COASTSIDE COUNTY WATER DISTRICT

766 MAIN STREET

HALF MOON BAY, CA 94019

REGULAR MEETING OF THE BOARD OF DIRECTORS

Tuesday, November 9, 2021 - 7:00 p.m.

AGENDA

Due to the Covid-19 pandemic, and in accordance with Assembly Bill 361, which modifies California Government Code Section 54953, the Boardroom will not be open to the public for the November 9, 2021, Regular Meeting of the Board of Directors of the Coastside County Water District. This meeting will be conducted remotely via teleconference only.

The Public may watch and/or participate in the public meeting by joining the meeting through the Zoom Videoconference link provided below. The public may also join the meeting by calling the below listed teleconference phone number.

How to Join Online or by Phone

The meeting will begin at 7:00 p.m.

Whether you participate online or by telephone, you may wish to "arrive" early so that staff can address any technology questions prior to the start of the meeting.

ONLINE:

Join Zoom Meeting
https://zoom.us/j/93778260596?pwd=aEpRcFlnaHdQM21PSEJQWjNiN09TQT09

Meeting ID: 937 7826 0596
Passcode: 184355

One tap mobile
+16699006833,,93778260596#,,,,,,0#,,184355# US (San Jose)

Dial by your location
+1 669 900 6833 US (San Jose)

Meeting ID: 937 7826 0596
Passcode: 184355

Find your local number: https://zoom.us/u/adZt3d9LjB

Procedures to make a public comment with Zoom Video/Conference – As a reminder, all participants except the Board Members and Staff are muted on entry.

- ***From a computer:*** *(1) Using the Zoom App. at the bottom of your screen, click on "Participants" and then "Raise Hand". Participants will be called to comment in the order in which they are received. Begin by stating your name and place of residence.*

  OR

- *(2) Using the Zoom App, at the bottom of your screen click on "Chat" and then type that you wish to make a comment into the Chat Box. Ensure that the "To:" field is populated by either "Everyone" or "the Moderator". Begin by stating your name and place of residence.*

- ***From a phone:*** *Using your keypad, dial *9, and this will notify the Moderator that you have raised your hand. Begin by stating your name and place of residence. The Moderator will call on you by stating the last 4 digits of your phone number. If you wish to block your phone number dial *67 prior to dialing in. If your phone number is not displayed, the Moderator will call you by Caller number.*

The Coastside County Water District (CCWD) does not discriminate against persons with disabilities. Upon request, the agenda and agenda packet materials can be provided in a format to accommodate special needs. If you require a copy of the agenda or related materials in an alternative format to accommodate a disability, or if you wish to attend this public meeting and will require special assistance or other special equipment, please call the District at (650) 726-4405 in advance and we will make every reasonable attempt to provide such an accommodation.

All public records relating to an open session item on this agenda, which are not exempt from disclosure pursuant to the California Public Records Act, that are distributed to a majority of the legislative body will be available for public inspection at the CCWD District Office, located at 766 Main Street, Half Moon Bay, CA at the same time that the public records are distributed or made available to the legislative body.

This agenda and accompanying materials can be viewed on Coastside County Water District's website located at: www.coastsidewater.org.

The Board of the Coastside County Water District reserves the right to take action on any item included on this agenda.

1) ROLL CALL

2) PLEDGE OF ALLEGIANCE

3) PUBLIC COMMENT

At this time members of the public may address the Board of Directors on issues not listed on the agenda which are within the purview of the Coastside County Water District. Comments on matters that are listed on the agenda may be made at the time the Board is considering each item. Each speaker is allowed a maximum of three (3) minutes and must complete and submit a speaker slip. The President of the Board will recognize each speaker, at which time the speaker should proceed to the podium, give their name and address and provide their comments to the Board.

4) CONSENT CALENDAR

The following matters before the Board of Directors are recommended for action as stated by the General Manager. All matters listed hereunder constitute a Consent Calendar, are considered as routine by the Board of Directors, and will be acted upon by a single vote of the Board. There will be no separate discussion of these items unless a member of the Board so requests, in which event the matter shall be removed from the Consent Calendar and considered as a separate item.

A. Approval of disbursements for the month ending October 31, 2021:
Claims: $1,625,437.98; Payroll: $264,183.35 for a total of $1,889,621.33 (attachment)
- *October 2021 Monthly Financial Claims reviewed by and approved by President Reynolds*

B. Acceptance of Financial Reports (attachment)

C. Approval of Minutes of October 12, 2021, Regular Board of Directors Meeting (attachment)

D. Installed Water Connection Capacity and Water Meters Report (attachment)

E. Total CCWD Production Report (attachment)

F. CCWD Monthly Sales by Category Report-October 2021 (attachment)

G. Monthly Planned Plant or Tank Discharge and New Water Line Flushing Report (attachment)

H. Monthly Rainfall Reports (attachment)

I. Acceptance of Non-Complex Pipeline Extension Project – 477 3rd Avenue – Rita & Stephen Semprevivo (attachment)

J. SFPUC Hydrological Report for September 2021 (attachment)

5) MEETINGS ATTENDED / DIRECTOR COMMENTS

6) GENERAL BUSINESS

A. Water Line Replacement Under Pilarcitos Creek at Strawflower Village Project – Adoption of the Initial Study/Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program (attachment)

B. Consider and Reaffirm Resolution 2021-06 "Making Findings Pursuant to Assembly Bill 361 That the Proclaimed State of Emergency Continues to Impact the Ability to Meet Safely In Person." (attachment)

C. Water Shortage Advisory and Public Outreach Update (attachment)

D. 1) Review Draft Water Shortage Contingency Stage Rate Study and Proposed Amendment to the District's Rate and Fee Schedule to Add Water Shortage Contingency Stage Rates Consistent with the 2020 Water Shortage Contingency Plan and SFPUC Pass-through Wholesale Water Shortage Rates or Surcharges; and 2) Schedule a Public Hearing on Proposed Amendment to the District's Rate and Fee Schedule to Add Water Shortage Rates or Surcharges and Authorize Issuance of a Notice of Public Hearing (attachment)

E. Consider Approval of Resolution 2021-08 Declaring Intention to Reimburse Expenditures From the Proceeds of Tax-Exempt Obligations (attachment)

F. Award of Contract for Installation of Energy Efficient LED Light Fixtures at Crystal Spring Pump Station, Nunes and Denniston Facilities using PG&E On-Bill Financing (attachment)

