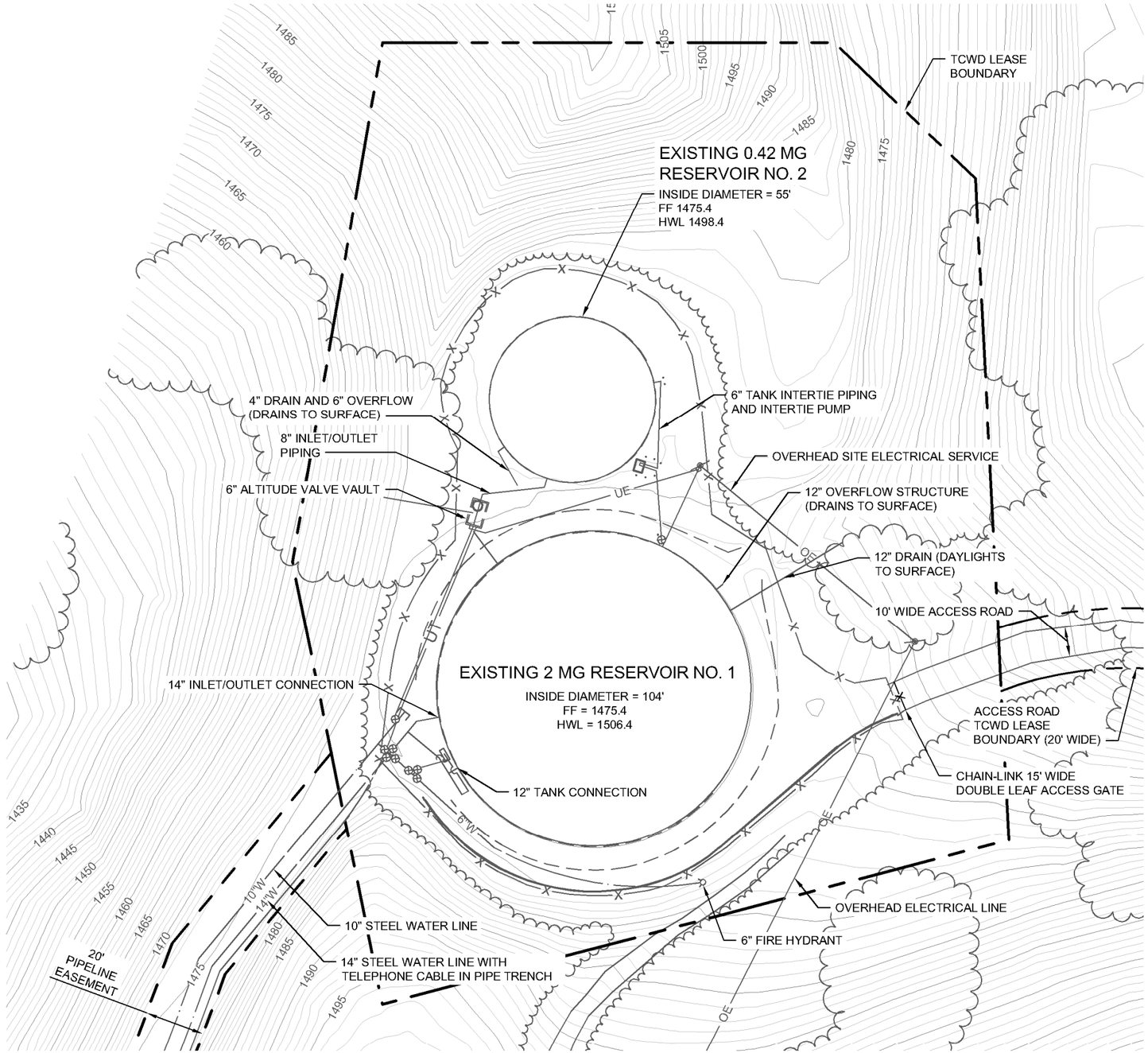
HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

HARRIS GRADE EXISTING SITE, PIPING, AND ACCESS TO LIVE OAK CANYON RD.

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
1-1

Bar Measures 1 inch



8/26/2020 2:09:43 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-702B- (FIG 1-2) EXISTING-SITE-ZOOMED-IN.DWG - LERMA, JACKIE

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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

HARRIS GRADE EXISTING SITE PLAN

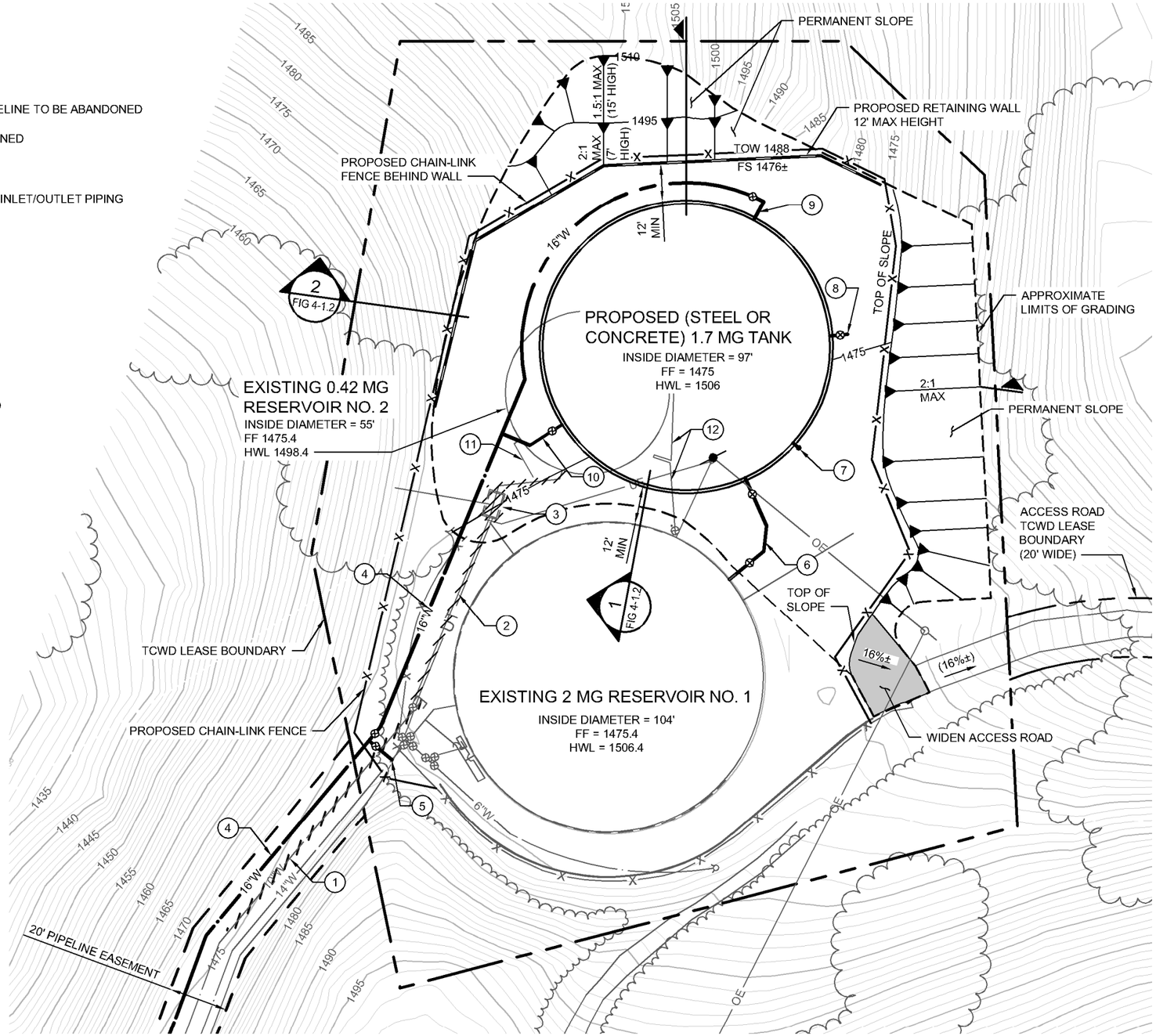
Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
1-2

Bar Measures 1 inch

PIPING NOTES:

1. EXISTING 10"W TO BE ABANDONED
2. EXISTING 8" RESERVOIR NO. 2 INLET/OUTLET PIPELINE TO BE ABANDONED
3. EXISTING ALTITUDE VALVE VAULT TO BE ABANDONED
4. PROPOSED 16" INLET/OUTLET PIPING
5. PROPOSED POINT OF CONNECTION TO EXIST 14" INLET/OUTLET PIPING
6. PROPOSED 16" TANK INTERTIE
7. PROPOSED TANK OVERFLOW
8. PROPOSED TANK DRAIN
9. PROPOSED 16" TANK INLET CONNECTION
10. PROPOSED 16" TANK OUTLET CONNECTION
11. EXISTING RESERVOIR DRAIN TO BE REMOVED
12. EXISTING TANK INTERTIE PIPING TO BE REMOVED



LEGEND:

- PROPOSED VALVE
- EXISTING VALVE
- 16"W — PROPOSED WATERLINE
- X"W — EXISTING WATERLINE
- PROPOSED RETAINING WALL
- EXISTING POWER POLE (RELOCATION REQUIRED)
- EXISTING POWER POLE PROTECT IN PLACE

NOTES:

1. ALL NEW TANK PIPING CONNECTIONS SHALL HAVE FLEXIBLE EXPANSION JOINT COUPLINGS.
2. CONCRETE TANK ALTERNATIVE SHALL HAVE BELOW GRADE FLOOR PENETRATIONS ON THE INLET, OUTLET, TANK INTERTIE, AND DRAIN PIPING CONNECTIONS.
3. STEEL TANK ALTERNATIVE WILL HAVE ABOVE GRADE WALL PENETRATIONS AT ALL PIPING CONNECTIONS.

0 20' 40'
SCALE: 1" = 40'

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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

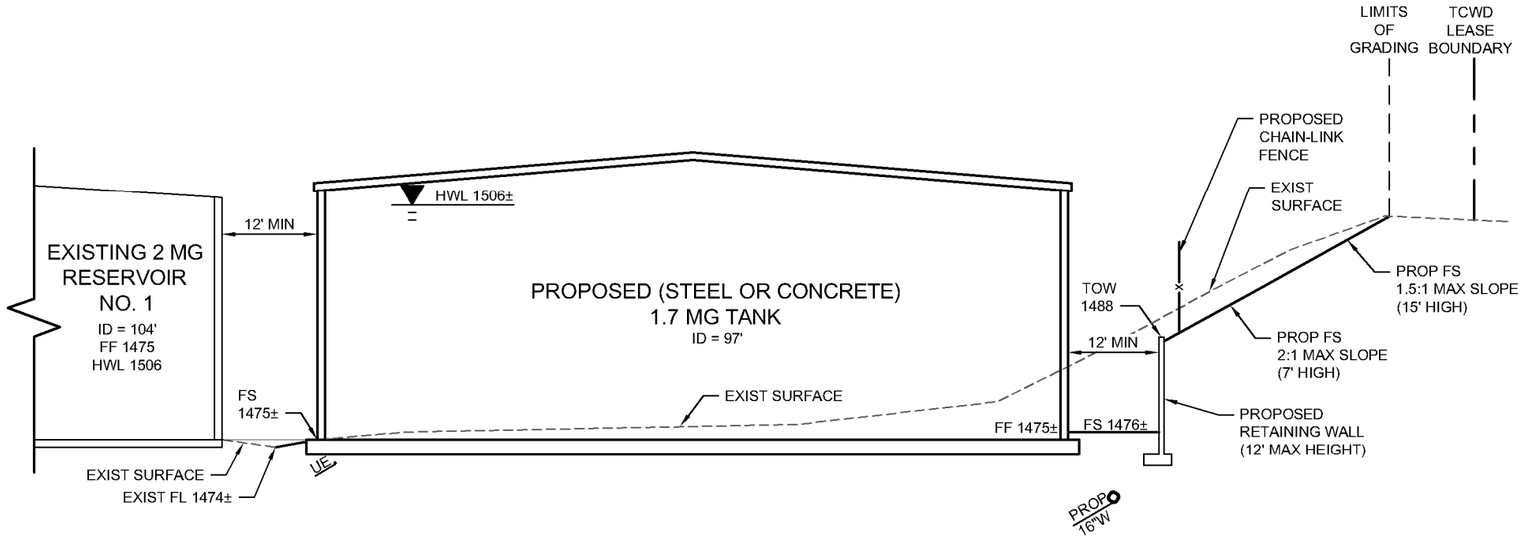
ALTERNATE 1
1.7 MG TANK CONCEPTUAL FINAL GRADING, YARD PIPING, AND SITE PLAN

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

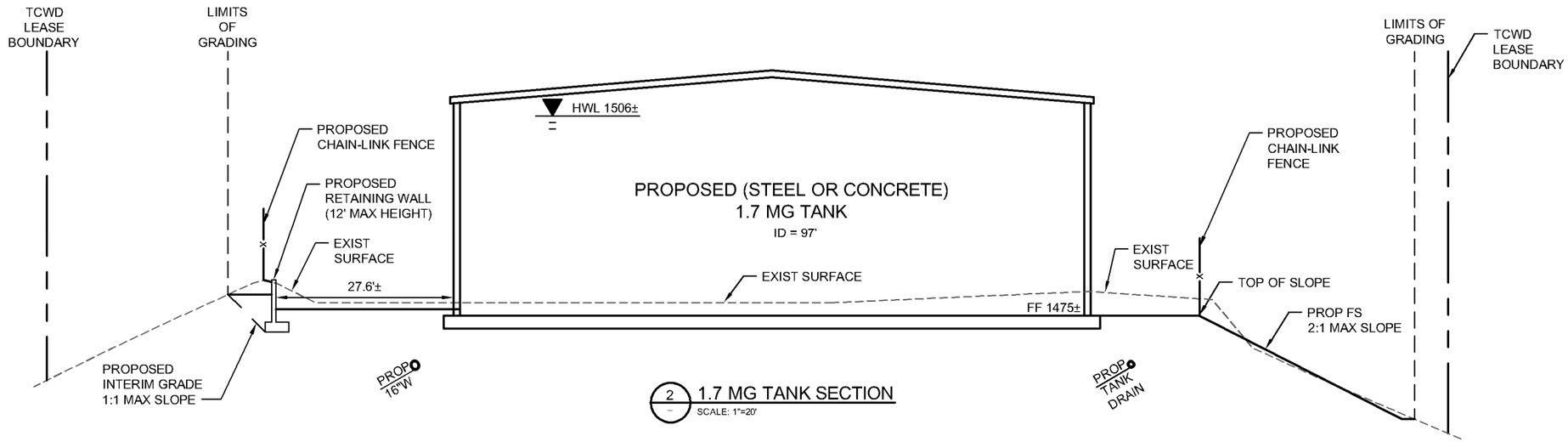
FIGURE
4-1.1

Bar Measures 1 inch

8/26/2020 2:10:55 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-704A- (FIG 4-1.1) 1.7 MG TANK-PERMANENT-SLOPE-AND-RETAINING-WALL.DWG - LERMA, JACKIE



1 — 1.7 MG TANK SECTION
SCALE: 1"=20'



2 — 1.7 MG TANK SECTION
SCALE: 1"=20'

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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

ALTERNATIVE 1
1.7 MG TANK CONCEPTUAL GRADING SECTIONS

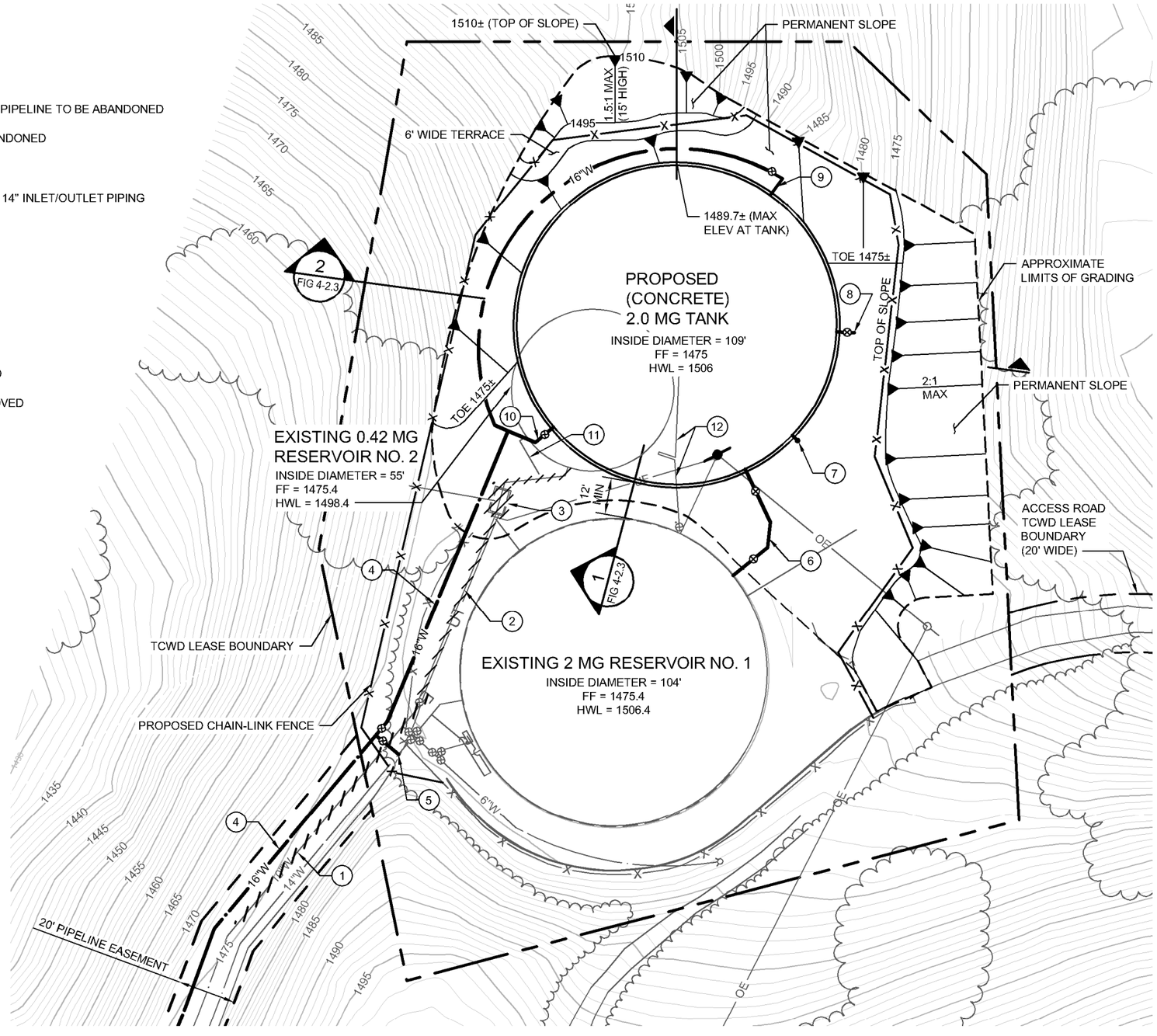
Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
4-1.2