G. Nunes Water Treatment Plant Upgrades Project Update #3 (attachment)

7) MONTHLY INFORMATIONAL REPORTS

A. General Manager's Report (attachment)
B. Superintendent of Operations Report (attachment)

8) DIRECTOR AGENDA ITEMS – REQUESTS FOR FUTURE BOARD MEETINGS

9) ADJOURNMENT

COASTSIDE COUNTY WATER DISTRICT
CLAIMS FOR OCTOBER 2021

CHECKS				
CHECK DATE	**CHECK NO.**	**VENDOR**		**AMOUNT**
10/08/2021	29979	ADP, INC.	$	722.00
10/08/2021	29980	CATHLEEN BRENNAN	$	531.57
10/08/2021	29981	COMCAST	$	256.82
10/08/2021	29982	JAMES COZZOLINO, TRUSTEE	$	200.00
10/08/2021	29983	SEAN DONOVAN	$	130.78
10/08/2021	29984	FEDAK & BROWN LLP	$	5,950.00
10/08/2021	29985	GEO BLUE CONSULTING, INC.	$	13,056.25
10/08/2021	29986	HASSETT HARDWARE	$	1,378.78
10/08/2021	29987	HDR ENGINEERING, INC	$	11,114.88
10/08/2021	29988	HUE & CRY, INC.	$	24.00
10/08/2021	29989	MASS MUTUAL FINANCIAL GROUP	$	1,829.19
10/08/2021	29990	OCCUPATIONAL HEALTH CENTERS OF CALIFORNIA, A MEDICAL CORP.	$	241.50
10/08/2021	29991	PACIFICA COMMUNITY TV	$	300.00
10/08/2021	29992	REPUBLIC SERVICES	$	571.76
10/08/2021	29993	ROGUE WEB WORKS, LLC	$	780.00
10/08/2021	29994	SM CTY ENVIRONMENTAL HEALTH	$	2,070.00
10/08/2021	29995	STANDARD INSURANCE COMPANY	$	558.89
10/08/2021	29996	TPX COMMUNICATIONS	$	2,144.63
10/08/2021	29997	VALIC	$	5,080.00
10/08/2021	29998	US BANK NA	$	2,088.36
10/20/2021	29999	HEALTH BENEFITS ACWA-JPIA	$	45,824.10
10/20/2021	30000	ASSOC. CALIF. WATER AGENCY	$	11,077.68
10/20/2021	30001	AT&T MOBILTY	$	792.85
10/20/2021	30002	MICHAEL DE MEO	$	1,206.57
10/20/2021	30003	MARK & MARI FOWLER	$	12,426.91
10/20/2021	30004	GOLDEN GATE SIGN COMPANY, INC.	$	10,285.23
10/20/2021	30005	HERC RENTALS, INC.	$	2,471.71
10/20/2021	30006	ICONIX WATERWORKS (US) INC.	$	18,339.67
10/20/2021	30007	JESSE MACK COMPANY INC.	$	105,215.63
10/20/2021	30008	MASS MUTUAL FINANCIAL GROUP	$	1,829.19
10/20/2021	30009	MERCHANTS BANK OF COMMERCE	$	64,300.00
10/20/2021	30010	PACIFIC GAS & ELECTRIC CO.	$	60,090.80
10/20/2021	30011	PACIFIC GAS & ELECTRIC CO.	$	73.53
10/20/2021	30012	RANGER PIPELINES, INC.	$	578,700.00
10/20/2021	30013	SAN FRANCISCO WATER DEPT.	$	248,713.82
10/20/2021	30014	TRI COUNTIES BANK	$	5,609.30
10/20/2021	30015	VALIC	$	5,080.00
10/20/2021	30016	WATEREUSE	$	892.50
10/28/2021	30017	ANDREINI BROS. INC.	$	107,332.58
10/28/2021	30018	ASSOC.CALIF.WATER AGENCIES	$	19,225.00
10/28/2021	30019	AT&T	$	133.00
10/28/2021	30020	AT&T	$	698.93
10/28/2021	30021	BADGER METER, INC.	$	66.00
10/28/2021	30022	BALANCE HYDROLOGICS, INC	$	5,410.89
10/28/2021	30023	BAY AREA WATER SUPPLY &	$	8,571.00
10/28/2021	30024	BAY ALARM COMPANY	$	649.59
10/28/2021	30025	BFI OF CALIFORNIA, INC.	$	24,945.95
10/28/2021	30026	BIG CREEK LUMBER	$	177.01
10/28/2021	30027	CALIFORNIA GENERATOR SERVICE	$	3,631.61
10/28/2021	30028	CALCON SYSTEMS, INC.	$	7,628.59
10/28/2021	30029	CHEMTRADE CHEMICALS US LLC	$	2,567.52
10/28/2021	30030	PETTY CASH	$	113.44
10/28/2021	30031	CORE & MAIN LP	$	2,459.02
10/28/2021	30032	DATAPROSE, LLC	$	3,857.03
10/28/2021	30033	DE LAGE LANDEN FINANCIAL SERVICES, INC.	$	920.84
10/28/2021	30034	EKI INC.	$	21,394.36
10/28/2021	30035	CASTANEDA & PEREZ INC	$	1,257.82

10/28/2021	30036	FREYER & LAURETA, INC.	$	21,997.50
10/28/2021	30037	GEO BLUE CONSULTING, INC.	$	9,000.00
10/28/2021	30038	GRAINGER, INC.	$	522.12
10/28/2021	30039	HACH CO., INC.	$	1,168.50
10/28/2021	30040	HMB BLDG. & GARDEN INC.	$	521.40
10/28/2021	30041	HANSONBRIDGETT. LLP	$	11,783.00
10/28/2021	30042	HDR ENGINEERING, INC	$	24,665.49
10/28/2021	30043	INTEGRATED ID SYSTEMS, INC	$	25.52
10/28/2021	30044	IRON MOUNTAIN	$	1,107.31
10/28/2021	30045	IRVINE CONSULTING SERVICES, INC.	$	8,639.78
10/28/2021	30046	DUSTIN JAHNS	$	195.00
10/28/2021	30047	LAUNCH! CONSULTING, INC.	$	20,180.00
10/28/2021	30048	LIEBERT CASSIDY WHITMORE	$	87.00
10/28/2021	30049	GLENNA LOMBARDI	$	91.00
10/28/2021	30050	MASS MUTUAL FINANCIAL GROUP	$	1,829.19
10/28/2021	30051	MISSION UNIFORM SERVICES INC.	$	173.60
10/28/2021	30052	MONTEREY BAY ANALYTICAL SERVICES, INC.	$	647.00
10/28/2021	30053	MTA PARTS, INC.	$	29.49
10/28/2021	30054	OFFICE DEPOT	$	1,463.53
10/28/2021	30055	ACI PAYMENTS, INC.	$	150.00
10/28/2021	30056	PAPE MACHINERY EXCHANGE	$	1,885.43
10/28/2021	30057	PASTORINO HAY & RANCH SUPPLY, INC.	$	850.31
10/28/2021	30058	PAULO'S AUTO CARE	$	1,085.32
10/28/2021	30059	RAFTELIS FINANCIAL CONSULTANTS, INC.	$	3,581.25
10/28/2021	30060	RAY A MORGAN COMPANY INC.	$	917.66
10/28/2021	30061	SAN MATEO CTY PUBLIC HEALTH LAB	$	1,260.00
10/28/2021	30062	TEAMSTERS LOCAL UNION #856	$	1,356.00
10/28/2021	30063	JAMES TETER	$	480.00
10/28/2021	30064	TYLER TECHNOLOGIES, INC	$	4,084.20
10/28/2021	30065	UNIVAR SOLUTIONS USA INC.	$	3,368.75
10/28/2021	30066	VALIC	$	5,080.00
10/28/2021	30067	VERIZON WIRELESS	$	2,281.34
10/28/2021	30068	WEST YOST ASSOCIATES, INC	$	774.25
10/28/2021	30069	JUAN CARLOS SALAZAR	$	3,360.00
10/28/2021	30070	JOHN KROLL	$	2,879.23
10/28/2021	30071	DEVANEY ENGINEERING, INC.	$	784.35
10/28/2021	30072	DANIEL DUPLESSIS	$	13.75
10/28/2021	30073	GOLDEN BAY CONSTRUCTION, INC.	$	936.67
10/28/2021	30074	PG&E	$	845.09
		SUBTOTAL CLAIMS FOR MONTH	$	1,573,099.11

WIRE PAYMENTS

10/01/2021	DFT0000375	PUB. EMP. RETIRE SYSTEM	$	14,752.77
10/15/2021	DFT0000378	PUB. EMP. RETIRE SYSTEM	$	14,833.14
10/29/2021	DFT0000379	PUB. EMP. RETIRE SYSTEM	$	14,120.12
10/31/2021		BANK AND CREDIT CARD FEES	$	8,632.84
		SUBTOTAL WIRE PAYMENTS FOR MONTH	$	52,338.87

TOTAL CLAIMS FOR THE MONTH	**$**	**1,625,437.98**

Coastside County Water District

Monthly Budget Report

Account Summary

For Fiscal: 2021-2022 Period Ending: 10/31/2021

		October Budget	October Activity	Variance Favorable (Unfavorable)	Percent Variance	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Percent Variance	Total Budget
Revenue										
RevType: 1 - Operating										
1-4120-00	Water Revenue	1,261,707.00	1,130,933.75	-130,773.25	-10.36 %	5,031,255.00	5,069,267.01	38,012.01	0.76 %	13,387,000.00
	Total RevType: 1 - Operating:	**1,261,707.00**	**1,130,933.75**	**-130,773.25**	**-10.36 %**	**5,031,255.00**	**5,069,267.01**	**38,012.01**	**0.76 %**	**13,387,000.00**
RevType: 2 - Non-Operating										
1-4170-00	Water Taken From Hydrants	4,333.00	6,551.65	2,218.65	51.20 %	17,332.00	26,624.66	9,292.66	53.62 %	52,000.00
1-4180-00	Late Notice - 10% Penalty	5,000.00	0.00	-5,000.00	-100.00 %	5,000.00	0.00	-5,000.00	-100.00 %	50,000.00
1-4230-00	Service Connections	833.00	1,512.02	679.02	81.52 %	3,333.00	5,046.19	1,713.19	51.40 %	10,000.00
1-4920-00	Interest Earned	4,687.00	609.46	-4,077.54	-87.00 %	18,750.00	4,209.96	-14,540.04	-77.55 %	56,250.00
1-4930-00	Tax Apportionments/County Checks	0.00	736.01	736.01	0.00 %	0.00	1,183.62	1,183.62	0.00 %	780,000.00
1-4950-00	Miscellaneous Income	0.00	0.00	0.00	0.00 %	1,750.00	19,038.69	17,288.69	987.93 %	7,000.00
1-4955-00	Cell Site Lease Income	15,300.00	15,723.67	423.67	2.77 %	61,200.00	62,399.62	1,199.62	1.96 %	184,000.00
1-4965-00	ERAF Refund - County Taxes	0.00	0.00	0.00	0.00 %	175,000.00	359,746.81	184,746.81	105.57 %	400,000.00
	Total RevType: 2 - Non-Operating:	**30,153.00**	**25,132.81**	**-5,020.19**	**-16.65 %**	**282,365.00**	**478,249.55**	**195,884.55**	**69.37 %**	**1,539,250.00**
	Total Revenue:	**1,291,860.00**	**1,156,066.56**	**-135,793.44**	**-10.51 %**	**5,313,620.00**	**5,547,516.56**	**233,896.56**	**4.40 %**	**14,926,250.00**
Expense										
ExpType: 1 - Operating										
1-5130-00	Water Purchased	312,135.00	258,953.82	53,181.18	17.04 %	1,373,540.00	1,256,374.67	117,165.33	8.53 %	2,321,721.00
1-5230-00	Nunes T P Pump Expense	4,000.00	4,112.96	-112.96	-2.82 %	16,000.00	17,700.05	-1,700.05	-10.63 %	44,800.00
1-5231-00	CSP Pump Station Pump Expense	40,000.00	45,524.68	-5,524.68	-13.81 %	209,000.00	212,699.84	-3,699.84	-1.77 %	342,000.00
1-5232-00	Other Trans. & Dist Pump Expense	2,500.00	1,872.80	627.20	25.09 %	10,300.00	7,974.87	2,325.13	22.57 %	23,000.00
1-5233-00	Pilarcitos Canyon Pump Expense	700.00	669.52	30.48	4.35 %	2,800.00	2,088.85	711.15	25.40 %	36,000.00
1-5234-00	Denniston T P Pump Expense	1,000.00	911.87	88.13	8.81 %	4,000.00	3,851.77	148.23	3.71 %	64,000.00
1-5242-00	CSP Pump Station Operations	1,600.00	286.91	1,313.09	82.07 %	6,400.00	2,071.03	4,328.97	67.64 %	17,000.00
1-5243-00	CSP Pump Station Maintenance	3,400.00	1,249.16	2,150.84	63.26 %	13,200.00	2,912.45	10,287.55	77.94 %	38,000.00
1-5246-00	Nunes T P Operations - General	7,500.00	6,526.72	973.28	12.98 %	31,500.00	26,188.83	5,311.17	16.86 %	92,500.00
1-5247-00	Nunes T P Maintenance	10,700.00	2,989.19	7,710.81	72.06 %	42,800.00	23,735.81	19,064.19	44.54 %	128,400.00
1-5248-00	Denniston T P Operations-General	5,000.00	789.99	4,210.01	84.20 %	14,000.00	2,153.29	11,846.71	84.62 %	56,500.00
1-5249-00	Denniston T.P. Maintenance	44,600.00	60,586.73	-15,986.73	-35.84 %	74,600.00	82,749.02	-8,149.02	-10.92 %	135,600.00
1-5250-00	Laboratory Expenses	8,000.00	4,951.00	3,049.00	38.11 %	25,250.00	17,710.92	7,539.08	29.86 %	77,000.00
1-5260-00	Maintenance - General	30,000.00	49,783.39	-19,783.39	-65.94 %	120,000.00	172,150.93	-52,150.93	-43.46 %	358,000.00
1-5261-00	Maintenance - Well Fields	10,000.00	0.00	10,000.00	100.00 %	13,800.00	0.00	13,800.00	100.00 %	30,800.00
1-5263-00	Uniforms	0.00	0.00	0.00	0.00 %	9,300.00	311.44	8,988.56	96.65 %	10,300.00
1-5318-00	Studies/Surveys/Consulting	10,000.00	40,041.25	-30,041.25	-300.41 %	40,000.00	79,409.55	-39,409.55	-98.52 %	154,000.00
1-5321-00	Water Resources	2,200.00	0.00	2,200.00	100.00 %	9,100.00	0.00	9,100.00	100.00 %	26,700.00

		October Budget	October Activity	Variance Favorable (Unfavorable)	Percent Variance	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Percent Variance	Total Budget
1-5322-00	Community Outreach	5,000.00	300.00	4,700.00	94.00 %	29,000.00	900.00	28,100.00	96.90 %	60,000.00
1-5325-00	Water Shortage Program	0.00	1,275.00	-1,275.00	0.00 %	0.00	6,022.68	-6,022.68	0.00 %	0.00
1-5381-00	Legal	8,333.00	11,056.00	-2,723.00	-32.68 %	33,332.00	29,980.00	3,352.00	10.06 %	100,000.00
1-5382-00	Engineering	5,650.00	3,034.80	2,615.20	46.29 %	22,600.00	16,203.05	6,396.95	28.31 %	67,800.00
1-5383-00	Financial Services	0.00	0.00	0.00	0.00 %	8,000.00	9,075.00	-1,075.00	-13.44 %	22,600.00
1-5384-00	Computer Services	17,700.00	20,423.88	-2,723.88	-15.39 %	70,800.00	68,090.99	2,709.01	3.83 %	217,300.00
1-5410-00	Salaries/Wages-Administration	98,450.00	78,093.46	20,356.54	20.68 %	393,800.00	331,238.59	62,561.41	15.89 %	1,181,400.00
1-5411-00	Salaries & Wages - Field	140,000.00	115,312.63	24,687.37	17.63 %	531,000.00	499,104.88	31,895.12	6.01 %	1,666,000.00
1-5420-00	Payroll Tax Expense	16,000.00	12,695.04	3,304.96	20.66 %	64,300.00	58,472.81	5,827.19	9.06 %	206,700.00
1-5435-00	Employee Medical Insurance	44,000.00	40,957.88	3,042.12	6.91 %	176,000.00	166,350.02	9,649.98	5.48 %	542,100.00
1-5436-00	Retiree Medical Insurance	5,000.00	4,968.68	31.32	0.63 %	20,000.00	18,709.37	1,290.63	6.45 %	63,900.00
1-5440-00	Employees Retirement Plan	43,100.00	53,086.93	-9,986.93	-23.17 %	170,600.00	194,951.49	-24,351.49	-14.27 %	518,600.00
1-5445-00	Supplemental Retirement 401a	0.00	0.00	0.00	0.00 %	0.00	0.00	0.00	0.00 %	35,000.00
1-5510-00	Motor Vehicle Expense	6,425.00	5,995.71	429.29	6.68 %	25,700.00	23,696.30	2,003.70	7.80 %	77,100.00
1-5620-00	Office & Billing Expenses	27,000.00	34,135.81	-7,135.81	-26.43 %	110,000.00	114,978.67	-4,978.67	-4.53 %	328,500.00
1-5625-00	Meetings / Training / Seminars	2,750.00	195.00	2,555.00	92.91 %	11,000.00	4,478.53	6,521.47	59.29 %	33,000.00
1-5630-00	Insurance	13,500.00	10,601.76	2,898.24	21.47 %	54,000.00	45,783.47	8,216.53	15.22 %	163,300.00
1-5687-00	Membership, Dues, Subscript.	7,200.00	21,811.16	-14,611.16	-202.93 %	28,800.00	44,046.37	-15,246.37	-52.94 %	87,400.00
1-5689-00	Labor Relations	500.00	0.00	500.00	100.00 %	2,000.00	0.00	2,000.00	100.00 %	6,000.00
1-5700-00	San Mateo County Fees	3,000.00	2,070.00	930.00	31.00 %	7,400.00	3,660.00	3,740.00	50.54 %	25,700.00
1-5705-00	State Fees	0.00	0.00	0.00	0.00 %	3,000.00	493.00	2,507.00	83.57 %	37,500.00
	Total ExpType: 1 - Operating:	**936,943.00**	**895,263.73**	**41,679.27**	**4.45 %**	**3,776,922.00**	**3,546,318.54**	**230,603.46**	**6.11 %**	**9,396,221.00**
ExpType: 4 - Capital Related										
1-5715-00	Debt Service/CIEDB 11-099	0.00	0.00	0.00	0.00 %	271,045.00	271,044.86	0.14	0.00 %	335,825.00
1-5716-00	Debt Service/CIEDB 2016	0.00	0.00	0.00	0.00 %	236,795.00	236,794.72	0.28	0.00 %	322,895.00
1-5717-00	Chase Bank - 2018 Loan	0.00	0.00	0.00	0.00 %	376,657.00	376,657.43	-0.43	0.00 %	435,168.00
	Total ExpType: 4 - Capital Related:	**0.00**	**0.00**	**0.00**	**0.00 %**	**884,497.00**	**884,497.01**	**-0.01**	**0.00 %**	**1,093,888.00**
	Total Expense:	**936,943.00**	**895,263.73**	**41,679.27**	**4.45 %**	**4,661,419.00**	**4,430,815.55**	**230,603.45**	**4.95 %**	**10,490,109.00**
	Report Total:	**354,917.00**	**260,802.83**	**-94,114.17**		**652,201.00**	**1,116,701.01**	**464,500.01**		**4,436,141.00**