Bar Measures 1 inch

PIPING NOTES:

1. EXISTING 10"W TO BE ABANDONED
2. EXISTING 8" RESERVOIR NO. 2 INLET/OUTLET PIPELINE TO BE ABANDONED
3. EXISTING ALTITUDE VALVE VAULT TO BE ABANDONED
4. PROPOSED 16" INLET/OUTLET PIPING
5. PROPOSED POINT OF CONNECTION TO EXIST 14" INLET/OUTLET PIPING
6. PROPOSED 16" TANK INTERTIE
7. PROPOSED TANK OVERFLOW
8. PROPOSED TANK DRAIN
9. PROPOSED 16" TANK INLET CONNECTION
10. PROPOSED 16" TANK OUTLET CONNECTION
11. EXISTING RESERVOIR DRAIN TO BE REMOVED
12. EXISTING TANK INTERTIE PIPING TO BE REMOVED



LEGEND:

- PROPOSED VALVE
- EXISTING VALVE
- 16"W — PROPOSED WATERLINE
- X"W — EXISTING WATERLINE
- EXISTING POWER POLE (RELOCATION REQUIRED)
- EXISTING POWER POLE PROTECT IN PLACE

NOTES:

1. ALL NEW TANK PIPING CONNECTIONS SHALL HAVE FLEXIBLE EXPANSION JOINT COUPLINGS.

0 20' 40'
SCALE: 1" = 40'

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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

ALTERNATIVE 2
2.0 MG TANK CONCEPTUAL FINAL GRADING, YARD PIPING, AND SITE PLAN

Project No.: 200-09339-20001
Date: AUGUST 2020
Designed By: KMB

FIGURE
4-2.1

Bar Measures 1 inch

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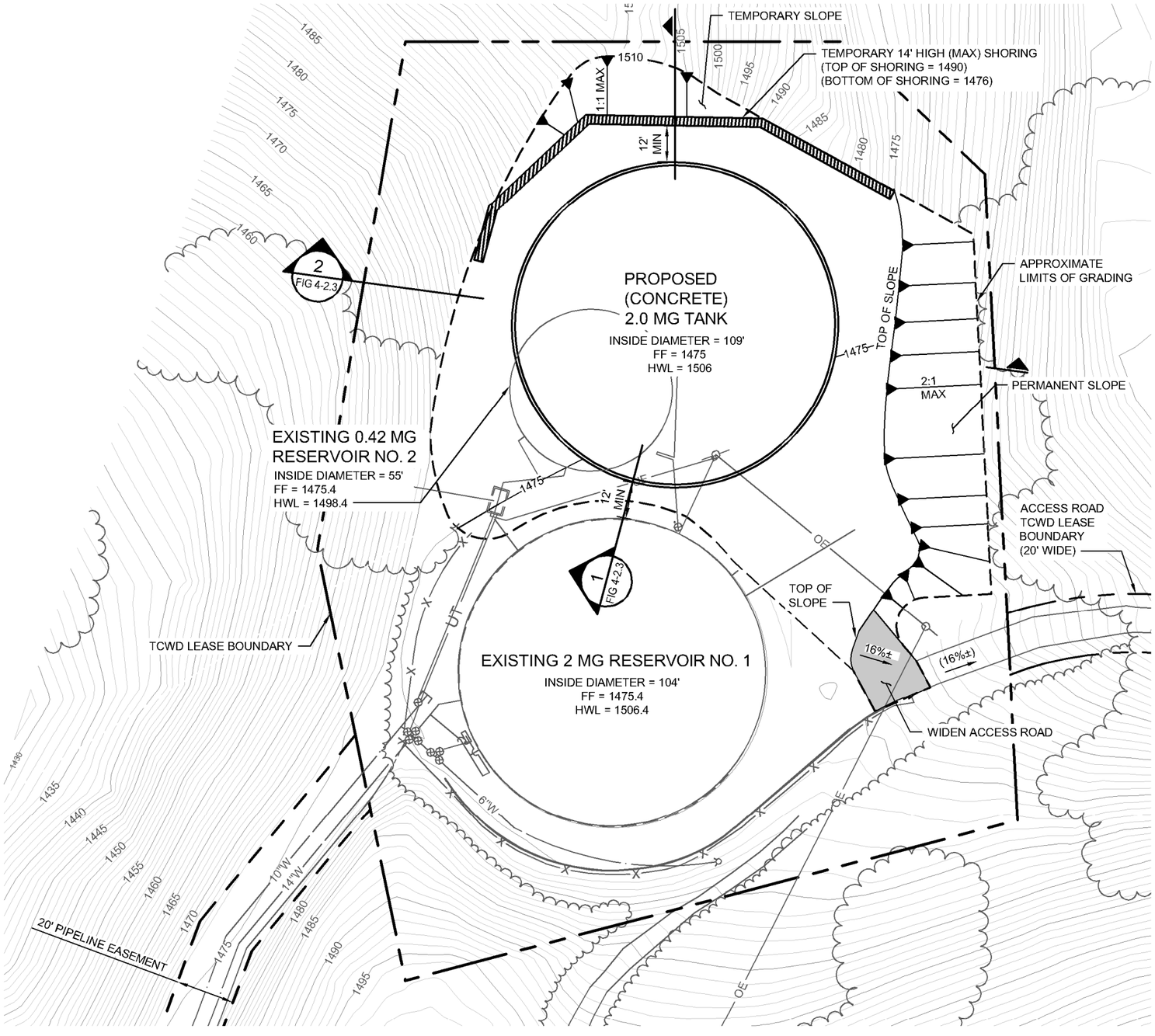

8/26/2020 2:17:09 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-704C- (FIG 4-2.2) 2.0 MG TANK (INTERIM).DWG - LERMA, JACKIE

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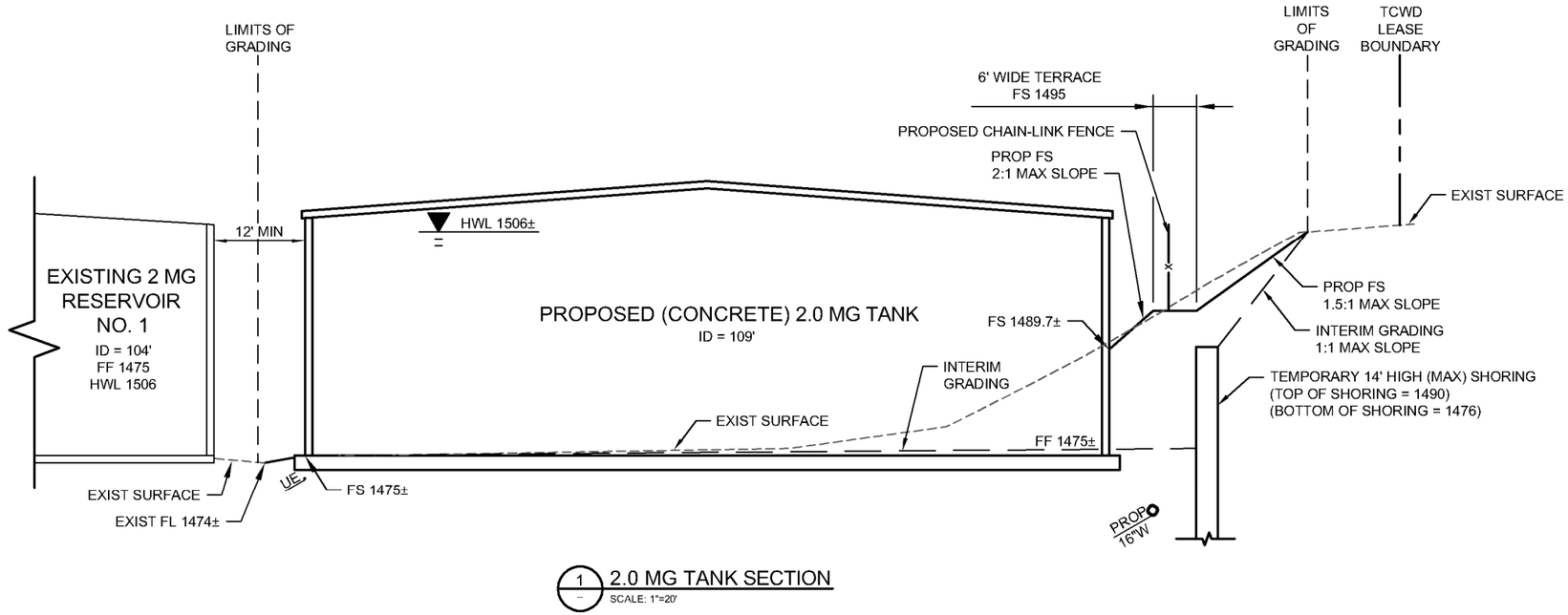
HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

ALTERNATIVE 2
2.0 MG TANK CONCEPTUAL INTERIM GRADING

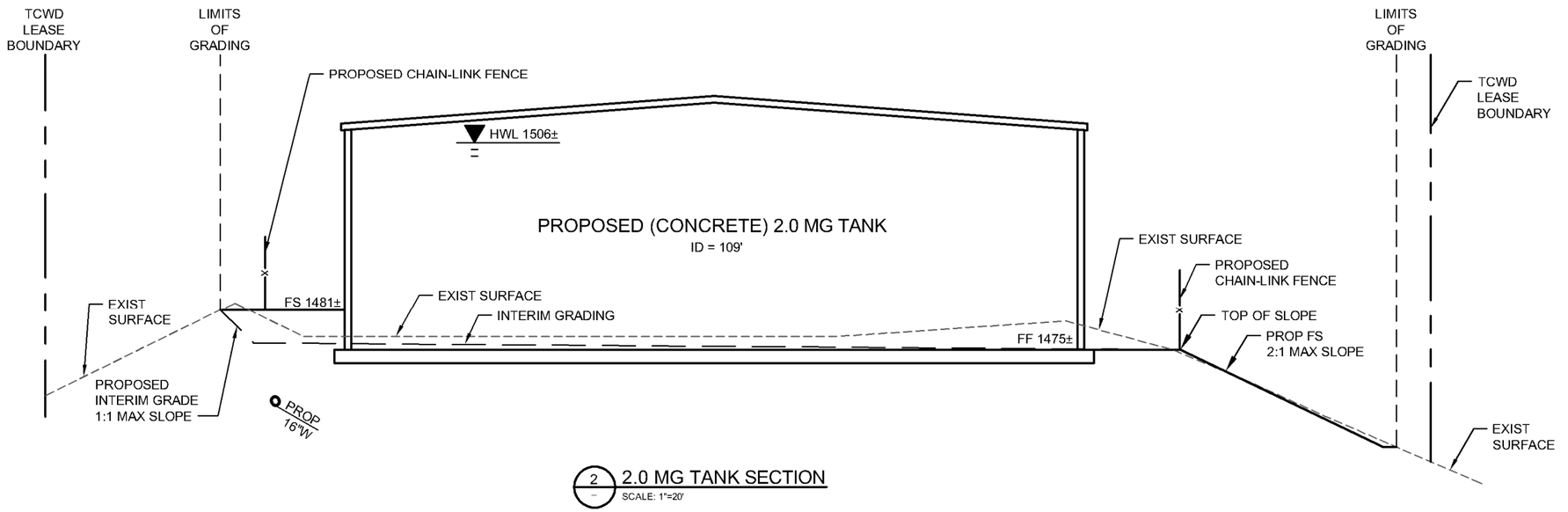
Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
4-2.2

Bar Measures 1 inch



1 — 2.0 MG TANK SECTION
SCALE: 1"=20'



2 — 2.0 MG TANK SECTION
SCALE: 1"=20'

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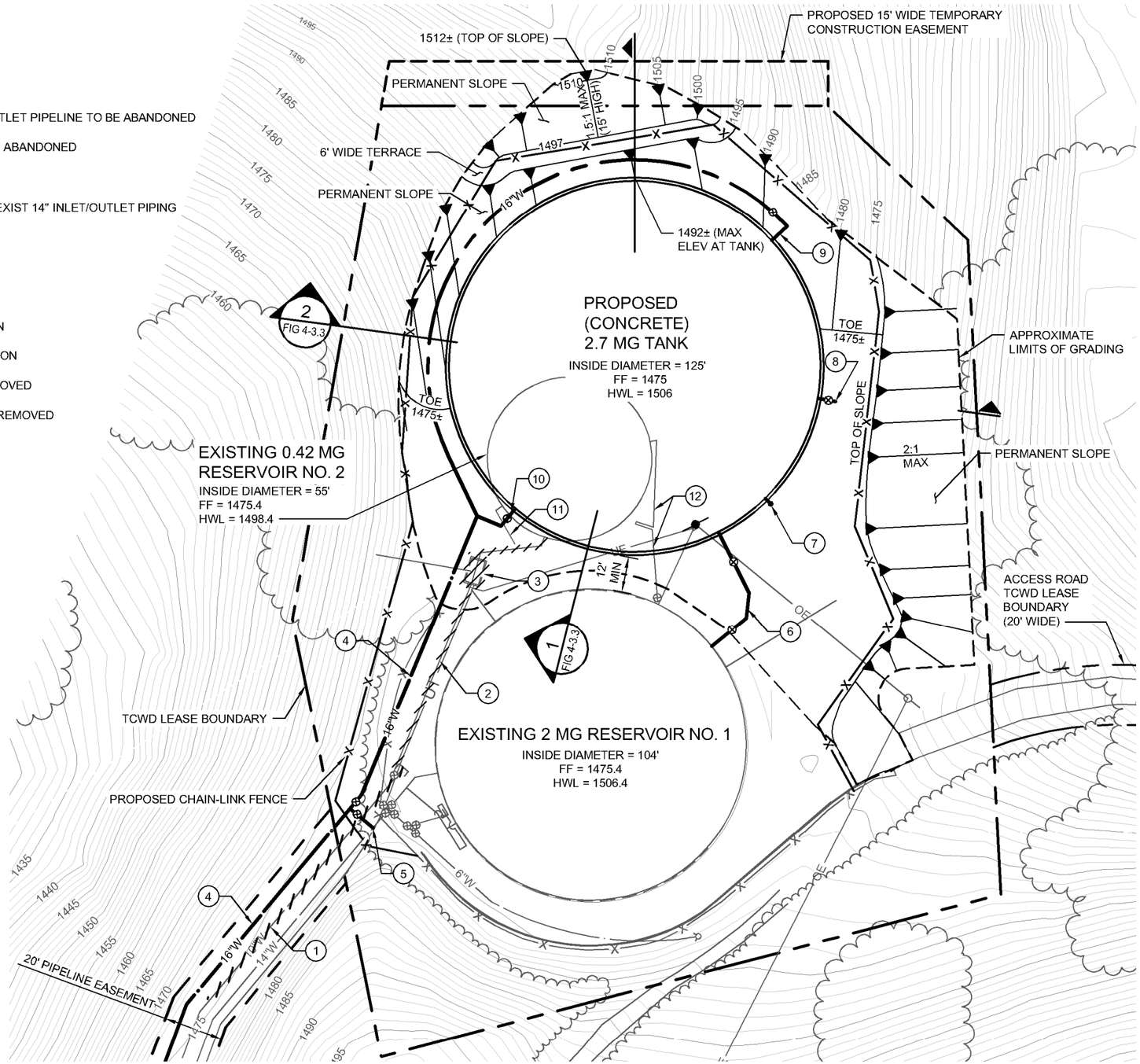
Bar Measures 1 inch

PIPING NOTES:

1. EXISTING 10"W TO BE ABANDONED
2. EXISTING 8" RESERVOIR NO. 2 INLET/OUTLET PIPELINE TO BE ABANDONED
3. EXISTING ALTITUDE VALVE VAULT TO BE ABANDONED
4. PROPOSED 16" INLET/OUTLET PIPING
5. PROPOSED POINT OF CONNECTION TO EXIST 14" INLET/OUTLET PIPING
6. PROPOSED 16" TANK INTERTIE
7. PROPOSED TANK OVERFLOW
8. PROPOSED TANK DRAIN
9. PROPOSED 16" TANK INLET CONNECTION
10. PROPOSED 16" TANK OUTLET CONNECTION
11. EXISTING RESERVOIR DRAIN TO BE REMOVED
12. EXISTING TANK INTERTIE PIPING TO BE REMOVED



LEGEND:

- PROPOSED VALVE
- EXISTING VALVE
- 16"W — PROPOSED WATERLINE
- X"W — EXISTING WATERLINE
- EXISTING POWER POLE (RELOCATION REQUIRED)
- EXISTING POWER POLE PROTECT IN PLACE

NOTES:

1. ALL NEW TANK PIPING CONNECTIONS SHALL HAVE FLEXIBLE EXPANSION JOINT COUPLINGS.

0 20' 40'
SCALE: 1" = 40'

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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