COASTSIDE COUNTY WATER DISTRICT
MONTHLY INVESTMENT REPORT
October 31, 2021

RESERVE BALANCES	**Current Year as of 10/31/2021**	**Prior Year as of 10/31/2020**
CAPITAL AND OPERATING RESERVE	$10,316,848.09	$8,191,027.93
RATE STABILIZATION RESERVE	$250,000.00	$250,000.00
TOTAL DISTRICT RESERVES	**$10,566,848.09**	**$8,441,027.93**

ACCOUNT DETAIL

ACCOUNTS WITH TRI COUNTIES BANK		
CHECKING ACCOUNT	$5,224,871.47	$3,032,087.65
CSP T & S ACCOUNT	$48,112.12	$136,637.72
MONEY MARKET GEN. FUND (Opened 7/20/17)	$19,449.84	$19,447.86
LOCAL AGENCY INVESTMENT FUND (LAIF) BALANCE	$5,273,614.66	$5,252,054.70
DISTRICT CASH ON HAND	$800.00	$800.00
TOTAL ACCOUNT BALANCES	**$10,566,848.09**	**$8,441,027.93**

This report is in conformity with CCWD's Investment Policy.

COASTSIDE COUNTY WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS - STATUS REPORT
FISCAL YEAR 2021/2022

* Approved June 2020

10/31/2021

		Status	Approved* CIP Budget FY21/22	. To Date FY21/22	Projected Year-End FY21/22	Variance vs. Budget	% Completed	Project Status/ Comments
Equipment Purchases & Replacement								
06-03	SCADA/Telemetry/Electrical Controls Replacement	ongoing	$ 50,000		$ 50,000	$ -	0%	
Facilities & Maintenance								
09-09	Fire Hydrant Replacement	ongoing	$ 140,000		$ 140,000	$ -	0%	
99-01	Meter Change Program	ongoing	$ 20,000		$ 20,000	$ -	0%	
Pipeline Projects								
14-27/20-08	Grandview Pipeline Replacement Project	in design	$ 1,650,000	$ 18,586	$ 1,650,000	$ -	0%	
						$ -		
Pump Stations / Tanks / Wells								
08-14	Alves Tank Rehabilitation/Replacement Design	TBD	$ 300,000			$ 300,000	n/a	Not planned for FY2021/22
08-16	Cahill Tank Rehabilitation	TBD	$ 125,000			$ 125,000	n/a	Delayed to FY2022/23
20-16	Denniston Tank Rehabilitation	TBD	$ 125,000			$ 125,000	n/a	Delayed to FY2022/23
19-05	Tanks - THM Control	Ongoing	$ 50,000		$ 50,000	$ -	0%	
Water Supply Development								
14-25	Denniston/San Vicente Water Supply Development	ongoing	$ 300,000	$ 22,631	$ 300,000	$ -	n/a	
Water Treatment Plants								
20-14	Nunes Water Treatment Plant Improvement Project	Construction	$ 2,900,000	$ 1,222,325	$ 4,000,000	$ (1,100,000)	0%	Construction started August 2021
UNSCHEDULED/NEW CIP ITEMS FOR CURRENT FISCAL YEAR 2021/2022								
NN-00	Unscheduled CIP		$ 100,000		$ 100,000	$ -	0%	
22-01	Miramontes Point Road Water Main Replacement	in design		45,051	150,000	$ (150,000)		
66-3001	Green Slope Climber			105,216	105,216	$ (105,216)		
	NEW FY2020/2021 CIP TOTAL		**$ 5,760,000**	**$ 1,413,809**	**$ 6,565,216**	**$ (805,216)**		
FY2019/2020 CIP Carryover Projects								
20-07	District Office Improvements	in process	$ 120,000	$ 119,382	$ 130,000	$ (10,000)	60%	
14-01	Highway 92 - Replacement of Welded Steel Line-Phase 1	open	$ 700,000	11,527	$ 700,000	$ -	0%	
66-3001	Valve truck	Completed	$ 75,361	$ 75,361	$ 75,361	$ -	100%	Valve truck - Delivered in July 2021 - $225K total price
22-05	Planning Software	open	$ 60,000		$ 100,000	$ (40,000)	0%	Approved at August 2021 BOD meeting
13-02	Pipeline Replacement Under Creek at Pilarcitos Ave (Strawflower)	In CEQA	$ 700,000	$ 26,379	$ 700,000	$ -	D-100%	CEQA in process
14-01	Highway 92 - Replacement of Welded Steel Line-Design	Open	$ 100,000	$ 18,140	$ 100,000	$ -	18%	for engineering design only

COASTSIDE COUNTY WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS - STATUS REPORT
FISCAL YEAR 2021/2022

10/31/2021

* Approved June 2020

		Status	Approved* CIP Budget FY21/22	. To Date FY21/22	Projected Year-End FY21/22	Variance vs. Budget	% Completed	Project Status/ Comments
21-07	Carter Hill Tank Improvement Project	In design	$ 580,000	$ 35,765	$ 580,000	$ -	n/a	Design in process - will continue into Fiscal Year 2021/22
	FY2020/2021 CARRYOVER PROJECTS		**$ 2,335,361**	**$ 286,554**	**$ 2,385,361**	**$ (50,000)**		
	Green = approved by the Board/in process							
	TOTAL - FY 2021/2022 CIP + PRIOR YEAR CARRYOVER		**$ 8,095,361**	**$ 1,700,363**	**$ 8,950,577**	**$ (855,216)**		