ALTERNATIVE 3
2.7 MG TANK CONCEPTUAL FINAL GRADING, YARD PIPING, AND SITE PLAN

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
4-3.1

Bar Measures 1 inch

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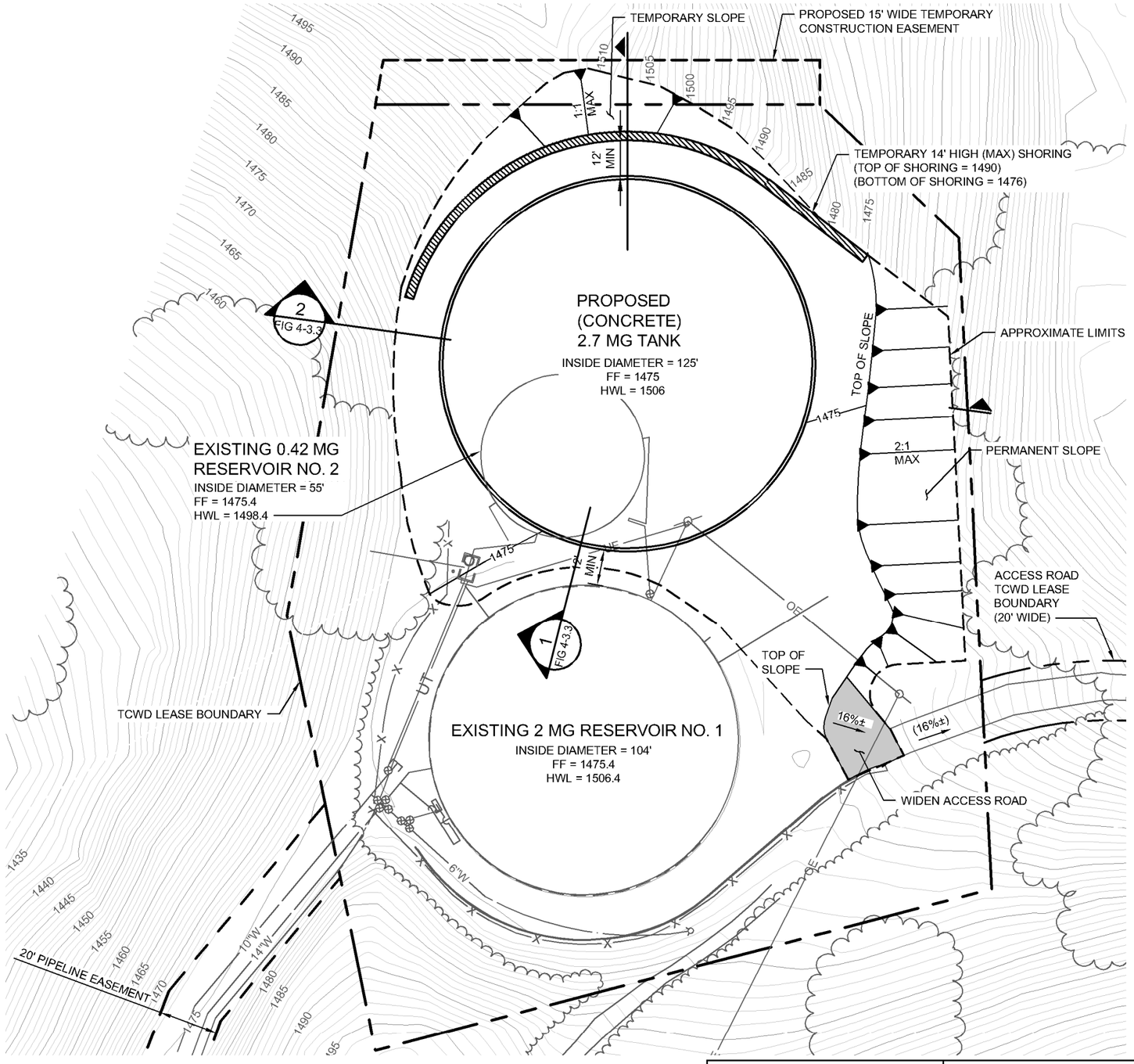

8/26/2020 2:25:31 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-704H- (FIG 4-3.2) 2.7 MG TANK (INTERIM).DWG - LERMA, JACKIE

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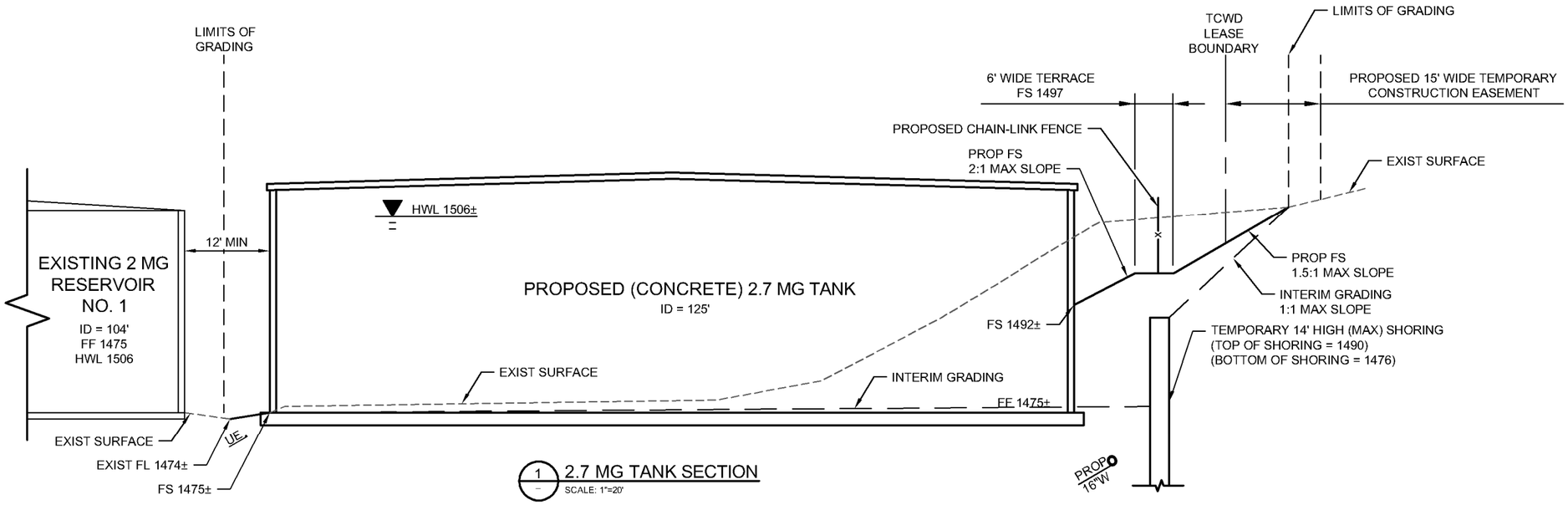
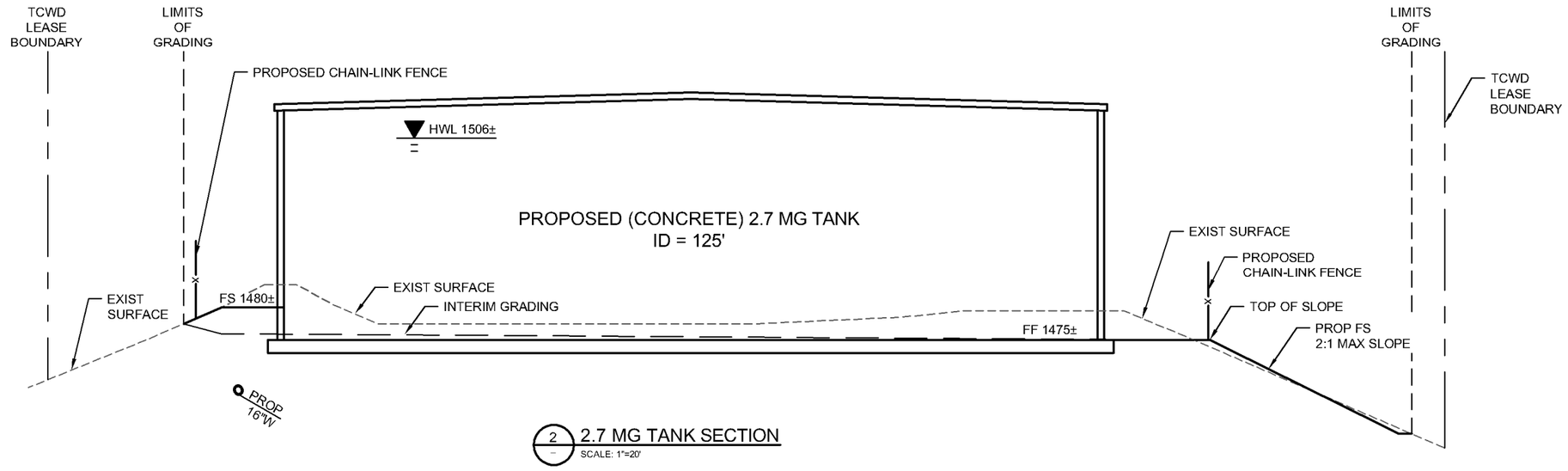
ALTERNATIVE 3
2.7 MG TANK CONCEPTUAL INTERIM GRADING

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
4-3.2

Bar Measures 1 inch





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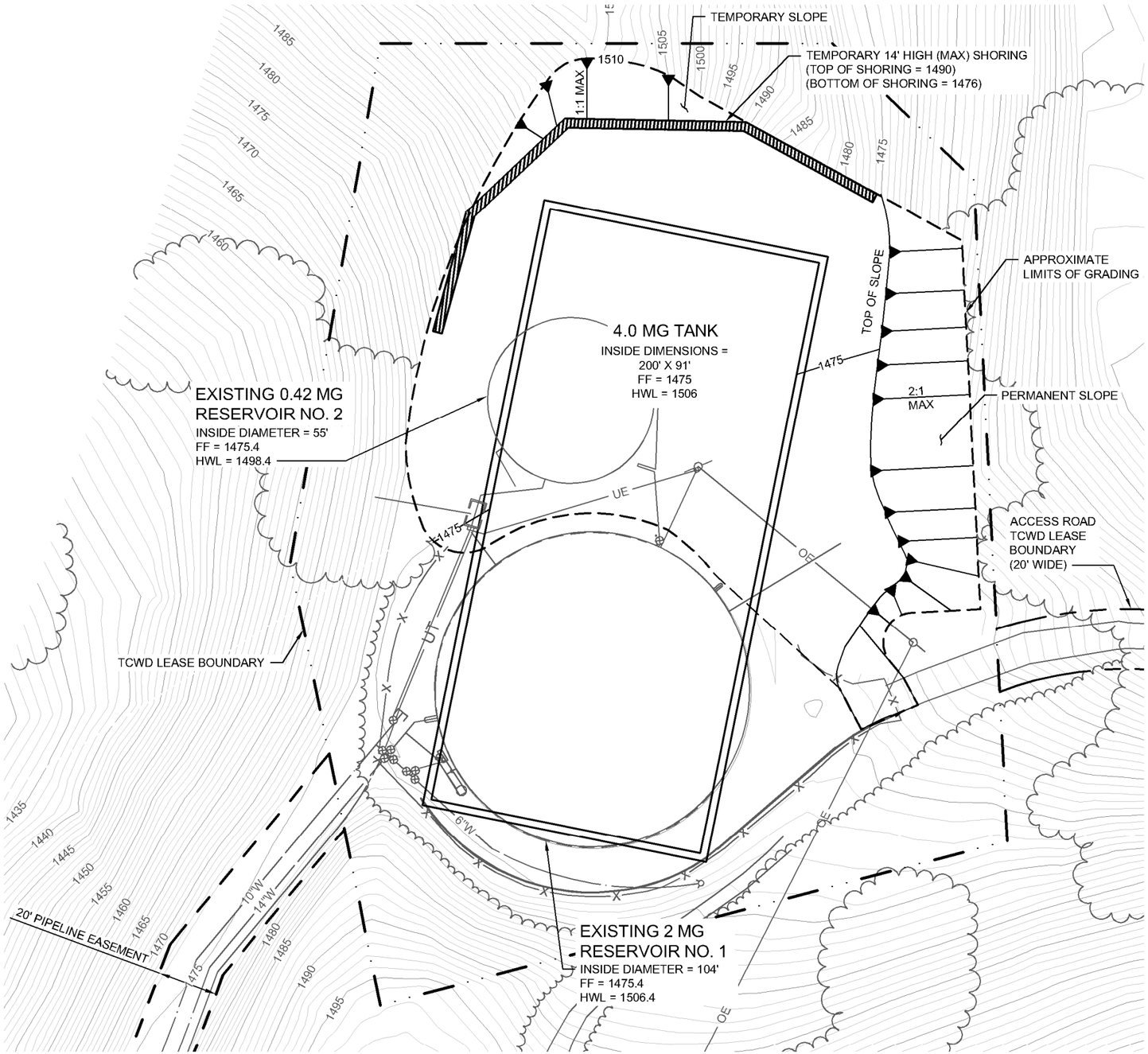
Bar Measures 1 inch



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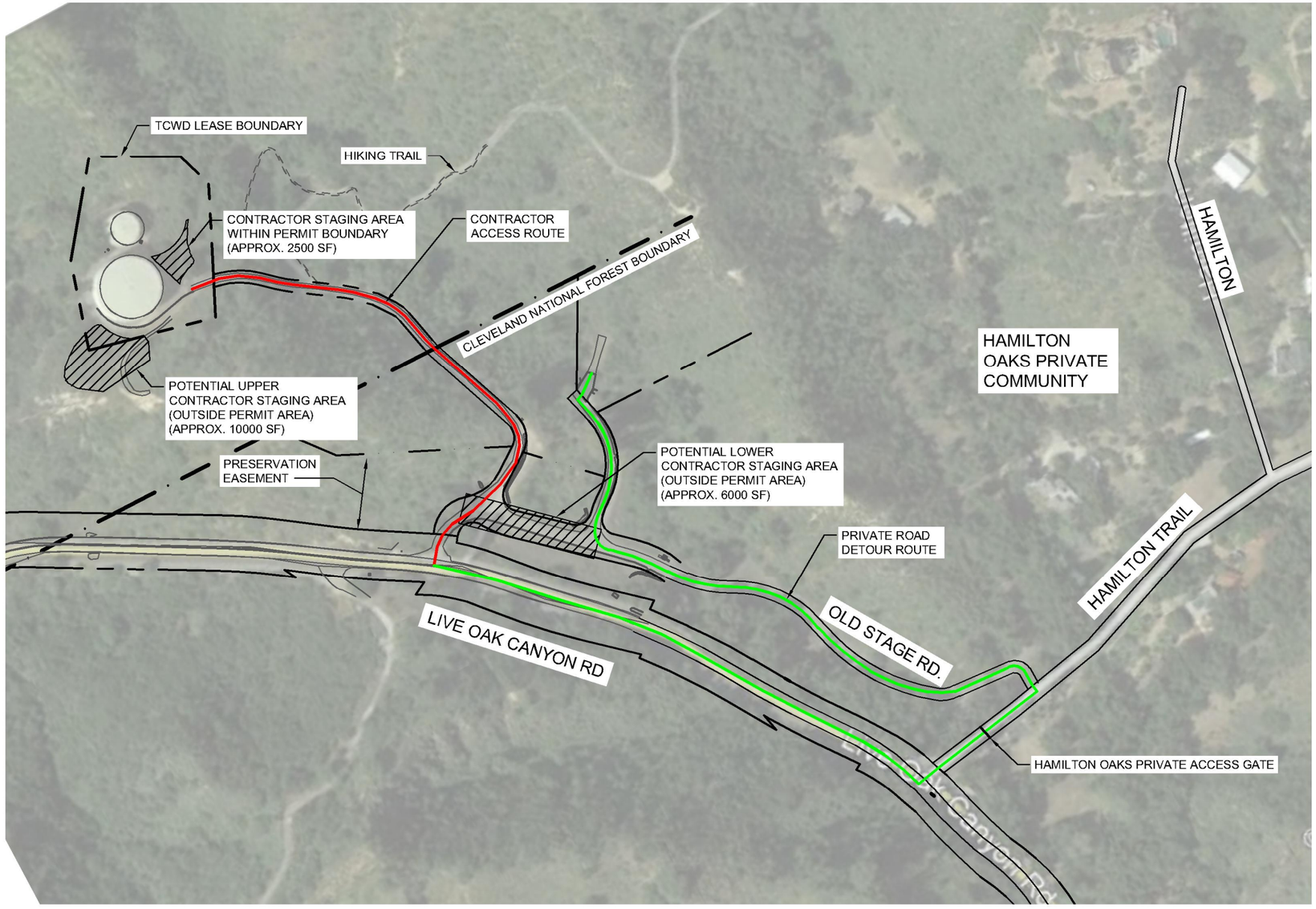
Bar Measures 1 inch



LEGEND:

CONTRACTOR ACCESS

POTENTIAL DETOUR

0 100' 200'

SCALE: 1" = 200'

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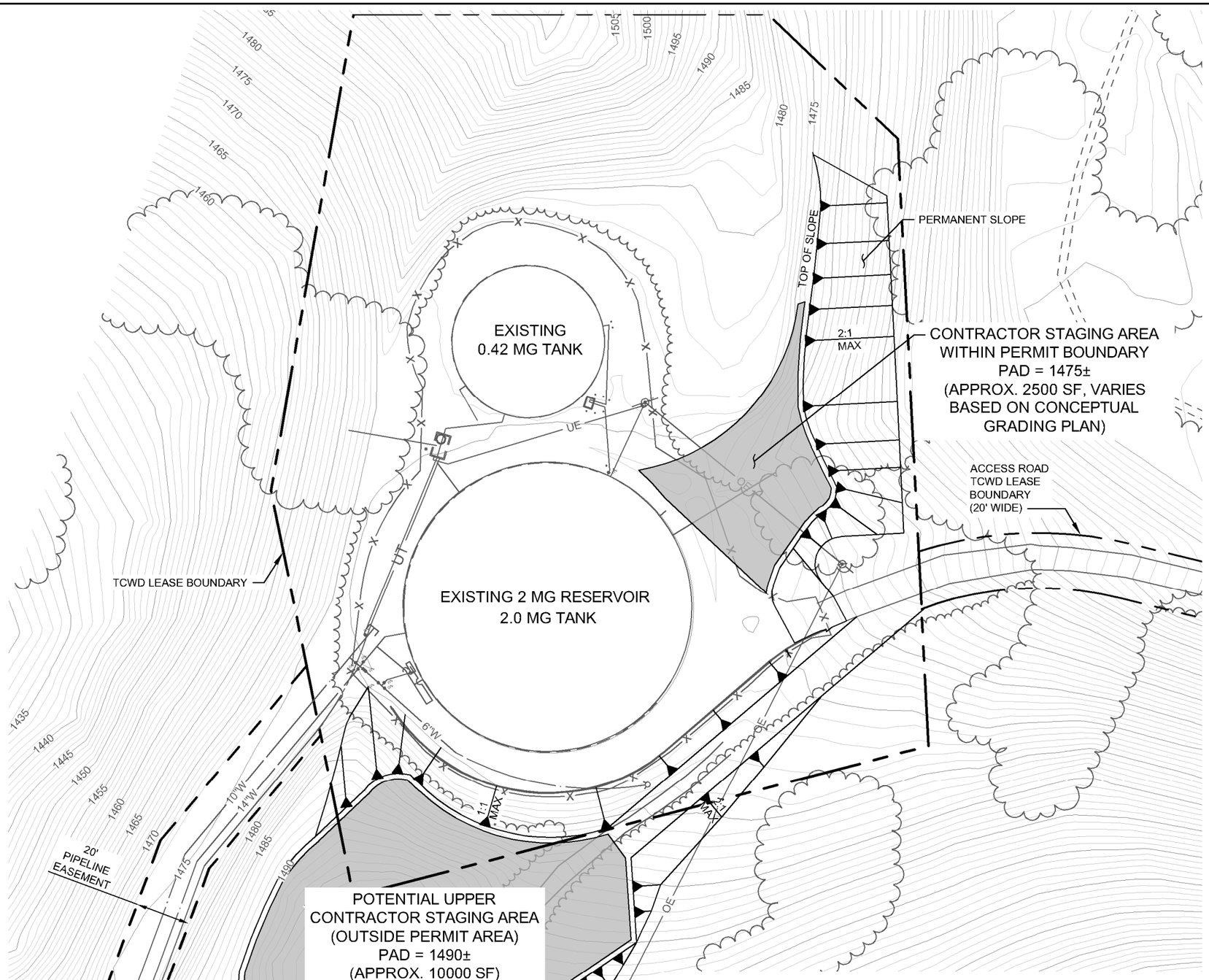
HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

CONTRACTOR SITE ACCESS

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE 5-1

Bar Measures 1 inch



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HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

CONTRACTOR STAGING PLAN

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
5-2

Bar Measures 1 inch

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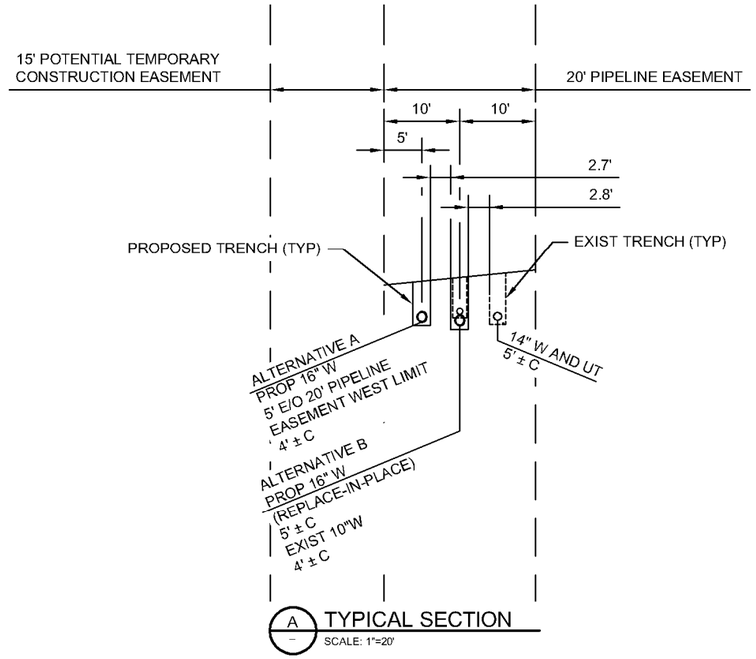
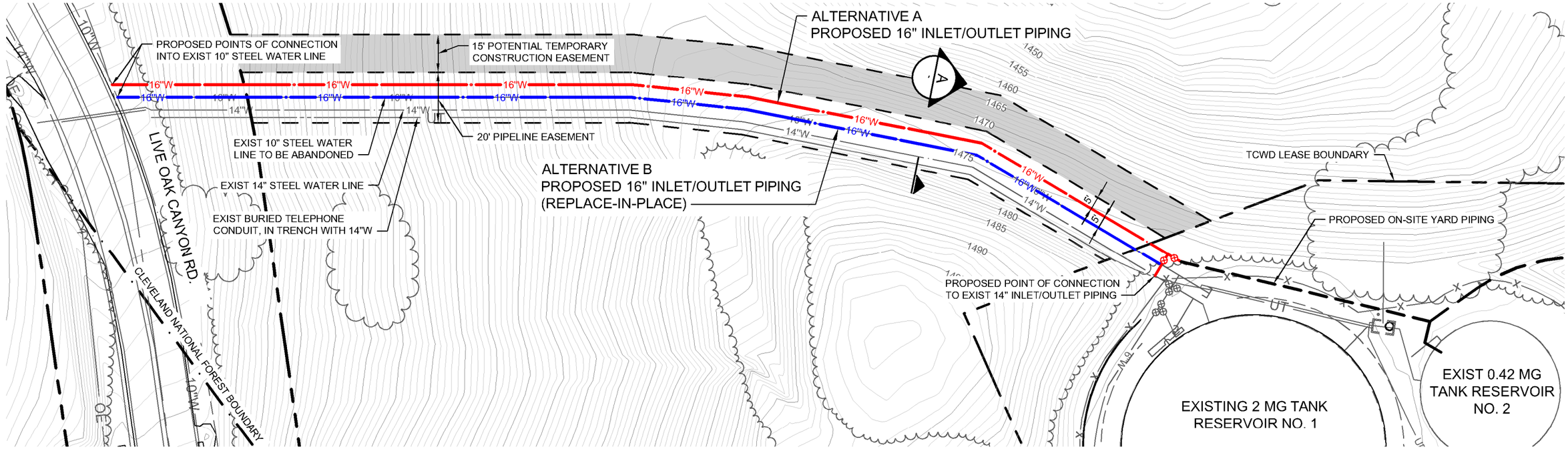


A TYPICAL SECTION
SCALE: 1"=20'



0 20' 40'
SCALE: 1" = 40'

TETRA TECH
www.tetratech.com
17885 VON KARMAN AVENUE, SUITE 500
IRVINE, CA 92614
(949) 809-5000

TRABUCO CANYON WATER DISTRICT
HARRIS GRADE RESERVOIR REPLACEMENT FEASIBILITY STUDY

CONCEPTUAL 16-INCH PIPELINE ALIGNMENTS

Project No.:	200-09339-20001
Date:	AUGUST 2020
Designed By:	KMB

FIGURE
5-3

Bar Measures 1 inch

8/26/2020 2:24:06 PM - O:\PROJECTS\IRVINE\09339\200-09339-20001\CAD\CONCEPTUAL\C-702C- (FIG 5-3) 16-INCH-PIPE-TO-LIVE-OAK.DWG - LERMA, JACKIE

Appendix C. Anticipated Environmental Permits

Requirement	Authority	Explanation
Federal		
Environmental Impacts	National Environmental Policy Act (NEPA)	Projects which require federal action must comply with the NEPA, including disclosure of the potential environmental impacts of the Project through an Environmental Assessment (EA) or Environmental Impact Statement (EIS), and a process of public and agency review and comment. Federal actions which require review under NEPA include federal funding, interconnection to a federal power marketing agency, or issuance of a federal permit such as an ITP under the ESA. *Triggered by project location on federal land; will need to explore potential "categorical exclusions" of the U.S. Forest Service that could apply. Otherwise likely to require preparation of an EA.*
Biological Resources - Endangered Species	Endangered Species Act (ESA)	The ESA and its implementing regulations in Title 50 CFR Section 17 prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. Species can be listed as endangered, threatened, proposed for listing (proposed for listing in Federal Register), or candidates for listing (where listing is warranted, but precluded by higher priority listing activities). *This project is likely to need a biological assessment of the property and adjacent habitat since there is potential for undisturbed habitat. If threatened or endanger species (or habitat) are found, an Incidental Take Permit (ITP) may be required for each species identified.*
Biological Resources - Migratory Birds	Migratory Bird Treaty Act (MBTA)	The MBTA implements the Unites States' obligations under four treaties for the protection of migratory birds. The MBTA is administered by the USFWS, which maintains a list of all species protected by the MBTA (50 CFR Section 10.13). This list includes over 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines. *A biological assessment would also address potential for impacts to migratory bird species. If any are found to be present, or if suitable habitat is identified, an Incidental Take Permit (ITP) may be required for each species so identified.*
Biological Resources - Eagle Protection	Bald and Golden Eagle Protection Act (BGEPA)	The BGEPA prohibits the take, sale, purchase, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof, 16 USC Section 668. The BGEPA also defines take to include "pursue, shoot, shoot

Requirement	Authority	Explanation
		at, poison, wound, kill, capture, trap, collect, molest, or disturb," 16 USC Section 668c, and includes criminal and civil penalties for violating the statute. See 16 USC Section 668. The term "disturb" is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (50 CFR Section 22.3). *A biological assessment also addresses potential for impacts to either bald or golden eagles. If either species is identified in the area, or if suitable habitat is found, an Incidental Take Permit (ITP) could be required (though is not likely).*
Cultural Resources	National Historic Preservation Act (NHPA)	The NHPA requires that federal agencies consider the effects of their proposed actions on historic properties (cultural resources eligible for inclusion in or listed on the NRHP). Generally, any project which requires federal permits, monies, or lands will require review under Section 106. This process involves surveys for archaeological resources, historic built environment resources, and traditional cultural properties, and consultation with state and tribal historic preservation staff. The NRHP recognizes both historical-period and prehistoric properties, including archaeological sites, that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more established criteria *A cultural resources survey will likely be necessary to evaluate the potential for archaeological resources on site, and whether or not any of the structures located on site have historical significance.*
State of California		
Environmental Impacts	California Environmental Quality Act (CEQA)	CEQA) was enacted in 1970 by the California Legislature for decision-makers and the public to be made aware of anticipated significant environmental effects of a proposed project and identify possible ways to avoid or minimize those significant environmental effects by recommending mitigation measures or feasible alternatives to the project. In accordance with CEQA all "projects" within the State of California are required to undergo environmental review to determine potential impacts associated with implementation of the project (see California Public Resources Code, Sections 21000 through 21189). The "Lead Agency" under CEQA is required

Requirement	Authority	Explanation
		to conduct an environmental review to analyze the potential environmental effects associated with proposed projects located within the jurisdiction. *A CEQA review and document preparation will be needed, and the potential impacts defined primarily through the biological and cultural resource assessments will establish the level of assessment; whether an Initial Study/Mitigated Negative Declaration (IS/MND) is possible or a full Environmental Impact Report (EIR) is needed. If possible, a combined federal and state assessment document is preferred.*
Biological Resources - Endangered Species	California Endangered Species Act (CESA)	The CESA establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under the CESA. For projects that would affect a listed species under both the CESA and the ESA, compliance with the ESA would satisfy the CESA if the CDFW determines that the federal incidental take authorization is "consistent" with the CESA under California Fish and Game Code Section 2080.1. For projects that would result in take of a species listed under the CESA only, the project operator would have to apply for a take permit under Section 2081(b). *The biological assessment performed for the site will address species of concern at both the federal and state levels. Results will determine what safeguards, if any, are needed for state-listed species.*
Cultural Resources	California Public Resources Code, Section 5024.19(a)	The California Register of Historical Resources (CRHR) was created in 1992 and implemented in 1998 as "an authoritative guide in California to be used by State and local agencies, private groups, and citizens to identify the State's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys or designated by local landmarks programs, may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission

Requirement	Authority	Explanation
		determines that it meets one or more established criteria, which are modeled on NRHP criteria. *The cultural assessment performed for the site will address concern at both the federal and state levels. Results will determine what resources may be present, if any, and what protection measures may be necessary prior to project implementation.*
Construction Stormwater Permit	Federal Clean Water Act (CWA), National Pollutant Discharge Elimination System (NPDES); jointly administered by the California Regional Water Quality Control Board (RWQCB), Santa Ana, and the Orange County Department of Public Works.	If one or more acres of land are proposed to be disturbed and have a point source discharge of storm water to Waters of the State, a National Pollutant Discharge Elimination System (NPDES) Permit must be obtained. State Water Resources Control Board establishes policies and regulations that help protect and restore the water quality in California, coordinates with and supports RWQCB efforts, and reviews their actions. The RWQCBs monitor and enforce state and federal plans, policies, and regulations. Each RWQCB makes critical water quality decisions for its region. *The NPDES program provides for Construction General Permits. Most construction projects that disturb 1 acre of land or more are required to obtain coverage through an NPDES General Permit for Construction Activities (or Construction General Permit), which requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP).*
Orange County		
Water Quality	Local NPDES program and the County of Orange, the Orange County Flood Control District, and cities of Orange County (the Permittees).	A Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) are provided by the County to aid development project proponents in addressing post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects that qualify as Priority Projects. The criteria for defining a "Priority Project" is provided in the Model WQMP and TGD. These documents describe the process that developers should follow in preparing a Project WQMP for individual new development and significant redevelopment projects. A Project WQMP is a plan for minimizing the adverse effects of urbanization on site hydrology, runoff flow rates and pollutant loads. It also includes measures to help reduce the impacts from "hydromodification." *A project specific WQMP and Erosion and Sediment Control Plan (ESCP) will likely be needed for this project.*

Not expected to be necessary for the proposed project at this location are the following:

- Wetland Permit, Section 404 WQA (U.S. Army Corps of Engineers)
- Water Quality Certification, Section 401 WQA (RWQCB),
- Lake and Streambed Alteration Agreement (CDFW),
- Conditional Use Permit, or other Land Use Zoning adjustment (Orange County).

TETRA TECH

September 18, 2020

Ms. Lorrie Lausten, P.E., District Engineer
Trabuco Canyon Water District
32003 Dove Canyon Drive
Trabuco Canyon, CA 92679

Reference: Harris Grade Reservoir Siting Study – Amendment Request
Porter Property Planning Level Construction Cost Estimate

Dear Ms. Lausten:

Tetra Tech has been providing engineering consulting services to complete the Harris Grade Reservoir Siting Study. During the completion of the siting study, Trabuco Canyon Water District (District) requested Tetra Tech to prepare a planning level construction cost estimate for a new domestic water storage tank at the District's Porter Property. Tetra Tech respectfully submits the following scope of work and fee for the requested additional work.

SCOPE OF WORK

Task 1: Prepare Planning Level Construction Cost Estimate

Tetra Tech will prepare a planning level estimate of probable construction costs for a new 2.7 MG domestic water storage tank and PVC inlet/outlet pipeline located at the District's Porter Property. A technical memorandum will be prepared to present the estimate and assumptions.

Tetra Tech will prepare the planning level construction cost estimate using the following available information:

- Engineering Study (Draft) for Dove Canyon and Robinson Ranch Recycled Water Pump Station Rehabilitation – Phase 1 (Engineering Study)
- Preliminary Porter Property road alignment over Google Earth image received from the District on September 3, 2020
- Domestic Water Storage and Reservoir Siting Study, March 2016
- Available USGS elevations and images to approximate elevation and location of the tank pad and pipeline alignment

We have assumed an electronic PDF deliverable of the technical memorandum and one meeting to discuss the information presented in the memorandum. A draft memorandum will be delivered 6 weeks from the notice to proceed.

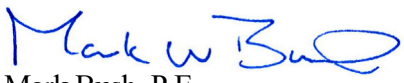
17885 Von Karman Avenue, Suite 500, Irvine, CA 92614-5227
Tel 949.809.5000 Fax 949.809.5010tetratech.com

FEE

Tetra Tech is ready to immediately proceed and begin this work upon receipt of Notice-to-Proceed from the District. We are prepared to perform the above scope of work for a fee of **$11,880** per the attached price proposal and the hourly charge rate and expense reimbursement schedule contained within our current contract with the District. If this proposal is acceptable to you, please sign in the space provided and return one copy to our office.

Should you have any questions, please do not hesitate to contact me at (949) 809-5154 to discuss the elements of our scope of work.

Sincerely,



Mark Bush, P.E.
Vice President

MWB/KMB

Attachment

P:\09339\200-09339-20001\ProjMgmt\Correspondence\ltr001-PorterAdditional.docx

RECEIPT OF THIS PROPOSAL IS ACKNOWLEDGED AND THE CONDITIONS CONTAINED HEREIN ARE ACCEPTED BY TRABUCO CANYON WATER DISTRICT.

APPROVED FOR: Trabuco Canyon Water District DATE: _____

BY: _____ TITLE: _____

Price Proposal

Porter Property Planning Level Construction Cost Estimate

Submitted to: Trabuco Canyon Water District

Contract Type: T&M

Project Phases / Tasks	Schedule From	Schedule Thru	Schedule Months	Work Days Off	Work Days	Total Labor Hrs	Principal in Charge (Mark Bush)	Project Manager 1 (Kyle Bohn)	Design Engineer (Jackie Lerma)	Sr CAD Designer 2 (Willie Johnson)	Admin (Deana Escamilla)	Labor Rate Esc.	Labor	Subs	Travel	Mat'ls & Equip	ODCs	Task Pricing Totals
Bill Rate >							340.00	185.00	115.00	150.00	110.00							
Proj Area >																		
						69	7	30	22	8	2	0.00%	11,880	-	-	-	-	11,880
Porter - Planning Level Estimate						**69**	**7**	**30**	**22**	**8**	**2**		**11,880**	**-**	**-**	**-**	**-**	**11,880**
General Project Management and QA/QC						8	4	4					2,100					2,100
Meetings (1)						3	1	2					710					710
Review data (USGS, Reports, etc)						30	2	8	12	8			4,740					4,740
Technical Memorandum						28		16	10		2		4,330					4,330
Totals						**69**	**7**	**30**	**22**	**8**	**2**	**0.00%**	**11,880**	**-**	**-**	**-**	**-**	**11,880**

Price Summary / Totals

Task Pricing Totals	11,880
Specify Add'l Fees on Setup	0
Technology Use Fee	
Total Price	**11,880**

Pricing by Resource

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS

ITEM 6: SKYRIDGE AT LENNAR HOMES OF CALIFORNIA, INC. – ACCEPTANCE OF WATER, NON-DOMESTIC WATER, AND SEWER FACILITIES CONSTRUCTED IN TRACT NO. 17392 AND OFF-SITE IMPROVEMENTS

Lennar Homes of California, Inc., (Developer) has completed the residential neighborhood known as Skyridge Development. The Skyridge Development consists of 84 residential homes located within the City of Mission Viejo on the east side of El Toro Road between Ridgeline Road and Glenn Ranch Road, and within Trabuco Canyon Water District's (TCWD) service area.

The developer has paid all required developer impact fees and has installed the required on-site and off-site water, wastewater, and non-domestic water infrastructure and has submitted the required Grant of Easement in accordance with the Agreement for Construction of Water and Sewer Facilities (Application for Water Service) dated August 19th, 2015.

FUNDING SOURCE:
Developer Funded

FISCAL IMPACT
By Developer

ENVIRONMENTAL COMPLIANCE:
By Developer

RECOMMENDED ACTION(S):

1. *Committee to receive information at the time of the Committee Meeting.*
2. *Recommend the Board of Directors accept water, non-domestic water, and sewer facilities constructed in Tract No. 17392 and Off-Site Improvements (Skyridge by Lennar Homes of California) by resolution (Action Calendar).*

EXHIBIT(S):

1. Bill of Sale

CONTACTS (staff responsible): PALUDI/LAUSTEN

TRABUCO CANYON WATER DISTRICT
BILL OF SALE
SEWER SYSTEM FACILITIES

FOR GOOD AND VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, **Lennar**, the undersigned does hereby transfer and convey to the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following, and its successors and assigns, all right, title, and interest in and to the sewer installation including mains, manholes, laterals and other appurtenances to said sewer installation, constructed, installed, and located in the property described below, and further warrants that the same is free and clear of any encumbrances and/or liens.

Said property is described as follows:

Tract No. 17392

Executed this _____day of _____, 2020.