Legal Cost Tracking Report
12 Months At-A-Glance

Acct. No.5681
Patrick Miyaki - HansonBridgett, LLP
Legal

Month	Admin (General Legal Fees)	Water Supply Develpmnt	Recycled Water	Transfer Program	CIP	LABOR & EMPLOYMENT	Election (CVRA)	Litigation	Infrastructure Project Review (Reimbursable)	TOTAL
Oct-20	6,655			313	3,351					**10,319**
Nov-20	8,517			287	2,049	1,260				**12,113**
Dec-20	10,460			243	265					**10,968**
Jan-21	12,336			592		1,628				**14,556**
Feb-21	7,733			589	355					**8,677**
Mar-21	17,385			180	1,662	407				**19,633**
Apr-21	11,122			1,609	1,319					**14,050**
May-21	10,870			709		407				**11,986**
Jun-21	7,659			752	588					**8,999**
Jul-21	3,323									**3,323**
Aug-21	4,701			442		2,901				**8,043**
Sep-21	10,969				814					**11,783**
TOTAL	**111,729**	**0**	**0**	**5,715**	**10,403**	**6,603**	**0**	**0**	**0**	**134,448**

Engineer Cost Tracking Report
12 Months At-A-Glance

Acct. No. 5682
JAMES TETER
Engineer

Month	Admin & Retainer	CIP	Studies & Projects	TOTAL	Reimburseable from Projects
Nov-20	480		845	**1,325**	845
Dec-20	480		169	**649**	169
Jan-21	480		3,042	**3,522**	3,042
Feb-21	480		2,028	**2,508**	2,028
Mar-21	480		3,380	**3,860**	3,380
Apr-21	480			**480**	
May-21	480		169	**649**	169
Jun-21	480		1,352	**1,832**	1,352
Jul-21	480	896	3,042	**4,418**	3,042
Aug-21	480			**480**	3,042
Sep-21	480			**480**	
Oct-21	480			**480**	
TOTAL	**5,760**	**896**	**14,027**	**20,683**	**17,069**

Calcon T&M Projects Tracking

9/30/2021

Project No.	Name	Status	Proposal Date	Approved Date	Project Budget	Project Actual thru 6/30/20	Project Billings FY2020-2021
Closed Projects:							
CAL-13-01	EG Tank 2 Recoating Project	Closed	9/30/13	10/8/13	$8,220.00	$ 8,837.50	
CAL-13-02	Nunes Control System Upgrades	Closed	9/30/13	10/8/13	$46,141.00	$ 55,363.60	
CAL-13-03	Win 911 and PLC Software	Closed	9/30/13	10/8/13	$9,717.00	$ 12,231.74	
CAL-13-04	Crystal Springs Surge Tank Retrofit	Closed	11/26/13	11/27/13	$31,912.21	$ 66,572.54	
CAL-13-06	Nunes Legacy Backwash System Removal	Closed	11/25/13	11/26/13	$6,516.75	$ 6,455.00	
CAL-13-07	Denniston Backwash FTW Valves	Closed	11/26/13	11/27/13	$6,914.21	$ 9,518.28	
CAL-14-01	Denniston Wash Water Return Retrofit	Closed	1/28/14	2/14/14	$13,607.00	$ 13,591.60	
CAL-14-02	Denniston Calrifier SCADA Data	Closed	4/2/14	4/7/14	$4,125.00	$ 4,077.50	
CAL-14-03	Nunes Surface Scatter Turbidimeter	Closed	4/2/14	4/7/14	$2,009.50	$ -	
CAL-14-04	Phase I Control System Upgrade	Closed	4/2/14	4/7/14	$75,905.56	$ 44,459.14	
CAL-14-06	Miramar Control Panel	Closed	8/28/14	8/28/14	$37,953.00	$ 27,980.71	
CAL-14-08	SFWater Flow & Data Logger/Cahill Tank	Closed	8/20/2014	8/20/2014	$1,370.00	$ 1,372.00	
CAL-15-01	Main Street Monitors	Closed				$ 6,779.42	
CAL-15-02	Dennistion To Do List	Closed				$ 2,930.00	
CAL-15-03	Nunes & Denniston Turbidity Meters	Closed			$6,612.50	$ 12,536.12	
CAL-15-04	Phase II Control System Upgrade	Closed	6/23/2015	8/11/2015	$195,000.00	$ 202,227.50	
CAL-15-05	Permanganate Water Flow	Closed				$ 1,567.15	
CAL-16-04	Radio Network	Closed	12/9/2016	1/10/2017	$126,246.11	$ 139,200.68	
CAL-16-05	El Granada Tank No. 3 Recoating	Closed	12/16/2016		$6,904.50	$ 6,845.00	
CAL-17-03	Nunes Valve Control	Closed	6/29/2017	7/11/2017	$73,281.80	$ 79,034.35	
CAL-17-04	Denniston Booster Pump Station	Closed	7/27/2017	8/8/2017	$21,643.75	$ 29,760.00	
CAL-17-05	Crystal Springs Pump Station #3 Soft Start	Closed	7/27/2017	8/8/2017	$12,213.53	$ 12,178.13	
CAL-18-04	Tank Levels Calibration Special	Closed	3/5/2018	3/5/2018	$8,388.75	$ 10,700.00	
CAL-18-05	Pilarcitos Stream Flow Gauge -Well 1 120 Service Power	Closed	3/22/2018	3/22/2018	$3,558.13	$ 3,997.40	
CAL-17-06	Nunes Flocculartor & Rapid Mix VFD Panels	Closed	12/6/2017	12/12/2017	$29,250.75	$ 30,695.66	
CAL-17-01	Crystal Springs Leak Valve Control	Closed	2/8/2017	2/14/2017	$8,701.29	$ 18,055.88	
CAL-17-02	Crystal Springs Requirements & Addtl Controls	Closed	2/8/2017	2/14/2017	$38,839.50	$ 41,172.06	
CAL-18-02	Nunes Plant HMI V2	Closed	11/12/2018		$10,913.14	$ 9,434.90	
CAL-18-03	CSP Breakers & Handles		3/7/2018	3/7/2018	$25,471.47	$ 49,837.52	
CAL-18-06	Nunes VFD Project		9/6/2018	9/6/2018	$2,381.51	$ 895.50	
CAL-19-01	CSP Cla-Val Power Checks		2/4/2019	2/4/2019	$15,067.91	$ 40,475.94	
CAL-19-02	CSP Wet Well		4/1/2019	4/1/2019	$12,960.24	$ 12,853.20	
CAL-19-03	Pilarcitos Flow Meter Project		4/1/2019	4/1/2019	$14,493.75	$ 17,616.84	
	CSP Main Breaker						
CAL-19-04	SCADA Systems		10/15/2019	10/15/2019	$104,000.00	$ 114,250.00	
	Spare 350/500 Pumps					$ 3,327.09	
	CSP Main Breaker					$ 5,220.00	
		Closed Projects - Subtotal (pre FY2019-2021)			$960,319.86	$1,102,049.95	
FY 2020-2021 Open Projects:							
		Open Projects - Subtotal			$0.00	$0.00	$0.00

Other: Maintenance		
Tanks	$	24,807.00
Crystal Springs Maintenance	$	1,639.94
Nunes Maintenance	$	43,588.96
Denniston Maintenance	$	37,309.33
Distribution System	$	54,332.43
Wells		
Cellular Telemetry	$	2,895.39
Subtotal Maintenance	$	164,573.05
FINAL TOTAL FY 2020/21	$	164,573.05