Company or Corporation Name:

_____

By: _____

Title: _____

By: _____

Title: _____

CERTIFICATE OF ACCEPTANCE

As per **Resolution No.** 2020-_____as set forth in the minutes of the meeting of the Board of Directors of Trabuco Canyon Water District held on **October 16, 2020** the above Bill of Sale of Sewer System Facilities, dated _____, is hereby accepted by order of the Board of Directors of the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following.

Date of Acceptance: _____.

By: _____
General Manager

TRABUCO CANYON WATER DISTRICT

TRABUCO CANYON WATER DISTRICT
COST OF CONSTRUCTION STATEMENT
SEWER SYSTEM

Developer's Name _Lennar_____

Tract/Parcel No. _17392_____Date Prepared _9/24/2020_____

DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST
48" Manhole (Detail B)	1	EA	2,750.00	$ 2,750
HDPE Pipe Connection to Manhole	3	EA	400.00	$ 1,200
48" Manhole (Detail A-1 and A-2)	24	EA	4,000.00	$ 96,000
8" PVC (SDR-35)	3,457	LF	37.00	$ 127,909
6" PVC (SDR-35)	141	LF	23.00	$ 3,243
4" PVC (SDR-35) Lateral	82	EA	500.00	$ 41,000
Cleanout	2	EA	900.00	$ 1,800
4" PVC (SDR-35) Flat WYE	1	EA	600.00	$ 600
4" PVC (SDR-35 Extended Flat WYE)	1	EA	600.00	$ 600
10" HDPE Pipe	154	LF	40.00	$ 6,160
Rem. & Replace AC Pvmt.	550	SF	13.50	$ 7,425
Rem. & Replace Curb & Gut.	20	LF	20.00	$ 400
Concrete Encasement	21	LF	30.00	$ 630
Plug End Pipe	1	EA	50.00	$ 50

[ ] See attached exhibit

GRAND TOTAL INSTALLATION COST* $289,717

* Excludes fees paid directly to Trabuco Canyon Water District

Prepared by ___Adams-Streeter Civil Engineers_____

My signature as witnessed here below attests that the above statement is true and correct to the best of my knowledge.

Date: _____

_____
Developer

_____
Official Title

TRABUCO CANYON WATER DISTRICT
BILL OF SALE
WATER SYSTEM FACILITIES

FOR GOOD AND VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, **Lennar**, the undersigned does hereby transfer and convey to the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following, and its successors and assigns, all right, title, and interest in and to the water installation including mains, valves, hydrants, laterals and other appurtenances to said water installation, constructed, installed, and located in the property described below, and further warrants that the same is free and clear of any encumbrances and/or liens.

Said property is described as follows:

Tract No. 17392

Executed this _____day of _____, 2020.

Company or Corporation Name:

_____

By: _____

Title: _____

By: _____

Title: _____

CERTIFICATE OF ACCEPTANCE

As per **Resolution No.** 2020-_____as set forth in the minutes of the meeting of the Board of Directors of Trabuco Canyon Water District held on **October 16, 2020** the above Bill of Sale of Sewer System Facilities, dated _____, is hereby accepted by order of the Board of Directors of the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following.

Date of Acceptance: _____.

By: _____
General Manager

TRABUCO CANYON WATER DISTRICT

TRABUCO CANYON WATER DISTRICT
COST OF CONSTRUCTION STATEMENT
WATER SYSTEM FACILITY

Developer's Name _Lennar_____

Tract/Parcel No. _17392_____Date Prepared _9/24/2020_____

DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST
12" SMWD Connection (12" tapping sleeve and 8" valve)	2	EA	2,000.00	$ 4,000
8" PVC C-900 (CL-200)	3,917	LF	32.00	$ 125,344
1" Copper Water Service with 3/4" meter	84	EA	1,050.00	$ 88,200
8" TEE and Thrust Block	4	EA	400.00	$ 1,600
8" Gate Valve and Valve Box	16	EA	1,150.00	$ 18,400
Pipe Bend Fittings	18	EA	500.00	$ 9,000
End of Line Plug with Thrust Block	5	EA	1,500.00	$ 7,500
Fire Hydrant Assembly	13	EA	6,000.00	$ 78,000
2" Blow Off	1	EA	1,250.00	$ 1,250
DG Trail Replacement	135	SF	5.00	$ 675
Wood Fence Replacement	10	LF	100.00	$ 1,000
10" HDPE PE4710 DR11 Water Line	148	LF	40.00	$ 5,920
6" PVC C-900 (CL-200) Water Line	28	LF	27.00	$ 756
6" Gate Valve and Valve Box	1	EA	1,550.00	$ 1,550
8"X6" TEE and Thrust Block	1	EA	400.00	$ 400
1" Combination Air Release and Vacuum Valve Assembly	6	EA	2,700.00	$ 16,200
10" HDPE 22.5° Bend and Thrust Block	2	EA	500.00	$ 1,000
8" PVC to 10" HDPE Pipe Joint	2	EA	1,000.00	$ 2,000

[ ] See attached exhibit

GRAND TOTAL INSTALLATION COST* $ 362,795

* Excludes fees paid directly to Trabuco Canyon Water District

Prepared by ___Adams-Streeter Civil Engineers_____

My signature as witnessed here below attests that the above statement is true and correct to the best of my knowledge.

Date: _____

_____
Developer

_____
Official Title

TRABUCO CANYON WATER DISTRICT
BILL OF SALE STATEMENT
NON-DOMESTIC WATER SYSTEM FACILITY

FOR GOOD AND VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, **Lennar**, the undersigned does hereby transfer and convey to the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following, and its successors and assigns, all right, title, and interest in and to the non-domestic water installation including mains, valves, laterals and other appurtenances to said non-domestic water installation, constructed, installed, and located in the property described below, and further warrants that the same is free and clear of any encumbrances and/or liens.

Said property is described as follows:

Tract No. 17392

Executed this _____day of _____, 2020.

Company or Corporation Name:

_____

By: _____

Title: _____

By: _____

Title: _____

CERTIFICATE OF ACCEPTANCE

As per **Resolution No.** 2020-_____as set forth in the minutes of the meeting of the Board of Directors of Trabuco Canyon Water District held on **October 16, 2020** the above Bill of Sale of Sewer System Facilities, dated _____, is hereby accepted by order of the Board of Directors of the Trabuco Canyon Water District, a County Water District organized and operating pursuant to Water Code Section 30000 and following.

Date of Acceptance: _____.

By: _____
General Manager

TRABUCO CANYON WATER DISTRICT

TRABUCO CANYON WATER DISTRICT
COST OF CONSTRUCTION STATEMENT
NON-DOMESTIC WATER SYSTEM FACILITY

Developer's Name _Lennar_____

_

Tract/Parcel No. _17392_____Date Prepared _9/24/2020_____

DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST
4" PVC C-900 (CL-200) Pipe	561	LF	$20.00	$ 11,220
4" Non Domestic Water Service	1	EA	$2,000.00	$ 2,000
Back Flow Preventer	1	EA	$2,500.00	$ 2,500
Pipe Bend Fitting	4	EA	$200.00	$ 800
Pipe Slope Anchor	10	EA	$500.00	$ 5,000
End Plug with Service Connection	1	EA	$1,000.00	$ 1,000

[ ] See attached exhibit

GRAND TOTAL INSTALLATION COST* $22,520

* Excludes fees paid directly to Trabuco Canyon Water District

Prepared by ___Adams-Streeter Civil Engineers_____

My signature as witnessed here below attests that the above statement is true and correct to the best of my knowledge.

Date: _____

_____
Developer

_____
Official Title

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS
ITEM 7: OTHER ENGINEERING AND OPERATIONS PROJECT UPDATES

1. The Oaks at Trabuco Development
2. Calendar Year 2019 Water Loss Audit
3. Cell Site Management Agreement
4. Trabuco Creek Bridge Rehabilitation Project
5. Silvertree Lane Pipeline Replacement
6. Other Projects

RECOMMENDED ACTION:
Committee to receive project status updates at time of the Committee Meeting.

EXHIBIT(S):
1. Trabuco Canyon Bridge Alternative
2. Silvertree Bid Construction Summary

CONTACTS (staff responsible): PALUDI/PEREA/LAUSTEN

DESIGN STANDARDS

AASHTO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS", 7TH EDITION

DESIGN SUMMARY

DESIGN SPEED = 35 MPH
CURVE DESIGN SPEED (V) FROM AASHTO'S TABLE 3-10 e_{MAX} = 10%
MINIMUM SHOULDER TAPER LENGTH = $WS^2/60$ (AASHTO EQUATION 3-39)

SUMMARY OF IMPACTS

- UTILITY POLES AND VALVES
- FENCES AND GATES
- TREES
- ROSE CANYON ROAD APPROACH
- PARKING LOT ACCESS

~4' deep within vault, above ground backflow serves Upper Mesa (ONRP) 220psi

SCALE 1" = 50'

CURVE (1)
R = 300
e = 10%
V = 35 MPH (AASHTO)

IMPACTED UTILITY VALVES

ROSE CANYON ROAD

CREEK

IMPACTED FENCE & GATE

DIRT PARKING AREA

TRABUCO CANYON ROAD (Exist)

TRABUCO CANYON ROAD TRAIL

IMPACTED TREES

TRABUCO CANYON ROAD

IMPACTED UTILITY POLES

IMPACTED TREE

IMPACTED FENCE & GATE

IMPACTED TREES

PROPOSED BRIDGE

TRABUCO

IMPACTED UTILITY VALVES

CURVE (2)
R = 100'
e = 10%
V = 20 MPH (AASHTO)
NEED ADVISORY SIGN

20 M.P.H.

TRABUCO CANYON ROAD

LEGEND

- IMPACTS
- EXISTING R/W
- APPROXIMATE DAYLIGHT LINE

TRABUCO CANYON ALIGNMENT STUDY
ALTERNATIVE 1 DESIGN AND IMPACTS

DATE: August 7, 2020

TRABUCO CANYON WATER DISTRICT

Bid Comparison

2020-SilverTree Lane 8" Water Main Replacement

				GCI Construction		Ferreira Construction	
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total Price**	**Unit Price**	**Total Price**
1	8" PVC DR14 C900	1,250.00	LF	$202.00	$252,500.00	$164.00	$205,000.00
2	1" Water Service- reconnect only	28	EA	$1,800.00	$50,400.00	$1,733.00	$48,524.00
3	6" Fire Hydrant	3	EA	$13,500.00	$40,500.00	$12,600.00	$37,800.00
4	8" Gate Valve	6	EA	$3,000.00	$18,000.00	$2,800.00	$16,800.00
5	10" Gate Valve	2	EA	$3,500.00	$7,000.00	$3,860.00	$7,720.00
6	Tie into existing Main	2	EA	$7,500.00	$15,000.00	$9,280.00	$18,560.00
7	Abandon Connection to old Main	2	EA	$4,000.00	$8,000.00	$7,150.00	$14,300.00
8	T-Cut Final Pave	6,096.00	SF	$4.05	$24,688.80	$8.00	$48,768.00
				Grand total:	**$416,088.80**		**$397,472.00**

Notes:

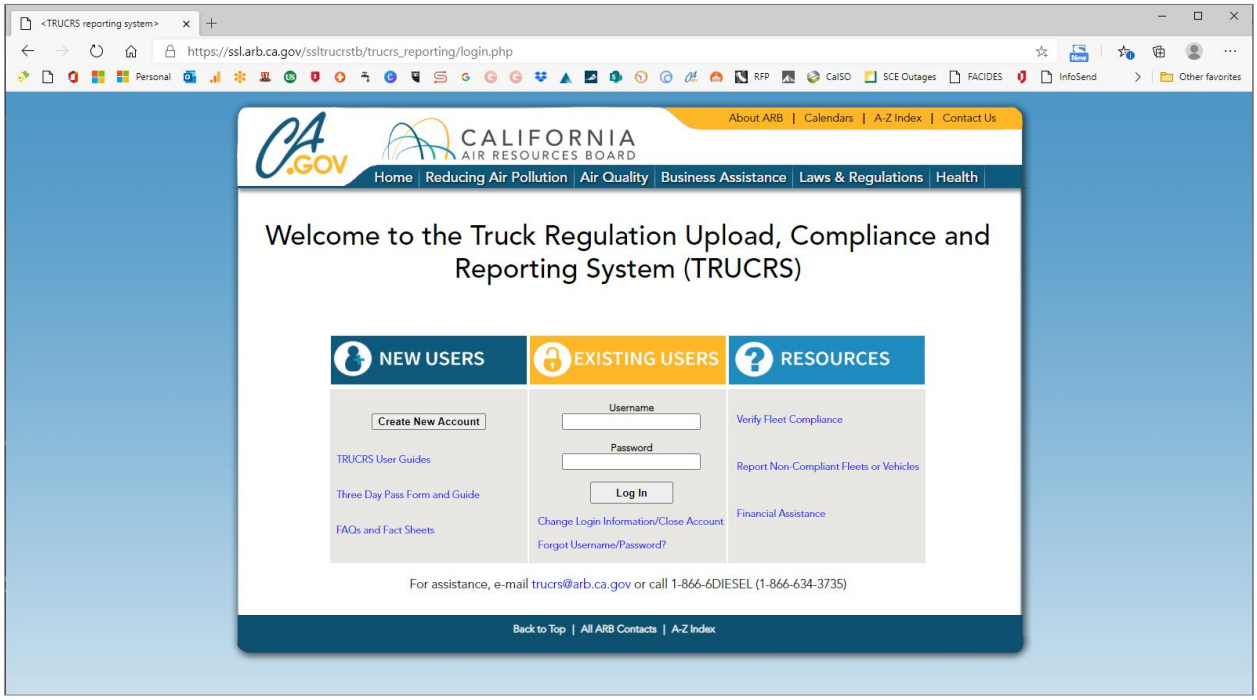
1 Pressure testing and Chlorination/Dechlorination of new water line
2 Installation, materials, and all labor included in bid items.
3 Bid Item 1: Backfill is imported material-SE 30 sand in the pipe zone, CAB in the trench zone, cold mix trench included in item
4 Bid item 8: Final T-cut Paving per City's revised requirements 6" Thick x 4' wide final pave.
5 Mobilization and Demobilization shall be included in above items. Include prevailing wage and performance/materials bond.
6 Compaction testing, surveying, permits, Inspection, traffic control plan, dewatering will be provided by the District
7 Includes striping on Heritage and Silvertree
8 Material to be hauled to TCWD site 15 minutes from jobsite location.
9 Materials shall be per TCWD Specification and approved by the District Engineer.

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

ENGINEERING MATTERS
ITEM 8: DISCUSSION CONCERNING CALIFORNIA AIR RESOURCES BOARD (CARB) TRUCK REGULATIONS, COMPLIANCE, AND REPORTING SYSTEM IMPACTS TO DISTRICT HEAVY-DUTY FLEET VEHICLES

BACKGROUND

Trabuco Canyon Water District (District) owns and operates many different types of vehicles and equipment to complete a variety of services, tasks, and repairs in its service area. The types of vehicles include both light vehicles and trucks, as well as heavy duty vehicles and related equipment. In California, heavy-duty vehicles and equipment are subject to certain regulations by the South Coast Air Quality Management District (AQMD) [http://www.aqmd.gov/] and California Air Resources Board (CARB)[https://ww2.arb.ca.gov/]. Under the direction and authority of the California Legislature, CARB is *"tasked with developing and adopting the specific rules and regulations needed to achieve healthful air quality"*. In conjunction with State emissions regulations, CARB has developed an online portal system called *Truck Regulation Upload Compliance and Reporting System* (TRUCRS) system for tracking and reporting on heavy-duty vehicles and equipment that are used throughout the state.



CARB TRUCRS Online Portal Login Webpage

District Maintenance Department staff are responsible for entering and maintaining the heavy-duty fleet vehicle information on the TRUCRS portal in compliance with regulation as shown below:

VEHICLE NO.	ENGINE MODEL YEAR	VEHICLE MAKE & TYPE	COMPLIANCE OPTION	CURRENT USE STATUS
1	2018	Freightliner Crane Truck	PM Filter – Original Equipment	In Use
2	2019	Freightliner Vacuum Truck	PM Filter – Original Equipment	In Use
3	2007	International Vacuum Truck	None	Disposed 09-2020
4	2007	Kenworth Dump Truck	None	Disposed 09-2020
5	2013	Peterbilt Roll Off Truck	PM Filter – Original Equipment	In Use

***Taken from District TRUCRS Account Breakdown – Exhibit X*

As demonstrated in the table above, vehicle nos. 1, 2, and 5 are newer vehicles that are equipped with Diesel Exhaust Fluid (DEF) Systems, which are designed to burn off excess soot in the prefilter unit to comply with CARB emissions regulations, and are currently compliant for the foreseeable future. District staff coordinated for the disposal of vehicle nos. 3 and 4 in accordance with the Board approved Disposal of Surplus Property Other Than Real Property Policy (Policy) as the vehicles were subject to CARB regulatory limitations and restrictions.

In December 2010, CARB adopted the final rulemaking package for heavy-duty vehicles and bus emissions reduction measure (*https://ww3.arb.ca.gov/regact/2010/truckbus10/truckbusappd.pdf*) which required all heavy-duty vehicles to meet the regulations by 2023. The options to meet this requirement under the regulation includes the following options:

1. Replace the affected vehicles with new compliant vehicles.
2. Repower the affected vehicles with "newer, cleaner engines".
3. Retire older vehicles or operate vehicles less often by designating them as low-use vehicles.
4. Retrofit the heavy-duty vehicles with diesel particulate matter (PM) filter reduction equipment by certain deadlines based on the engine model year.

TABLE 3: PROPOSED BACT SCHEDULE FOR HEAVIER TRUCKS

ENGINE MODEL	COMPLIANCE DATES	
	INSTALL PM FILTER BY	2010 ENGINE BY
Pre 1994	N/A	January 1, 2015
1994-1995	N/A	January 1, 2016
1996-1997	N/A	January 1, 2017
1998-2000	January 1, 2012	January 1, 2020
2001-2004	January 1, 2013	January 1, 2021
2005-2006	January 1, 2014	January 1, 2022
2007-2009	**January 1, 2014 if not originally equipped with a PM filter**	**January 1, 2023**

***Any vehicle that is equipped with a PM filter by 2014 would be exempt from the replacement requirements until 2020 and would have to be reported.*

In order for the District to keep these heavy-duty vehicles as part of the fleet, the PM filter reduction equipment would have needed to have been installed no later than January 1, 2014 as indicated in Table 3; this did not occur by that deadline and these specific vehicles are considered non-compliant in accordance with the regulations. As a result, the District is required by law to dispose of these vehicles, or no longer use them in the State, after December 31, 2021. As District staff has disposed of these vehicles in accordance with the Policy, District staff will update the TRUCRS portal to reflect the current fleet modifications to demonstrate regulatory compliance upon receipt of the bill of sale for the disposed vehicles from the independent vendors.

ANTICIPATED STATE REGULATORY IMPACTS TO THE HEAVY-DUTY VEHICLES

On September 23, 2020, Governor Newsom issued Executive Order N-79-20 for the purpose to *"accelerate our actions to mitigate and adapt to climate change, and more quickly move toward our low-carbon, sustainable and resilient future"*.

1. *It shall be a goal of the State that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035. It shall be a further goal of the State that 100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks. It shall be further a goal of the State to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible.*

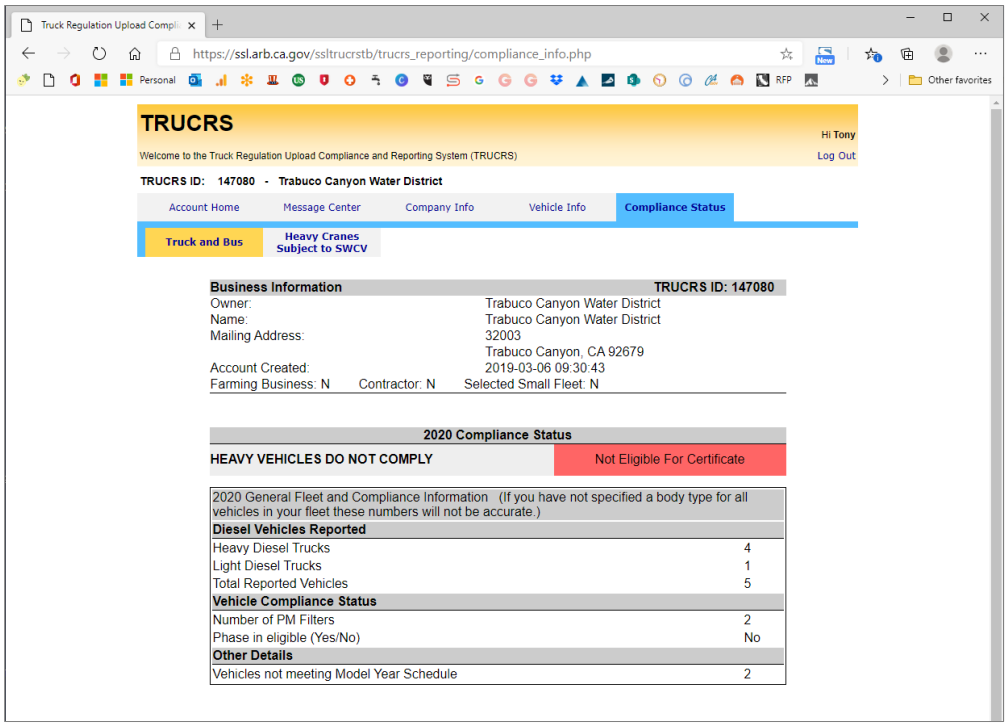
2. *The State Air Resources Board, to the extent consistent with State and federal law, shall develop and propose:*
   a. *Passenger vehicle and truck regulations requiring increasing volumes of new zero-emission vehicles sold in the State towards the target of 100 percent of in-state sales by 2035.*
   b. *Medium- and heavy-duty vehicle regulations requiring increasing volumes of new zero-emission trucks and buses sold and operated in the State towards the target of 100 percent of the fleet transitioning to zero-emission vehicles by 2045 everywhere feasible and for all drayage trucks to be zero-emission by 2035.*
   c. *Strategies, in coordination with other State agencies, U.S. Environmental Protection Agency and local air districts, to achieve 100 percent zero-emission from off-road vehicles and equipment operations in the State by 2035.*

This Executive Order, as it is written, appears to have far-reaching impacts on all types of vehicles sold and used in the State, and will require District staff to re-evaluate its current budgeting for future purchasing of heavy-duty vehicles and equipment that will meet ongoing regulatory compliance.

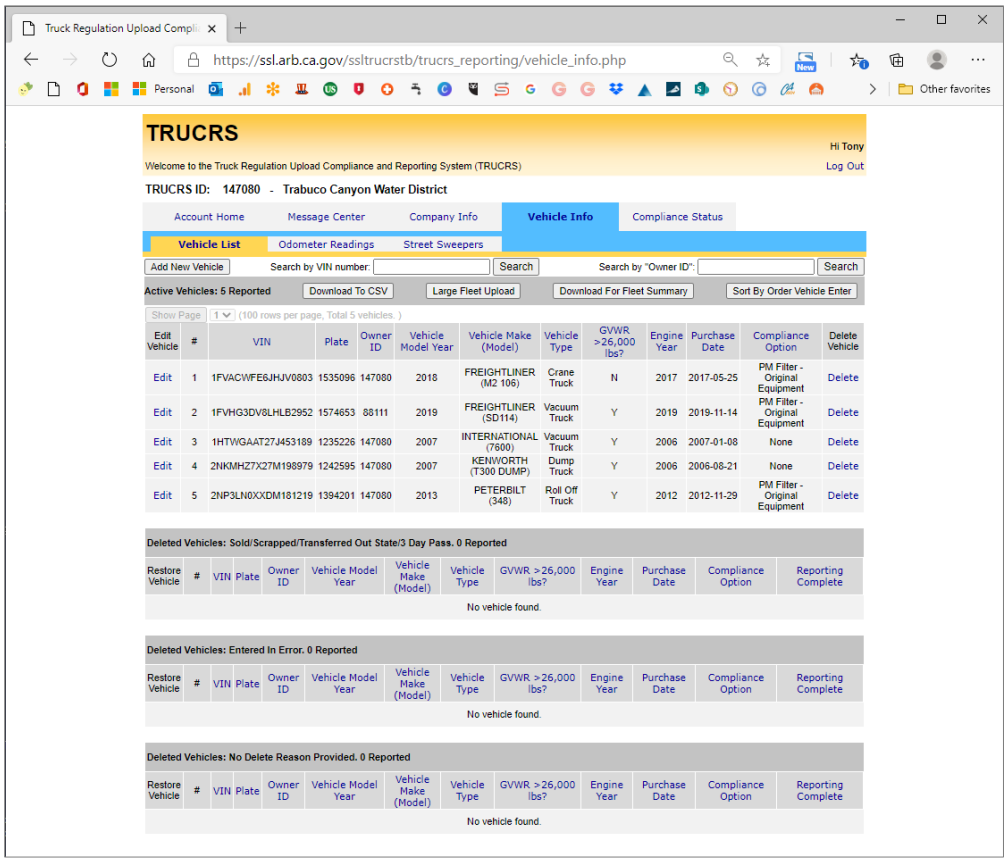
RECOMMENDED ACTION:
Committee to receive information at the time of the Committee Meeting. No action required.

EXHIBITS
1. CARB TRUCRS Portal – District Compliance Status & Fleet Vehicle Information
2. CARB Final Rulemaking Package Appendix D – Proposed Amendments to the Truck and Bus Regulation
3. Executive Order N-79-20

CONTACTS (staff responsible): PALUDI/PEREA/STROUD



TRUCRS Portal – District Compliance Status as of 10-02-2020



TRUCRS Portal – Fleet Vehicle Information

Appendix D

Proposed Amendments to the Truck and Bus Regulation

PROPOSED AMENDMENTS TO THE TRUCK AND BUS REGULATION

On December 12, 2008, the California Air Resources Board (ARB) approved a new regulation to significantly reduce emissions from existing on-road diesel vehicles operating in California. On December 9, 2009, staff provided the Board with an analysis of the impact of the recession on emissions from heavy-duty diesel powered vehicles. This analysis also showed that vehicle activity and emissions are both below the levels estimated when the regulation was developed. The analysis also showed that the 2014 emissions goals could now be met with fewer emission reductions from heavy-duty vehicles and the Board directed staff to develop regulatory provisions to provide economic relief to affected fleets. Finally, based on feedback and comments from affected fleets and other stakeholders, as well as analysis by staff, a number of other provisions of the regulation that require clarification or modification have been identified. Staff believes these clarifications and modifications are appropriate for the successful implementation of the regulation.

A. Existing Regulation

The current regulation requires owners to upgrade their fleets to meet specified best available control technology (BACT) standards for PM and NOx. The BACT standard for PM, phased in from 2011 to 2014, is an engine retrofit with the highest level VDECS (PM filter) or an engine originally equipped with a PM filter by the engine manufacturer. The BACT standard for NOx, phased in from 2013 to 2023, is an engine newly manufactured in 2010 or later or a 2010 emissions equivalent engine.

Fleets may meet the annual requirements by retrofitting vehicles with a PM filter that will achieve PM or NOx reductions, or both, replacing vehicles with newer cleaner ones, or repowering vehicles with newer, cleaner engines. Fleets may also retire older vehicles or operate higher emitting vehicles less often by designating them as low-use vehicles.

During the first four years of the regulation, starting January 1, 2011, fleets are required to install PM filters for certain engine model years so that by 2014 nearly all engines will have a PM filter. The regulation then requires owners to reduce NOx emissions from the fleet by accelerating engine or vehicle replacement or by retrofitting engines starting January 1, 2013. By January 1, 2023, all vehicles would be upgraded to vehicles with 2010 model year engines or equivalent.

Each year, fleets must demonstrate compliance with any of the regulation's three compliance options, and may change compliance options from one year to the next and may use a different option for PM than for NOx. The options are:

(a) A BACT schedule that prescribes which vehicles must be equipped with a PM filter or replaced based on engine model year; or

(b) A BACT percentage limit option that sets the minimum number of PM filters to be installed and the minimum number of vehicles to meet NOx BACT each year; or

(c) A fleet averaging option that allows a fleet to reduce fleet emissions by meeting a fleet average emissions target for PM and one for NOx. The fleet emission targets decline over time so that by 2014, nearly all engines will meet PM BACT and by 2023, all engines will meet NOx BACT.

The regulation never requires the purchase of new vehicles and is structured so that the requirements can be met through the purchase of used vehicles.

The existing BACT compliance schedule allows fleets to comply by installing PM filters and upgrading to 2010 model year equivalent engines according to the schedule shown in Table 1.

Table 1: Best Available Control Technology Compliance Schedule

Compliance Deadline, as of January 1	*Engine Model Years*	*BACT Requirements*
2011	Pre-1994	PM BACT
2012	2003 – 2004	PM BACT
2013	2005 – 2006	PM BACT
	1994 – 1999	NOx and PM BACT
2014	2000 – 2002	NOx and PM BACT
	2007 and later that do not meet PM BACT	NOx and PM BACT
2015	Pre-1994	NOx and PM BACT
2016	2003 – 2004	NOx and PM BACT
	2005 – 2006	NOx and PM BACT
2017	1994 – 1999	NOx and PM BACT
2018	All pre-2007	NOx and PM BACT
2019	All pre-2007	NOx and PM BACT
2020	All pre-2007	NOx and PM BACT
2021	2007 or equivalent	NOx and PM BACT
2022	2008	NOx and PM BACT
2023	2009	NOx and PM BACT

The specific requirements of the BACT Percentage Limit Option are shown in Table 2.

Table 2: Percent of Fleet That Must Comply with PM and NOx BACT Standard

Compliance Deadline As of January 1	Percent of Total Fleet Complying with BACT	
	PM BACT	NOx BACT
2011	25%	N/A
2012	50%	N/A
2013	75%	25%
2014	100%	50%
2015	100%	50%
2016	100%	60%
2017	100%	80%
2018	100%	80%
2019	100%	80%
2020	100%	90%
2021	100%	90%
2022	100%	90%
2023	100%	100%

Small fleets with three or fewer vehicles have an alternative compliance option that delays the first compliance date until January 1, 2014, as described below:

- A one truck owner electing this option is required to have a 2004 model year or newer engine equipped with a PM filter by January 1, 2014.
- A fleet with two trucks is required to have one 2010 model year engine and one truck equipped with a PM filter, or both trucks having a 2004 model year or newer engine and equipped with a PM filter by January 1, 2014.
- A fleet with three trucks can elect to comply by having all vehicles equipped with 2004 model year engines or newer with PM filters by January 1, 2014, or choose to delay the PM filter requirement for one truck until January 1, 2016 if another truck is equipped with a 2010 model year engine by 2014.

All small fleets would need to meet the same BACT schedule as other fleets starting January 1, 2019.

School buses are exempt from any NOx reduction requirements but must meet PM BACT requirements. School buses would have three compliance options to meet PM BACT starting January 1, 2011 so that all school buses would have PM filters by January 1, 2014.

The regulation also includes a number of special provisions that delay some or all of the requirements for certain fleets and vehicle uses. These provisions are available for:

- Low-use vehicles
- Agricultural vehicles
- Vehicles operating exclusively in designated NOx exempt areas

- Motorcoaches
- Unique vehicles

The regulation also provides credits for:

- Vehicle retirements that have occurred since 2008
- Adding fuel efficient hybrid vehicles
- Alternative fueled vehicles
- Early PM retrofit installations

B. Proposed Regulatory Amendments

The proposed amendments would simplify the regulation by eliminating the fleet averaging and percent limit options, by modifying the BACT compliance schedule and proposing a new phase-in option. It would also delay the initial compliance requirements and delay the phase in of 2010 engines. These delays eliminate the need for the NOx exemptions in the current regulation which were based on phasing in the NOx requirements at a later date.

About 150,000 lighter trucks (trucks with a GVWR of 14,001 to 26,000 pounds) would be exempt from the PM BACT requirements and replacement requirements would be delayed for all vehicles until 2015. The proposed amendments would treat heavier trucks (trucks with a GVWR greater than 26,000 pounds) differently than lighter weight trucks.

Other amendments are proposed to reduce or delay compliance requirements for various types of vehicles or uses. Generally, the proposed amendments substantially simplify the regulation while retaining flexibility for fleets to determine which vehicles to retrofit or replace. A more detailed discussion of all the amendments staff is proposing is provided below.

1. Compliance Schedule for Lighter Trucks

Staff is proposing a new requirement for lighter trucks that would exempt them from the PM BACT requirements. Upgrading these vehicles would not be required until the engines are at least 20 years old. Starting January 1, 2015, and continuing each year thereafter until 2020, engines with model years that are 20 years old or older would need to be replaced with a 2010 model year engine or equivalent. Then, from 2020 to 2023, all remaining pre-2010 model year engines would be required to be 2010 model year engine equivalent according to the following schedule.

- 2003 and older engine model years by January 1, 2020
- 2006 and older engine model years by January 1, 2021
- 2009 and older engine model years by January 1, 2022

By January 1, 2023 all vehicles in the fleet must be 2010 model year emissions equivalent. Any vehicle brought into the fleet must be in compliance with the previous year's requirements.

Any vehicle that is equipped with a PM filter by 2014 would be exempt from the replacement requirements until 2020 and would have to be reported.

2. Compliance Schedule for Heavier Trucks

Staff is proposing to amend the existing BACT compliance schedule to phase in the requirement to install diesel particulate filters from 2012 through 2014. Beginning 2015 through 2023, staff is proposing to phase in the requirement to upgrade to 2010 or newer model year vehicles. The proposed amendments would require heavier trucks with 1998 to 2006 model year engines, to meet PM BACT between January 1, 2012 and January 1, 2014. The proposed compliance schedule is shown in Table 3 below.

Table 3: Proposed BACT Schedule for Heavier Trucks

Engine Model	Compliance Dates	
	Install PM Filter By	2010 Engine By
Pre 1994	N/A	January 1, 2015
1994-1995	N/A	January 1, 2016
1996-1997	N/A	January 1, 2017
1998-2000	January 1, 2012	January 1, 2020
2001-2004	January 1, 2013	January 1, 2021
2005-2006	January 1, 2014	January 1, 2022
2007-2009	January 1, 2014 if not originally equipped with a PM filter	January 1, 2023

Any vehicle that is equipped with a PM filter by 2014 would be exempt from the replacement requirements until 2020 and would have to be reported.

3. Phase-in Option for Small Fleets

Staff is proposing to replace the existing optional small fleet provision for fleets with one to three vehicles with a new optional phase-in for vehicles with a GVWR greater than 26,000 pounds that would simplify and ease the requirements. The proposed option is applicable only to heavier trucks. A small fleet would be allowed to delay meeting PM BACT for heavier vehicles until January 1, 2014 and be exempt from meeting the 2010 model year emissions equivalent requirement until January 1, 2020. The simplified requirements for PM filters would follow the schedule shown in Table 4 below.

Table 4: Small Fleet PM Phase-In Option Schedule for Heavier Vehicles

Compliance Date	Vehicles Meeting PM BACT
January 1, 2014	1 vehicle
January 1, 2015	2 vehicles
January 1, 2016	3 vehicles

Beginning January 1, 2020, all vehicles in the fleet would need to comply with the 2010 model year emissions equivalent requirements of the BACT schedule shown in Table 5.

Table 5: Compliance Dates for Heavier Vehicles that Must be Modernized

Engine Model Year	2010 Engine By
2000 and older	January 1, 2020
2001 – 2004	January 1, 2021
2005 – 2006	January 1, 2022
All Vehicles	January 1, 2023

Fleets using this provision are subject to the reporting requirements which have been amended as specified in the revised reporting requirements at the end of this appendix.

4. Phase-in Option for Large Fleets

Staff is proposing a new phase-in option for vehicles with a GVWR greater than 26,000 pounds to provide additional compliance flexibility. The fleets utilizing this provision must report information for all heavier vehicles in the fleet starting January 31, 2012. This option would allow fleets to decide the order in which vehicles would be retrofit and replaced, regardless of their age. This would provide additional flexibility to fleets so they may be able to keep older, more expensive or specialized vehicles in their fleet longer than would be allowed under the BACT schedule. It would also provide flexibility to fleets that have most or all of the vehicles in one or two of the model year ranges in the BACT schedule. The heavier vehicles in the fleet would need to comply with PM BACT according to Table 6.

Table 6: Phase-In Option Schedule

Compliance Date	Vehicles Meeting PM BACT
January 1, 2012	30%
January 1, 2013	60%
January 1, 2014	90%
January 1, 2015	90%
January 1, 2016	All Must Comply with BACT Schedule

Any vehicle brought into the fleet must be compliant with the previous year's requirements. Staff is also proposing to allow fleets with both drayage and non-drayage trucks to include all their vehicles in the phase-in option. Fleets using this provision are subject to the reporting requirements which have been amended as specified in the revised reporting requirements at the end of this appendix.

5. Relief for Fleets that have Reduced their Fleet Size

This amendment would provide expanded credits until 2016 for fleets that have fewer trucks than they had in 2006, and is intended to reduce the annual requirements for fleets most affected by the recession. Until January 1, 2016, and in conjunction with the optional Phase-in schedule for heavier trucks, a fleet would be able to reduce its requirement for a compliance year by the same percentage that the fleet has downsized from its 2006 baseline fleet. Table 7 shows how the fleet size reduction credit would reduce the compliance requirements for a business that has 25 percent fewer vehicles than it did in 2006. Because the fleet is 25 percent smaller, the fleet would subtract 25 percent from the annual phase-in option requirement each year until 2016. The second column in the table shows the phase-in option requirements without credits and the far right column shows the requirements adjusted for a fleet with a 25 percent smaller fleet. If the fleet size changes from year to year the credit would adjust.