EKI Environment & Water
Engineering Services Billed Through October 31, 2021

		Contract Date	Not to Exceed Budget	Status	FY 2018-2019	FY 2019-2020	FY2020-2021	FY2021-2022
CIP Project Management								
Fiscal Year 2018-2019		10.19.2018	$ 25,000.00	Complete				
Fiscal Year 2018-2019		1.14.2019	$ 40,000.00	Complete				
Fiscal Year 2018-2019		3.12.2019	$ 75,000.00	Complete				
Fiscal Year 2019-2020		7.29.2019	$ 180,000.00	Open	$ 123,410.00	$ 104,108.97	$ 1,138.80	
Pipeline Projects (Ferdinand) - T2			$ 2,000.00		$ 18,220.42	$ 13,476.55		
Tank Seismic Projects - T3					$ 16,676.92	$ 19,249.53		
Hydraulic Modeling - T4					$ (4,385.04)	$ 20,570.20		
Fiscal Year 2020-2021		8.13.2020	$ 100,000.00				$ 67,075.84	$ 8,556.08
Sub Total - CIP Project Management Services			$ 422,000.00		$ 163,452.66	$ 157,405.25	$ 68,214.64	$ 8,556.08
Highway 1 South Pipeline Replacement Project	**16-02**	9.20.2018	$ 25,000.00	Complete	$ 17,680.45			
Ferdinand Avenue Pipeline Replacement Design	**14-31**	2.12.2019	$ 29,000.00	Complete	$ 27,824.37	$ 1,169.10		
Casa Del Mar Main Replacement (Phase 1) and Grand Boulevard Pipeline/PRV Loop Design	**14-32**	2.12.2019	$ 28,500.00	Complete	$ 27,297.34	$ 1,195.22		
Denniston Culvert Replacement and Paving Project Design	**18-13**	7.1.2019	$ 16,400.00	Complete	$ 804.96	$ 21,296.34		
Denniston Culvert Replacement-Engineering Services during Construction	**18-13**	7.8.2020	$ 48,800.00	Complete			$ 47,647.17	
Construction Inspection Services for Ferdinand Avenue Water Main Replacement Project	**14-31**	7.1.2019	$ 32,300.00	Complete		$ 32,300.00		
Pine Willow Oak Water Main Replacement Project	**18-01**	7.29.2019	$ 69,700.00	Complete		$ 49,906.63	$ 4,991.74	
Grandview Water Main Replacement Project (Design, Bid Support, construction support)	**14-27**	7.29.2019	$ 56,100.00	Open		$ 42,095.19	$ 5,144.36	
Grandview Crossing at Hwy 1		2.9.2021	$ 156,500.00	Open			$ 73,285.99	$ 18,093.63
Pilarcitos Creek Crossing Water Main Replacement Preliminary Design	**13-02**	8.27.2019	$ 104,600.00	Complete		$ 95,332.59	$ 1,226.50	
Pilarcitos Creek Crossing Water Main Replacement Design	**13-02**	7.14.2020	$ 82,900.00	Open			$ 39,343.06	$ 2,974.40
Grandview/Silver/Terrace/Spindrift Under Hwy 1 PreDesign	**20-08**	10.15.2019	$ 59,600.00	Complete		$ 18,217.30	$ 40,597.27	
Highway 92 Potable Water Pipeline Replacement Project Design	**14-01**	7.2.2021	$ 24,800.00	Open				$ 18,139.94
Miramontes Point Road Water Main Replacement	**22-01**	7.14.2021	$ 116,800.00	Open				$ 35,051.32
Total - All Services			**$ 1,273,000.00**		**$ 237,059.78**	**$ 418,917.62**	**$ 280,450.73**	**$ 82,815.37**

COASTSIDE COUNTY WATER DISTRICT

766 MAIN STREET

HALF MOON BAY, CA 94019

MINUTES OF THE REGULAR MEETING OF THE BOARD OF DIRECTORS

Tuesday October 12, 2021

Due to the Covid-19 pandemic, and in accordance with Assembly Bill 361, which modifies California Government Code Section 54953, the Boardroom was not open to the public for the October 12, 2021, Regular Meeting of the Board of Directors of the Coastside County Water District. The Regular Meeting was conducted remotely via teleconference.

The Public was able to watch and/or participate in the public meeting by joining the meeting through the Zoom Video Conference link provided. The public was also able to join the meeting by calling a provided teleconference phone number.

1) ROLL CALL –President Glenn Reynolds called the meeting to order at 7:03 p.m. participating in roll call via Zoom Video Conference: Directors John Muller, Ken Coverdell, Chris Mickelsen and Vice-President Feldman.

Also present: Mary Rogren, General Manager, Patrick Miyaki, Legal Counsel; James Derbin, Superintendent of Operations; Cathleen Brennan, Water Resource Analyst; Gina Brazil, Office Manager, Denise Ford, Administrative Assistant/Recording Secretary, and Nancy Trujillo, Accounting Manager.

Members of the public: Michelle Dragony and August Howell.

2) **PLEDGE OF ALLEGIANCE**

3) PUBLIC COMMENT – There were no public comments.

4) CONSENT CALENDAR

A. Approval of disbursements for the month ending September 30, 2021:
   Claims: $1,422,799.47; Payroll: $179,448.13 for a total of $1,602,247.60
B. Acceptance of Financial Reports
C. Approval of Minutes of September 14, 2021, Regular Board of Directors Meeting
D. Installed Water Connection Capacity and Water Meters Report
E. Total CCWD Production Report
F. CCWD Monthly Sales by Category Report-September 2021
G. Monthly Planned Plant or Tank Discharge and New Water Line Flushing Report
H. Monthly Rainfall Reports

I. Approval for Vice-President Feldman to attend the Association of California Water Agencies (ACWA) Fall Virtual Conference & Exhibition, November 30-December 2, 2021
J. SFPUC Hydrological Report for the Month of August 2021

Director Muller stated he had reviewed the monthly financial claims and found all to be in order.

ON MOTION BY Vice-President Feldman and seconded by Director Muller, the Board voted by roll call vote to approve the Consent Calendar:

Director Muller	**Aye**
Director Coverdell	**Aye**
Director Mickelsen	**Aye**
Vice-President Feldman	**Aye**
President Reynolds	**Aye**

5) MEETINGS ATTENDED/DIRECTOR COMMENTS

Director Coverdell stated that he would like to see an agenda item added to the Consent Calendar showing the monthly progress the District's customers are making in reducing their water use in response to the drought. The purpose of adding the agenda item would be to keep this issue at the forefront of everyone's attention.

Director Mickelsen attended the BAWSCA meeting and stated that the negotiated settlement on the Tuolumne River was on the back burner as discussions are now focused on the drought and the State Water Resource Control Board's curtailment order for the Delta watershed.

Vice-President Feldman met with staff at the Nunes Water Treatment Plant to review the progress on the Upgrade Project and stated that he was very impressed with the work completed over the past two months.

6) GENERAL BUSINESS

A. <u>Consider Approval of Resolution 2021-06 Making Findings Pursuant to Assembly Bill 361 that the Proclaimed State of Emergency Continues to Impact the Ability to Meet Safely in Person</u>

Ms. Rogren summarized Governor Newsom's Executive Order dated back on March 4, 2020, that declared a State of Emergency to exist in California because of the threat of COVID 19. The Executive Order N-29-20 suspended certain provisions of the Ralph M. Brown Act relating to teleconferencing to allow legislative bodies to conduct meetings remotely to help protect the spread of COVID-19 and to protect the health and safety of the public. On June 11, 2021, the Governor issued Executive Order N-08-21 which specified that Executive Order N-29-20 remain in effect through September 30, 2021.

On September 16, 2021, the Governor signed Assembly Bill (AB361) into law to allow legislative bodies to continue to meet remotely during a proclaimed State of Emergency after September 30,

2021. Therefore, the Board will consider adopting Resolution 2021-06 proclaiming that the State of Emergency continues to impact the ability of members to meet safely in person.

ON MOTION BY Vice-President Feldman and seconded by Director Muller, the Board voted by roll call vote to approve Resolution 2021-06 Making Findings Pursuant to Assembly Bill 361 that the Proclaimed State of Emergency Continues to Impact the Ability to Meet Safely in Person:

Director Muller	**Aye**
Director Coverdell	**Aye**
Director Mickelsen	**Aye**
Vice-President Feldman	**Aye**
President Reynolds	**Aye**

B. <u>Water Shortage Advisory and Public Outreach Update</u>

Ms. Brennan provided a summary of the water shortage and public outreach. The District is currently 100 percent dependent on imported water and has not been able to use its local sources since May 2021. When comparing the month of September 2021 imported water production data to the month of September 2020 imported water production data, it shows that the District decreased its purchases by only 3.9 percent. The goal is 15 percent reduction to meet SFPUC's request.

Ms. Brennan reported that key outreach activities included arranging for an advertisement in the Half Moon Bay Review Newspaper the last week of October. The same advertisement was also published in the Half Moon Bay Review October Magazine.