Table 7: Example of Relief for Fleet Downsized 25 Percent

Compliance Date	Vehicles Meeting PM BACT (No Credits)	Fleet Size Compared to 2006 Baseline	PM BACT Required for Reduced Fleet
January 1, 2012	30%	-25%	5%
January 1, 2013	60%	-25%	35%
January 1, 2014	90%	-25%	65%
January 1, 2015	90%	-25%	65%
January 1, 2016	All Must Comply with BACT Schedule		

The proposed changes would provide fleets with additional credits by extending the baseline year back from 2008 (the baseline year for determining credits in the current regulation) to 2006. This would provide more credit since nearly all fleets had more vehicles in 2006 than 2008. The proposed amendments would also increase the credit by allowing non-operational vehicles to be counted as retired (that is, excluded from the calculation of fleet size). The credit would also continue until January 1, 2016 rather than expiring January 1, 2014 as provided in the current regulation. To take advantage of these credits, fleets would be required to report information about all trucks over 26,000 pounds GVWR in the fleet and comply with the optional phase-in compliance schedule starting in January 2012.

6. Credits

a) Credits for Early PM Retrofits

Fleets that have already installed a PM filter or install them prior to July 2011 would be able to treat another vehicle as compliant until 2017. This credit would encourage early action and get early emissions reductions, would reward fleets who have already installed PM retrofits, and would spread out retrofit purchases and installations. The vehicle that was retrofitted early would also be compliant until 2020. The proposed amendments would also extend the expiration date of the credit in the existing regulation from 2014 to 2017. However, credits towards another vehicle would not be available for action taken to comply with other regulations or for PM retrofits partially paid for by public funding according to the funding contract terms.

This credit could be used by fleets in a number of ways, for fleets using the optional phase-in compliance schedule, the retrofitted vehicle and the credit would each count towards compliance. For example, a fleet with two early retrofits would be treated as having four PM filters until 2017. Alternatively, a fleet that complies with the BACT requirements and doesn't report could claim the credit by reporting information about the truck equipped with the PM retrofit and the truck that would be treated as compliant using the provided credit. Additionally, a fleet that retrofits a lighter vehicle prior to July 1, 2011, could treat a heavier vehicle as compliant until January 1, 2017.

Overall, the amendment would increase the value of the existing early retrofit credit provision by providing a one for one credit that is good until January 1, 2017, rather than providing a credit like the existing regulation that declines each year until it expires January 1, 2014.

In addition, any lighter or heavier vehicle that has a PM retrofit installed prior to 2014 would be compliant until 2020. Fleets can use this option to keep older trucks until 2020 even if the BACT compliance schedule would require the vehicle to be replaced between 2015 and 2020. Credit towards another vehicle would not be given for partially state funded vehicle retrofits according to the funding program guidelines.

b) Fuel Efficient Hybrids, Alternative Fueled Vehicles, and Heavy-Duty Pilot Ignition Engines

Fleets that purchase fuel efficient hybrid vehicles, alternative fueled vehicles, or vehicles equipped with pilot ignition engines any time prior to 2017 would be able to treat another vehicle as compliant until 2017. This credit could be used with the optional phase-in compliance schedule where the credit for another vehicle would count towards compliance. In addition, a fleet that complies with the BACT requirements and doesn't need to report the entire fleet could claim the credit by reporting information solely about the hybrid vehicle and the vehicle that would be treated as compliant using this credit. Like the early PM retrofit credit, this amendment would increase the value of the credits by providing a one for one credit rather than the credit value in the existing regulation that declines each year. A fleet could receive credit for action taken on a lighter vehicle prior to July 1, 2011 and apply the credit for a heavier vehicle as compliant until January

1, 2017. Credit towards another vehicle would not be given for partially state funded vehicle replacements according to the funding program guidelines.

7. School Bus Provision

Staff is proposing amendments to the school bus provision, which are designed to provide relief while still protecting the children in our state. These amendments will exempt the lighter school buses (buses with a GVWR of 14,001 to 26,000 pounds) from the regulatory provisions and provide a one year delay in the implementation of PM filters for the heavier school buses (buses with a GVWR greater than 26,000 pounds).

The other proposed changes are similar to the relief proposed for other vehicles subject to the regulation. The BACT Percentage Limits option and the Fleet Averaging option would be eliminated and the existing BACT compliance schedule would be replaced with the phase-in compliance schedule shown in Table 8 below.

Table 8: BACT Compliance Schedule for Heavier School Buses

Compliance Deadline, as of January 1	*Minimum Percent of Total Fleet Complying with PM BACT*
2012	33%
2013	66%
2014	100%

The proposed amendments also include credits for installation of a PM filter, such that a heavier school bus would be considered compliant for each lighter school bus that has an OEM filter or a retrofit installed, provided that the funding of those buses allows the use of these credits. The proposed amendments also include credit for one heavier school bus to be considered compliant for each hybrid, heavy-duty pilot ignition, and alternative-fueled school bus over 14,000 pounds GVWR in the fleet, provided that the funding of those buses allows credits. For each school bus that earns any of the credits described above, the fleet could treat another school bus as compliant because of the credit until January 1, 2014. The fleet would be required to keep records on the school buses receiving credit and the school buses to be treated as compliant.

Similar to the proposal for other vehicle categories, staff is proposing a provision that offers economic relief to school bus fleets that have reduced their fleet size relative to their fleet size on October 1, 2006 – the new baseline year proposed in the amended regulation. Until January 1, 2014, a fleet would be able to reduce its requirement in a compliance year by the same percentage that the fleet has downsized from the 2006 baseline fleet. The fleet may include all school buses over 14,000 pounds GVWR when determining this credit. Except for fleets needing a compliance extension based on unavailability of PM filters, staff proposes to require no reporting for school bus fleets – only recordkeeping.

Staff is not proposing to change some of the original components of the regulation including:

(1) The school bus exemption from NOx BACT,
(2) The provision for school buses that cannot be retrofitted with a PM filter, to have until January 1, 2018, to meet PM BACT, and
(3) The requirement for school buses greater than 14,000 lbs GVWR that were manufactured before April 1, 1977, to be retired by January 1, 2012.

8. Agricultural Vehicle Provisions

a) Use of Small Fleet Provisions and other Credits, Exemptions, and Extensions

Staff is proposing to make several changes the agricultural vehicle provision to streamline the language to make the provision easier to understand. The proposed changes would delete the concepts of low and limited mileage vehicles and place the mileage restrictions associated with those vehicles directly into the language of the provisions. Staff is also proposing to redefine the agricultural fleet to include only the vehicles using the agricultural vehicle provisions and not the vehicles that do not qualify for the provision as the regulation is currently written. In addition, Staff is proposing to extend the deadline for reporting agricultural vehicles until March 31, 2011 to allow another opportunity for eligible fleets to apply. Staff is also proposing to amend the definition of an agricultural vehicle to clarify the definitions. The definitions would clarify that any truck transporting a load of unprocessed crops between the farm and the first point of processing would be eligible and would still be eligible if making interim movements between the farm and the processor and would include yard trucks.

Staff is proposing to make a number of smaller changes to the regulation which would separate the vehicles that qualify for the agricultural vehicle provision from the vehicles would not qualify and would need to comply with the general requirements of the regulation. As a result of this change, the vehicles that do not qualify for the agricultural provision would be able to use any of the exemptions, extensions, or credits provided to the fleets that comply with the general requirements of the regulation.

Staff is also proposing to change the definition of specialty agricultural vehicles to remove the restriction that feed trucks or mixer-feed trucks be used exclusively at cattle or calf feedlots. In addition, staff is proposing to amend the language to clarify that when replacing an agricultural vehicle the vehicle being removed from the agricultural vehicle provision may be shifted to the non-agricultural vehicle fleet as long as it complies with the general requirements of the regulation.

Staff is also proposing to extend the deadline for reporting agricultural vehicles until March 31, 2011. The current regulation requires all vehicles that will utilize the agricultural vehicle provisions to report information regarding the business and the vehicles in the fleet by March 31, 2010. The early reporting was necessary because the number of specialty agricultural vehicles in state was capped at 2200 and 1100 in the San Joaquin Valley. However, after analysis of all the vehicles reported it was determined that less that 2200 and 1100 vehicles had requested to be classified as

specialty vehicles. If the number of specialty vehicles reaches the caps, priority will be given to those who reported during 2010. Fleets using this provision are subject to the reporting requirements which have been amended as specified in the revised reporting requirements at the end of this appendix.

b) Provision for Log Trucks

Staff is proposing to add a new provision under the agricultural vehicle section for log trucks and a definition of log trucks in the definitions section. As shown in Table 9, the provision would exempt log trucks from the requirement of installing PM filters, but instead require the log truck fleet to accelerate NOx BACT (replacement to 2010 model year emissions equivalent engines). Instead of phasing in PM filters beginning in 2012, as required by the BACT compliance schedule in the general requirements, log truck fleets would be required to meet NOx BACT at a rate of 10 percent per year from 2014 to 2023. Unlike other agricultural vehicles, log trucks would have no mileage restrictions.

Table 9: Percentage of Log Trucks that must have 2010 Model Year Emissions Equivalent

Compliance Deadline as of January 1	Percent of Total Fleet Complying with BACT
2011	0%
2012	0%
2013	0%
2014	10%
2015	20%
2016	30%
2017	40%
2018	50%
2019	60%
2020	70%
2021	80%
2022	90%
2023	100%

9. Inclusion of Drayage Trucks

Staff is proposing to amend the regulation to allow fleets with drayage trucks to include these trucks along with their other trucks when complying with the Truck and Bus regulation. Drayage trucks must still comply with the Drayage Truck regulation, but fleets would now be able to count cleaner drayage trucks toward the compliance with the Truck and Bus regulation. Staff is also proposing to amend the date by which drayage trucks would be subject to the Truck and Bus regulation from January 1, 2021 to January 1, 2017.

Staff is proposing to amend the Drayage Truck regulation to delay the phase 2 requirements that require drayage trucks to meet or exceed the 2007 engine standards by January 1, 2014. The existing regulation requires all drayage trucks to meet PM BACT by January 1, 2014, so the delay will allow drayage trucks meeting PM BACT to operate at ports and intermodal rail yards until required to upgrade to 2010 model year emissions equivalent engine as required by the Truck and Bus regulation. Staff is proposing that the Drayage Truck regulation sunset on January 1, 2016.

10. Provision for Two-Engine Street Sweepers

Staff is proposing to amend the two-engine sweeper provision to clarify that the auxiliary engine is required to meet PM BACT whenever the drive engine is required to either meet PM BACT or be upgraded to a 2010 model year emissions equivalent. However, street sweepers would need to follow the requirements of the regulation based on the GVWR of the sweeper. Sweepers with a GVWR of 14,001 to 26,000 pounds would follow the requirements for vehicles of that weight class and sweepers with a GVWR greater than 26,000 pounds would follow the requirement for vehicles of that weight class. The operating restrictions for two-engine sweepers greater than 14,000 pounds GVWR with Tier 0 auxiliary engines would remain the same. Fleets using this provision are subject to the reporting requirements which have been amended as specified in the revised reporting requirements at the end of this appendix.

11. Low-Use Vehicle Definition

Staff is proposing to amend the definition of a low-use vehicle to delete the requirement that these vehicles drive less than 1,000 miles and 100 hours in the 12 month period preceding the compliance year. The proposal would change the time period in which the mileage restriction applies from the previous compliance year to the current compliance year. Therefore, if a fleet designates a vehicle on January 1, 2012, as low use, the vehicle cannot operate more than 1,000 miles between January 1 and December 31, 2012. Fleets must report vehicle information annually and the provision expires January 1, 2023.

Staff is also proposing language that would require low-use vehicles operate less than 1,000 miles per year and 100 hours if the vehicle is equipped with power take off that is designed to operate while stationary, such as drill rigs or cranes. Vehicles that have PTO that are operated only to load and unload products such as lift gates would not be subject the 100 hour limitation. Fleets using this provision are subject to the reporting requirements which have been amended as specified in the revised reporting requirements at the end of this appendix.

12. NOx Exempt Area Provisions

Staff is proposing to amend the NOx exempt area provision to allow vehicles that operate exclusively in the NOx exempt area to continue the same exemption as the current regulation but would clarify how the exemption aligns with the proposed changes to general requirements.

Staff is proposing to modify the NOx exempt area provision to show that the proposed change to the general requirements only impact 1997 and older vehicles with a GVWR greater than 26,000 pounds operating in the NOx exempt areas. The narrow impact is a result of the extended deadlines of the general requirements. A separate compliance schedule is being proposed and would identify which model year engines would need to meet PM BACT by which specific calendar year deadlines.

Staff is also proposing to add an optional labeling requirement for fleet owners with 1997 and older vehicles that meet PM BACT rather than requiring reporting.

13. Unique Vehicle Extension

Staff is proposing to add a provision that would replace the unique vehicle provision. The new provision would streamline and clarify that a fleet owner may apply for a one year exemption from replacing the vehicle or engine if:

- A used vehicle or suitable cab and chassis that performs a similar function with a 2010 equivalent emissions engine is not available, and
- A suitable PM filter was not available to be installed by 2014.

14. Deleted Provisions

a) BACT Percent Limits

Staff is proposing to delete the BACT percent limits option which allowed fleets to meet PM and NOx BACT with vehicles of their choice provided they meet the annual percentage set forth in percent limits table and has replaced it with the phase-in option.

b) Fleet Averaging Option

Staff is proposing to delete the fleet averaging option because it is no longer needed.

c) Cab-Over-Engine Trucks with 57' Trailers

Staff is proposing to delete this section because the proposed BACT compliance schedule and phase-in option eliminates the need for this provision. Because the last model year that a cab-over-engine truck was built was 2006, these vehicles can never be replaced with a vehicle that meets the 2010 model year emission equivalent.

d) NOx Mileage Exempt Vehicles

Staff is proposing to delete the provision that provided an exemption from meeting the requirement to upgrade to a 2010 model year emissions equivalent engine for vehicles that traveled less than 7,500 miles per year. This provision is no longer necessary since the proposed amendments allow vehicles that meet PM BACT by 2014, to operate until January 1, 2020, regardless of the annual mileage.

e) Motorcoaches

Staff is proposing to delete this section because the compliance requirements are now reduced under the proposed amendments. The proposed BACT compliance schedule allows an additional two years before requiring fleet to begin to upgrade to 2010 model year engines and provides additional flexibility by allowing the fleets to keep older motor coaches longer. Staff estimates that less than 50% of the vehicles in most motorcoach fleets are 1997 or older, so the proposed BACT compliance schedule would be easier to comply with than the existing motorcoach provision. For this reason staff is proposing to delete the motorcoach provision.

15. Revised Reporting Requirements

a) Reporting Dates for Fleets Claiming Credits

Staff is proposing that fleets only be required to submit information for vehicles that qualify for the agricultural provisions rather than reporting information about all vehicles in the fleet. In addition, staff is proposing to extend the deadline for claiming the agricultural vehicle provisions to March 31, 2011.

Staff is also proposing to amend the reporting requirements for sweepers. The early reporting deadline of March 31, 2010, for fleets with two engine street sweepers remains unchanged; however, staff is proposing that fleets be only required to report information about the two engine street sweepers with Tier 0 engines rather than all two engine sweepers in the fleet.

16. Clarifications and Minor Modifications

Staff is also proposing to modify and make minor modifications to other sections to clarify existing requirements and improve enforceability of the regulation and streamlining reporting and recordkeeping.

a) General Reporting and Record Keeping Requirement Changes

The reporting requirements have been amended to do the following:

- Add the requirements for reporting under the proposed phase-in, credits, and exemption and extension provisions
- Identify new initial reporting dates and new reporting dates for subsequent compliance years
- Identify new information required to demonstrate compliance with proposed new credits
- Modify existing reporting requirements to improve enforceability
- Delete reporting requirements no longer needed for provisions deleted from the regulation

The following record keeping requirements have been amended to improve enforceability:

- Specific that owners who keep records outside of California are subject to the requirements for audits
- Add record keeping and audit requirements for the proposed new compliance options
- Specify that records be kept to verify PM filter's failure and replacement
- Specify that records be kept by owners claiming the emergency support vehicle exemption

EXECUTIVE ORDER N-79-20

WHEREAS the climate change crisis is happening now, impacting California in unprecedented ways, and affecting the health and safety of too many Californians; and

WHEREAS we must accelerate our actions to mitigate and adapt to climate change, and more quickly move toward our low-carbon, sustainable and resilient future; and

WHEREAS the COVID-19 pandemic has disrupted the entire transportation sector, bringing a sharp decline in demand for fuels and adversely impacting public transportation; and

WHEREAS as our economy recovers, we must accelerate the transition to a carbon neutral future that supports the retention and creation of high-road, high-quality jobs; and

WHEREAS California's long-term economic resilience requires bold action to eliminate emissions from transportation, which is the largest source of emissions in the State; and

WHEREAS the State must prioritize clean transportation solutions that are accessible to all Californians, particularly those who are low-income or experience a disproportionate share of pollution; and

WHEREAS zero emissions technologies, especially trucks and equipment, reduce both greenhouse gas emissions and toxic air pollutants that disproportionately burden our disadvantaged communities of color; and

WHEREAS California is a world leader in manufacturing and deploying zero-emission vehicles and chargers and fueling stations for cars, trucks, buses and freight-related equipment; and

WHEREAS passenger rail, transit, bicycle and pedestrian infrastructure, and micro-mobility options are critical components to the State achieving carbon neutrality and connecting communities, requiring coordination of investments and work with all levels of governments including rail and transit agencies to support these mobility options; and

WHEREAS California's policies have contributed to an on-going reduction in in-state oil extraction, which has declined by over 60 percent since 1985, but demand for oil has not correspondingly declined over the same period of time; and

WHEREAS California is already working to decarbonize the transportation fuel sector through the Low Carbon Fuel Standard, which recognizes the full life cycle of carbon in transportation emissions including transport into the State; and

WHEREAS clean renewable fuels play a role as California transitions to a decarbonized transportation sector; and

WHEREAS to protect the health and safety of our communities and workers the State must focus on the impacts of oil extraction as it transitions away from fossil fuel, by working to end the issuance of new hydraulic fracturing permits by 2024; and

WHEREAS a sustainable and inclusive economic future for California will require retaining and creating high-road, high-quality jobs through sustained engagement with communities, workers and industries in changing and growing industries.

NOW THEREFORE, I, GAVIN NEWSOM, Governor of the State of California by virtue of the power and authority vested in me by the Constitution and the statutes of the State of California, do hereby issue the following Order to pursue actions necessary to combat the climate crisis.

IT IS HEREBY ORDERED THAT:

1. It shall be a goal of the State that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035. It shall be a further goal of the State that 100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks. It shall be further a goal of the State to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible.

2. The State Air Resources Board, to the extent consistent with State and federal law, shall develop and propose:

    a) Passenger vehicle and truck regulations requiring increasing volumes of new zero-emission vehicles sold in the State towards the target of 100 percent of in-state sales by 2035.

    b) Medium- and heavy-duty vehicle regulations requiring increasing volumes of new zero-emission trucks and buses sold and operated in the State towards the target of 100 percent of the fleet transitioning to zero-emission vehicles by 2045 everywhere feasible and for all drayage trucks to be zero-emission by 2035.

    c) Strategies, in coordination with other State agencies, U.S. Environmental Protection Agency and local air districts, to achieve 100 percent zero-emission from off-road vehicles and equipment operations in the State by 2035.

    In implementing this Paragraph, the State Air Resources Board shall act consistently with technological feasibility and cost-effectiveness.

3. The Governor's Office of Business and Economic Development, in consultation with the State Air Resources Board, Energy Commission, Public Utilities Commission, State Transportation Agency, the

Department of Finance and other State agencies, local agencies and the private sector, shall develop a Zero-Emissions Vehicle Market Development Strategy by January 31, 2021, and update every three years thereafter, that:

a) Ensures coordinated and expeditious implementation of the system of policies, programs and regulations necessary to achieve the goals and orders established by this Order.

b) Outlines State agencies' actions to support new and used zero-emission vehicle markets for broad accessibility for all Californians.

4. The State Air Resources Board, the Energy Commission, Public Utilities Commission and other relevant State agencies, shall use existing authorities to accelerate deployment of affordable fueling and charging options for zero-emission vehicles, in ways that serve all communities and in particular low-income and disadvantaged communities, consistent with State and federal law.

5. The Energy Commission, in consultation with the State Air Resources Board and the Public Utilities Commission, shall update the biennial statewide assessment of zero-emission vehicle infrastructure required by Assembly Bill 2127 (Chapter 365, Statues of 2018) to support the levels of electric vehicle adoption required by this Order.

6. The State Transportation Agency, the Department of Transportation and the California Transportation Commission, in consultation with the Department of Finance and other State agencies, shall by July 15, 2021 identify near term actions, and investment strategies, to improve clean transportation, sustainable freight and transit options, while continuing a "fix-it-first" approach to our transportation system, including where feasible:

a) Building towards an integrated, statewide rail and transit network, consistent with the California State Rail Plan, to provide seamless, affordable multimodal travel options for all.

b) Supporting bicycle, pedestrian, and micro-mobility options, particularly in low-income and disadvantaged communities in the State, by incorporating safe and accessible infrastructure into projects where appropriate.

c) Supporting light, medium, and heavy duty zero-emission vehicles and infrastructure as part of larger transportation projects, where appropriate.

7. The Labor and Workforce Development Agency and the Office of Planning and Research, in consultation with the Department of Finance and other State agencies, shall develop by July 15, 2021 and expeditiously implement a Just Transition Roadmap, consistent with the recommendations in the "Putting California on the High Road: A Jobs and Climate Action Plan for 2030" report pursuant to Assembly Bill 398 (Chapter 135, Statutes of 2017).

8. To support the transition away from fossil fuels consistent with the goals established in this Order and California's goal to achieve carbon neutrality by no later than 2045, the California Environmental Protection Agency and the California Natural Resources Agency, in consultation with other State, local and federal agencies, shall expedite regulatory processes to repurpose and transition upstream and downstream oil production facilities, while supporting community participation, labor standards, and protection of public health, safety and the environment. The agencies shall report on progress and provide an action plan, including necessary changes in regulations, laws or resources, by July 15, 2021.

9. The State Air Resources Board, in consultation with other State agencies, shall develop and propose strategies to continue the State's current efforts to reduce the carbon intensity of fuels beyond 2030 with consideration of the full life cycle of carbon.

10. The California Environmental Protection Agency and the California Natural Resources Agency, in consultation with the Office of Planning and Research, the Department of Finance, the Governor's Office of Business and Economic Development and other local and federal agencies, shall develop strategies, recommendations and actions by July 15, 2021 to manage and expedite the responsible closure and remediation of former oil extraction sites as the State transitions to a carbon-neutral economy.

11. The Department of Conservation's Geologic Energy Management Division and other relevant State agencies shall strictly enforce bonding requirements and other regulations to ensure oil extraction operators are responsible for the proper closure and remediation of their sites.

12. The Department of Conservation's Geologic Energy Management Division shall:

    a) Propose a significantly strengthened, stringent, science-based health and safety draft rule that protects communities and workers from the impacts of oil extraction activities by December 31, 2020.

    b) Post on its website for public review and consultation a draft rule at least 60 days before submitting to the Office of Administrative Law.

IT IS FURTHER ORDERED that as soon as hereafter possible, the Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 23rd day of September 2020.

_____

GAVIN NEWSOM
Governor of California

ATTEST:

_____

ALEX PADILLA
Secretary of State

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

OPERATIONAL MATTERS
ITEM 9: WATER SYSTEM UPDATES

The following is a brief report of the water system for **September 2020**.

Projects and Repairs

1. Water Operations staff flushed 70 hydrants in the Robinson Ranch Community and Canyon Community.
2. Water Operations staff replaced one hydrant on Robinson Ranch Road in the Robinson Ranch Community.
3. Water Operations staff made multiple repairs on a water main located on Silvertree Lane in the Trabuco Highlands Community.

Monthly Water System Operations Summary

The Monthly Water System Operations Summary is attached for the Committee's review. Any anomalies will be presented at the time of the Engineering/Operational Committee Meeting.

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

EXHIBITS

1. Monthly Water System Operations Summary

CONTACTS (staff responsible): PALUDI/KESSLER

TRABUCO CANYON WATER DISTRICT
MONTHLY WATER SYSTEM OPERATIONS SUMMARY

2020													
DIMENSION WTP													
	JAN	**FEB**	**MARCH**	**APRIL**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	***TOTAL***
SAC METER AC/FT	152	166	128	68	147	13	Offline						674
BACKWASH AC/FT	5	4	4.0	3	5	1	0	3					25
FLUSHWATER AC/FT	9	9	9.0	5	9	2	0	9					52
WTP EFFLUENT AC/FT	153	168	128	68	151	10	0	199					877
81													
TRABUCO CREEK GWTF	0	0	0	68	81	58	59	25					291
US WELL AC/FT	0	0	0	0	0	0	0	0					0
AMP WATER													
SMWD AC/FT	0	0	0	0	0	36	10	4					50
IRWD AC/FT	0	0	0	0	0	111	122	24					257
TOTAL SUPPLY													
AC/FT	153	168	128	136	232	197	191	252					1,457
CFS DAILY AVERAGE	2.4	2.9	2.1	2.3	3.8	3.3	3.1	4.0					3.0
AC/FT PER DAY	4.9	5.8	4.1	4.5	7.5	6.6	6.2	8.1					6.0
OPERATIONS in GAL.													
WTP DOMESTIC	28,424	26,778	32,688	18,700	37,176	3,740	75	59,242					206,823
WWTP DOM	6,000	20,570	14,630	11,110	27,170	22,800	23,430	17,710					143,420
OPERATIONS (AF)													
SUPPLEMENT TO RW	0	0	0	0	0	0	0	0					0
LOSSES in GAL.													
FLUSHING (gal.)	144,000	468,000	0	0	0	0	384,000	198,000					1,194,000
SEWER CLEANING (gal.)	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000					40,000
LINE BREAKS (gal.)	1,000	350,000	350,000	30,000	5,000	1,000	0	1,000					738,000
SYSTEM DEMAND **													
CFS DAILY AVERAGE	2.4	2.9	2.0	2.2	3.7	3.3	3.1	4.0					3.0
AC/FT PER DAY	4.9	5.7	4.1	4.5	7.4	6.6	6.2	8.1					5.9
RESERVOIR STORAGE													
MONTHLY AVG (MG)	8.8	8.6	8.8	8.9	8.6	8.8	8.5	8.2					9
DAYS OF STORAGE	4	3	4	4	3	4	3	3					4
ZONES (AF)													
RIDGELINE PS	Offline	Offline	Offline	Offline	20	10	122	199					351
EL TORO P.S.	153	168	128	68	131	111	122	24					905
TOPANGA	3	2	2	1	3	3	4	4					22
FALCON	0.5	0.6	0.2	0.2	0.7	0.7	0.8	0.8					5
ROSE PRV/ OAKS	3	3	3	5	6	6	7	7					40
CANYON CREEK	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.6					3
ROSE P.S.	0.2	0.1	1.5	0.3	1.5	0.8	0.8	1.4					7
ROBINSON RANCH	26	30	19	24	49	47	56	73					324
DOVE CANYON	60	63	51	39	87	91	97	99					587
PORTOLA HILLS	8	11	9	8	11	13	16	15					91
* Usage estimated new meter installed					** Excludes Operational use, losses, and supplement to Recycled Water Reservoir (RW)								

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

OPERATIONAL MATTERS
ITEM 10: WASTEWATER SYSTEM UPDATES

The following is a brief report of the wastewater system for **September 2020.**

Projects and Repairs

1. Wastewater Operations staff completed the annual methods proficiency testing for the renewal of State Laboratory Certification.
2. Wastewater Operations staff completed the Dove/Robinson Ranch seven-day testing period.
3. Wastewater Operations staff drained and cleaned the West Sequencing Batch Reactor (SBR) at the Robinson Ranch Wastewater Treatment Plant (WWTP) in order to complete repairs to the aeration system.
4. Wastewater Operations staff assisted Vaughan Industries on the installation of the West SBR Jet Pump System valves.

Sewer System Management Plan (SSMP) Report

1. *SSMP Communication Program*: The purpose of the program is to communicate on a regular basis with the public on the development, implementation, and performance of TCWD's SSMP. Status updates on the work and type of work performed on the sewer system will be provided, including sewer line and manhole cleaning, system repairs, lift station cleaning, and updates from satellite facilities:

- Sewer System – Cleaned **6,157** feet of gravity sewer line
- Satellite and Contract Facilities:
  - The Oaks at Trabuco Wet Well was pumped out **9** times.
  - O'Neill Park Sewer System (Gravity Sewer, Lift Station, and Force Main)
    - Status: Ok | Repairs: None
- Sewer System Quarterly Report:
  - Next Scheduled Report – **January 2021**

2. *SSMP Program Audits*: Periodic internal audits shall be conducted, at a minimum every two years, with reports kept on file. The audit shall focus on evaluating the effectiveness of the SSMP and TCWD's compliance with the mandatory elements of TCWD's SSMP:

- Next scheduled Report Due: **January 2021**

Monthly Recycled Water System Operations Summary

The Monthly Recycled Water System Operations Summary is attached for the Committee's review. Any anomalies will be presented at the time of the Engineering/Operational Committee Meeting.

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

EXHIBITS

1. Monthly Recycled Water System Operations Summary
2. Sewer System Management Plan Quarterly Report – Third Quarter 2020

CONTACTS (staff responsible): PALUDI/PEREA

TRABUCO CANYON WATER DISTRICT | NON-DOMESTIC WATER SYSTEM SUMMARY - 2020

RECYCLED WATER SUPPLY	MAX	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	TOTAL	FIVE YEAR AVG
WWTP Reclaimed Water Production, AF	78.3	50.4	45.4	38.4	35.7	58.6	50.7	51.0	50.5	41.9				422.5	550.04
Reclaimed Reservoir Level, FT	1274.5	1,270.5	1,272.0	1,274.1	1,270.8	1,266.5	1,269.5	1,267.0	1,266.5	1,260.0				-	-
Reclaimed Reservoir Free Board, FT	25.5	4.0	2.5	0.4	3.7	8.0	5.0	7.5	8.0	14.5				-	-
Reclaimed Reservoir Storage, AF	145.5	122.8	128.6	139.9	125.2	99.6	117.4	102.7	99.6	69.6				-	-
Supplemental Domestic Water Added, AF	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	72.88

RECYCLED WATER SYSTEM DEMAND															
NON DOMESTIC WATER USER	ALLOC. AF	8% JAN	17% FEB	25% MAR	33% APR	42% MAY	50% JUN	58% JUL	67% AUG	75% SEP	83% OCT	92% NOV	100% DEC	TOTAL	ALLOC. %
Dahlia Court	8.2	0.3	0.3	0.1	0.3	0.6	0.3	0.3	0.2	0.2				2.6	32%
Dove Canyon Golf Course	106.7	3.8	10.4	2.5	9.4	40.5	36.7	55.6	42.6	39.1				240.6	226%
Dove Canyon Master Association	279.3	3.6	7.2	2.5	4.7	23.3	21.1	27.4	24.5	29.4				143.8	51%
Robinson Ranch	80.2	0.4	1.5	0.4	0.7	3.1	3.0	4.5	3.8	4.7				22.1	28%
Trabuco Highlands	159.7	1.7	4.0	1.5	1.8	10.0	8.6	11.6	9.0	9.5				57.8	36%
City of RSM	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01				0.0	8%
Construction Water	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	N/A
Sakaida Nursery	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0%
SMWD	N/A	18.3	3.2	16.4	0.0	0.0	0.0	0.0	0.0	0.0				37.9	N/A
TY Nursery	17.9	0.0	0.0	0.0	0.0	0.0	5.3	12.0	0.0	0.0				17.3	97%
TOTAL, AF	**653.2**	**28.1**	**26.7**	**23.4**	**16.9**	**77.5**	**75.0**	**111.5**	**80.1**	**83.0**				**522.1**	**80%**
PERCENTAGE OF NDW ALLOCATION/YEAR		**4%**	**8%**	**12%**	**15%**	**26%**	**38%**	**55%**	**67%**	**80%**					
TOTAL ANNUAL AVG. NDW AVAILABLE**	**774.36**														

URBAN RUNOFF CAPTURE AND REUSE															
DISTRICT FACILITY		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	FIVE YEAR AVG
Shadow Rock Detention Basin Production		0.0	0.0	0.0	0.0	0.0	1.6	1.2	1.1	0.9				4.8	21.2
Dove | Tick Creek Production*	*Dry Season*	0.0	0.0	0.0	0.0	0.0	1.9	5.1	3.0	6.3				16.3	102.7
	TCWD Portion	0.0	0.0	0.0	0.0	0.0	1.0	2.5	1.5	3.2				8.1	-
	SMWD Portion	0.0	0.0	0.0	0.0	0.0	1.0	2.5	1.5	3.2				8.1	-
Dove Lake Water Pumped		0.0	0.0	0.0	0.0	0.0	49.7	49.7	49.7	14.9				164.0	201.7
Dove Lake Free Board, Ft		0.0	0.0	0.0	0.0	0.0	3.0	5.0	8.5	9.0				-	-
Dove Lake Storage		180.0	180.0	180.0	180.0	180.0	160.0	147.0	88.0	79.0				-	-
Total Rainfall, In.		0.2	0.4	3.4	4.9	0.0	0.0	0.0	0.0	0.0				8.8	14.5

**** SMWD share of Dove/Tick Pump Station Dry Season Water is 50% of production.***

***** Based on 5-Year Average Reclaimed Water Reservoir Base Supply & Recycled Water Production***

TRABUCO CANYON WATER DISTRICT
SSMP QUARTERLY REPORT

Quarterly report for July thru September 2020

Report Date: October 1, 2020

Completed By: Travis Jones

District Sub-Section	Santiago/Portola Hills			Dove Canyon			Rancho Cielo/Walden			Robinson Ranch/Trabuco Highlands		
	Total Amount	Amount Completed	Percentage Completed	Total Amount	Amount Completed	Percentage Completed	Total Amount	Amount Completed	Percentage Completed	Total Amount	Amount Completed	Percentage Completed
Sewer Line Cleaned, Feet	44625	44625	100%	64135	64135	100%	29865	5264	18%	59170	0	0%
Manholes, Inspected/Cleaned	205	205	100%	212	212	0%	124	20	16%	236	0	0%
Manholes Needing Repair	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Wet Wells, Inspected/Cleaned	2	0	0%	3	3	100%	1	1	100%	2	0	0%
Lift Stations, Inspected/Maintained	2	2	100%	3	3	100%	1	1	100%	2	2	100%
Grease Interceptors Inspected	1	1	100%	5	5	100%	5	5	100%	n/a	n/a	n/a

Note: All Sewage Lift stations are inspected 3-4 times a week

Additional Work: Replaced # 2 starter at Heritage Lift Station
Pulled # 1 pump at Heritage Lift Station for repair

Contract Services	Oneill Park/OCFA		
	Total Amount	Amount Completed	Percent completed
Sewer Line Cleaned, Feet	12700	12700	100%
Manholes, Inspected/Cleaned	95	95	100%
Manholes Needing Repair	0	0	0%
Wet Wells, Inspected/Cleaned	1	1	100%
Lift Stations, Inspected/Maintained	1	1	100%
Grease Interceptors Inspected	0	0	0%

TRABUCO CANYON WATER DISTRICT
ENGINEERING/OPERATIONAL COMMITTEE MEETING | OCTOBER 7, 2020

OPERATIONAL MATTERS
ITEM 11: MAINTENANCE DEPARTMENT UPDATES

The following is a brief report of the wastewater system for **September 2020.**

Projects and Repairs

1. Maintenance Department staff worked with Hydrotech Electrical on the installation of the Belt Press Building Motor Control Center (MCC) Panel.
2. Maintenance Department staff worked with Vaughan Industries on the installation of the West SBR Jet Pump System valves.
3. Maintenance Department staff worked with Hydrotech Electrical on the installation of new LED overhead lighting for the WWTP Maintenance Building and Plano Trabuco Sewer Lift Station.
4. Maintenance Department staff worked with Flo-Services on the installation of high flow pump at Topanga Booster Pump Station.
5. Maintenance Department staff coordinated the delivery of vehicles approved for disposal with Ritchie Brothers Auction Services.
6. Maintenance Department staff received and prepared the new Ford F650 Dump Truck for service.

RECOMMENDED ACTION:

Committee to receive system status updates. No action required.

EXHIBITS

None

CONTACTS (staff responsible): PALUDI/STROUD

TRABUCO CANYON WATER DISTRICT
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REGULATORY AND OTHER MATTERS
ITEM 12: OTHER MATTERS/REPORTS

Other Matters/Reports from the General Manager and/or District staff may be provided at the time of the Engineering/Operational Committee Meeting.

RECOMMENDED ACTION:
Hear Other Matters/Reports that may have arisen after the posting of the agenda.

EXHIBITS
None

CONTACTS (staff responsible): PALUDI