Staff is preparing to enter Stage 2 – Water Shortage Warning – of the District's Water Shortage Contingency Plan. Stage 2 begins mandatory reductions in water consumption. Going to the Water Shortage Warning is based on the existing dry conditions and not having access to any local sources. It is also based on the potential for the SFPUC to declare a water supply emergency on November 9th and the District not meeting its voluntary (15%) goals for reductions in water use. Staff anticipates bringing to the Board an ordinance and staff report requesting to implement a Water Shortage Warning after the SFPUC's November 9th meeting.

C. <u>Approval of Professional Services Agreement with Balance Hydrologics, Inc. for Denniston/San Vicente Stream Gaging, Groundwater Monitoring, and Data Analysis</u>

Ms. Rogren summarized the need to provide continuation of gaging and analysis from to year to year. Quantifying the amount of water available for diversion from Denniston and San Vicente Creeks is vitally important to the District's efforts to secure its water rights on those streams.

ON MOTION BY Director Muller and seconded by Director Mickelsen, the Board voted by roll call vote to approve the Professional Services Agreement with Balance Hydrologics, Inc. for Denniston/San Vicente Stream Gaging, Groundwater Monitoring, and Data Analysis:

Director Muller	**Aye**
Director Coverdell	**Aye**
Director Mickelsen	**Aye**
Vice-President Feldman	**Aye**
President Reynolds	**Aye**

D. <u>Approval of Amendment to Professional Services Agreement with EKI Environment and Water, Inc. for Additional Design and Construction Support Services for Miramontes Point Road Water Main Replacement Project to include the Moonridge Neighborhood</u>

Mr. Derbin summarized the need to replace the ductile iron water main that was installed in 1999 on Miramontes Point Road. Since installation, this water main has failed eleven times due to excessive corrosion. An investigation into the potential reasons for the premature failures concluded that the soils were found to be mildly to highly corrosive. At the July 13, 2021, Board of Directors meeting, the Board approved a Professional Service Agreement with EKI for the design and construction support for the Miramontes Point Road Water Main Replacement Project.

Since July 2021, staff has responded to a similar 6" main break in the Moonridge neighborhood located next to Miramontes Point Road. The pipe failure also appeared to be due to excessive corrosion. This Agreement would be an amendment to the original Agreement for design services to include the Moonridge Neighborhood.

ON MOTION BY Director Coverdell and seconded by Director Muller, the Board voted by roll call vote to approve the Amendment to Professional Services Agreement with EKI Environment and Water, Inc. for Additional Design and Construction Support Services for Miramontes Point Road Water Main Replacement Project to include the Moonridge Neighborhood:

Director Muller	**Aye**
Director Coverdell	**Aye**
Director Mickelsen	**Aye**
Vice-President Feldman	**Aye**
President Reynolds	**Aye**

E. Quarterly Financial Review

Ms. Rogren summarized the year-to-date revenue and expenses for the first three months of Fiscal Year 2021-2022. She also recapped CIP expenditures and the District's current cash reserves.

F. Nunes Water Treatment Plant Upgrades Project Update #2

Mr. Derbin gave an update of the progress being made at the Nunes Water Treatment Plant. Freyer and Loretta, Inc., the Construction Management firm on this project, put together a brief summary of the progress to date including a three week look ahead schedule. Major items of work anticipated over the next month include installing the formwork and rebar for the new sedimentation basin walls and pouring the concrete for the walls.

7) MONTHLY INFORMATION REPORTS

A. Superintendent of Operations Report

Mr. Derbin summarized operations highlights for the month of September 2021.

8) DIRECTOR AGENDA ITEMS-REQUESTS FOR FUTURE BOARD MEETINGS

There were no requested future agenda items from the Board members expressed. Ms. Rogren reminded the Board about the special Board meeting that will be held on October 28 starting at 9:00 a.m. and it will be conducted remotely by teleconference.

9) ADJOURNMENT-The Board Meeting was adjourned at 8:22 p.m.

Respectfully submitted,

_____
Mary Rogren, General Manager
Secretary to the District

_____
Glenn Reynolds, President
Board of Directors

COASTSIDE COUNTY WATER DISTRICT
Installed Water Connection Capacity & Water Meters

FY 2022 Meters

Installed Water Meters	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
HMB Non-Priority													
0.5" capacity increase													
5/8" meter				2									**2**
3/4" meter													
1" meter													
1 1/2" meter													
2" meter													
3" meter													
HMB Priority													
0.5" capacity increase													
5/8" meter													
3/4" meter													
1" meter													
1 1/2" meter													
2" meter													
County Non-Priority													
0.5" capacity increase													
5/8" meter	2	3	1	1									**7**
3/4" meter													
1" meter													
County Priority													
5/8" meter													
3/4" meter													
1" meter													
1.5" meter													
Totals	2	3	1	3									**9**

5/8" meter = 1 connection
3/4" meter = 1.5 connections
1" meter = 2.5 connections
1.5" meter = 5 connections
2" meter = 8 connections
3" meter= 17.5 connections

FY 2020 Capacity (5/8" connection equivalents)	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals
HMB Non-Priority				2									**2**
HMB Priority													
County Non-Priority	2	3	1	1									**7**
County Priority													
Total	2	3	1	3									**9**

TOTAL CCWD PRODUCTION (MG) ALL SOURCES- FY 2022

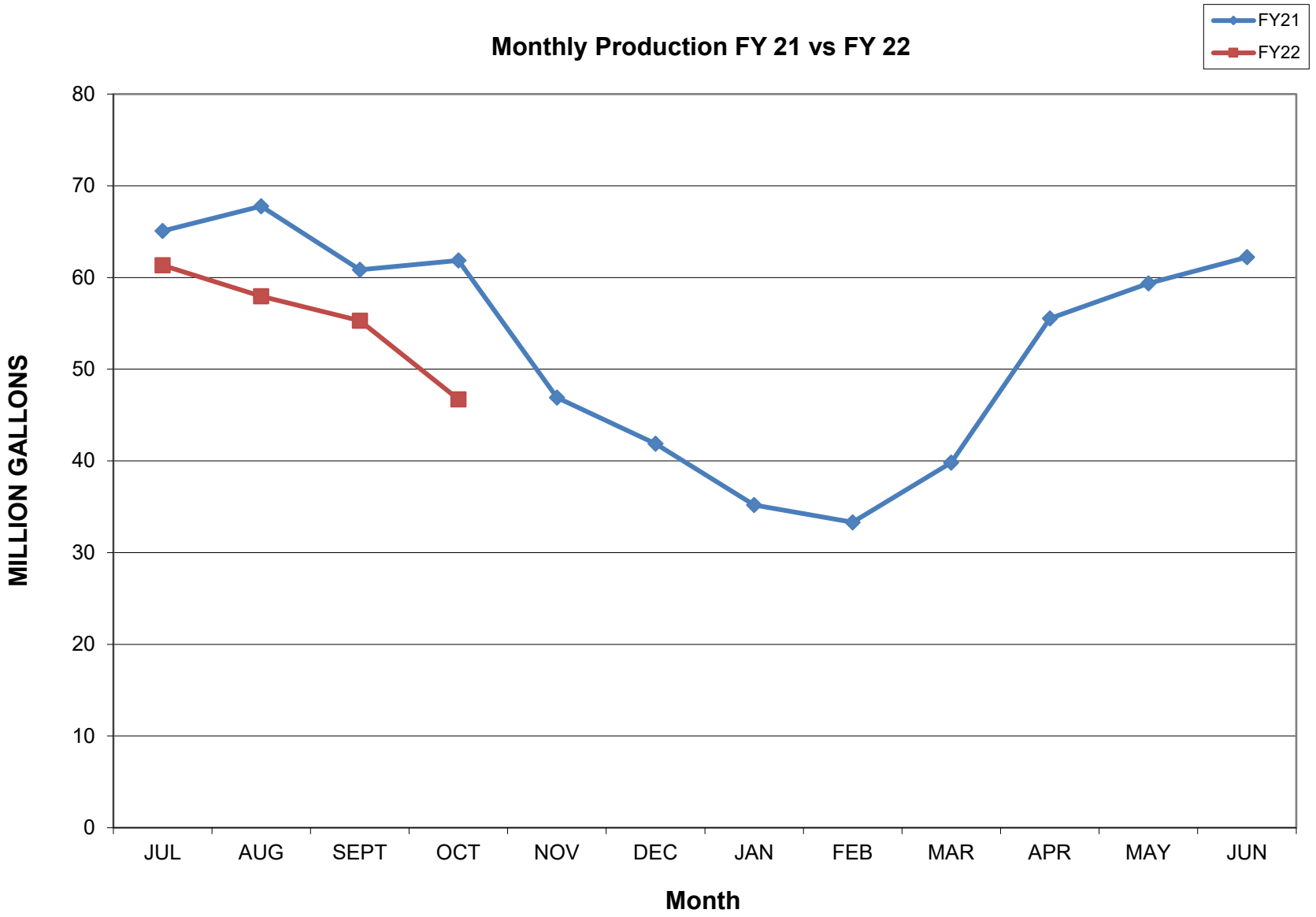
	CCWD Sources			SFPUC Sources				
	DENNISTON WELLS	DENNISTON RESERVOIR	PILARCITOS WELLS	PILARCITOS LAKE	CRYSTAL SPRINGS RESERVOIR	RAW WATER TOTAL	UNMETERED WATER	TREATED TOTAL
JUL	0.00	0.00	0.00	0.00	65.93	65.93	4.60	61.33
AUG	0.00	0.00	0.00	0.00	61.90	61.90	3.95	57.95
SEPT	0.00	0.00	0.00	0.00	59.74	59.74	4.45	55.29
OCT	0.53	2.10	0.00	3.69	44.32	50.64	3.92	46.72
NOV								0.00
DEC								0.00
JAN								0.00
FEB								0.00
MAR								0.00
APR								0.00
MAY								0.00
JUN								0.00
TOTAL	0.53	2.10	0.00	3.69	231.89	238.21	16.92	221.29
% MONTHLY TOTAL	1.0%	4.1%	0.0%	7.3%	87.5%	100.0%	7.7%	92.3%
% ANNUAL TO DATE TOTAL	0.2%	0.9%	0.0%	1.5%	97.3%	100.0%	7.1%	92.9%

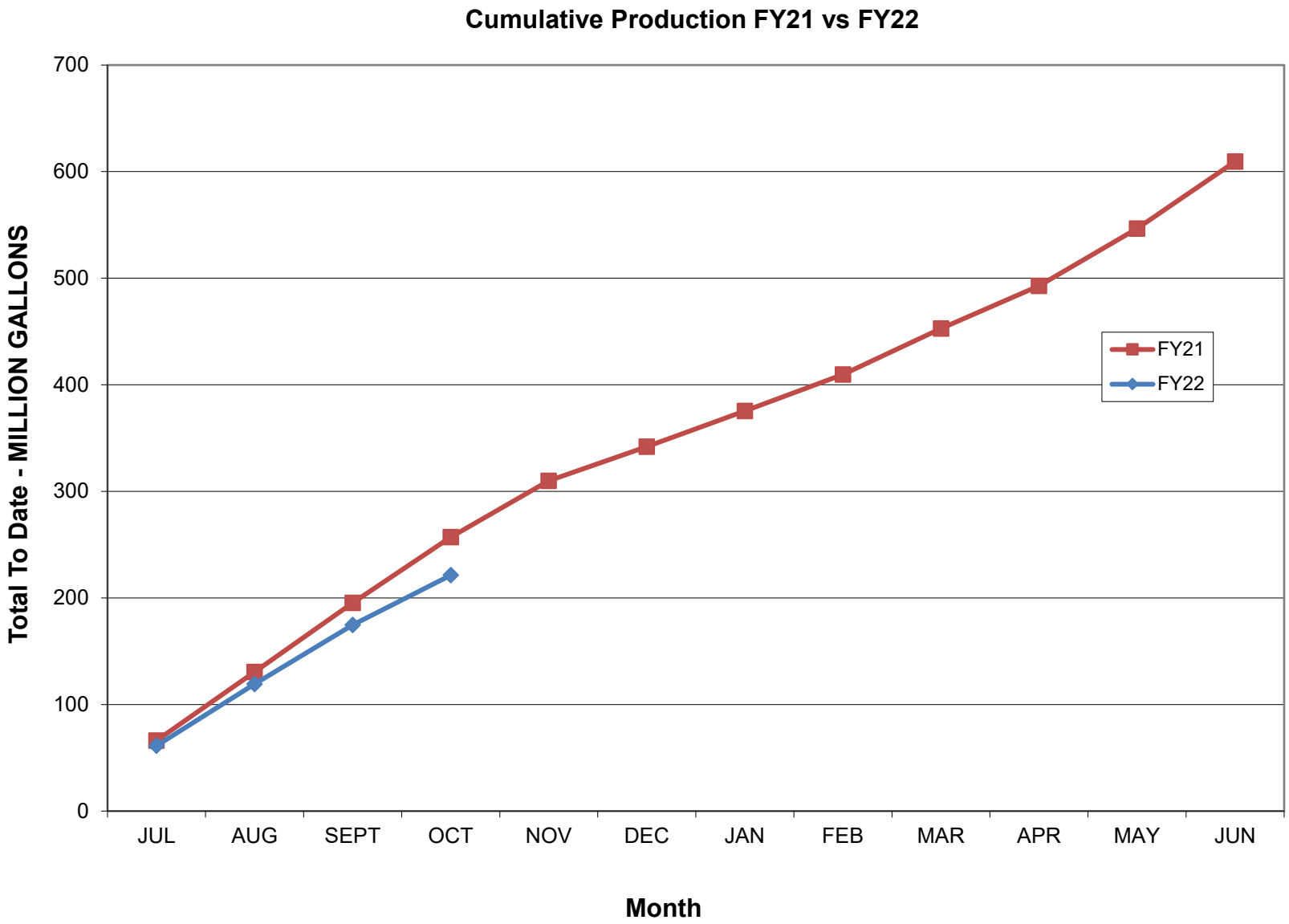
CCWD vs SFPUC- month	5.2%
CCWD vs SFPUC- annual	1.1%

12 Month Running Treated Total **610.60**

TOTAL CCWD PRODUCTION (MG) ALL SOURCES- FY 2021

	CCWD Sources			SFPUC Sources				
	DENNISTON WELLS	DENNISTON RESERVOIR	PILARCITOS WELLS	PILARCITOS LAKE	CRYSTAL SPRINGS RESERVOIR	RAW WATER TOTAL	UNMETERED WATER	TREATED TOTAL
JUL	0.02	2.54	0.00	28.80	36.06	67.42	2.35	65.07
AUG	0.00	0.00	0.00	49.75	20.27	70.02	2.25	67.78
SEPT	0.00	0.00	0.00	1.31	60.84	62.15	1.31	60.84
OCT	0.00	0.00	0.00	0.00	63.97	63.97	2.11	61.86
NOV	0.00	0.00	3.91	14.39	29.52	47.82	0.93	46.90
DEC	2.26	12.69	11.17	14.25	4.16	44.53	2.67	41.86
JAN	1.73	13.04	11.06	1.99	10.86	38.68	3.50	35.18
FEB	0.78	16.51	10.87	0.00	9.60	37.76	4.45	33.31
MAR	1.98	17.11	10.47	0.00	13.08	42.64	2.82	39.82
APR	1.40	12.72	0.00	0.00	44.48	58.60	3.06	55.54
MAY	0.88	3.90	0.00	0.00	60.44	65.22	5.87	59.35
JUN	0.00	0.00	0.00	0.00	64.08	64.08	1.86	62.22
TOTAL	9.05	78.51	47.48	110.49	417.36	662.89	33.17	629.71
% TOTAL	1.4%	11.8%	7.2%	16.7%	63.0%	100.0%	5.00%	0.0%


Monthly Production FY 21 vs FY 22
FY21
FY22
MILLION GALLONS
80
70
60
50
40
30
20
10
0
JUL
AUG
SEPT
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
Month


Cumulative Production FY21 vs FY22
Total To Date - MILLION GALLONS
700
600
500
400
300
200
100
0
JUL
AUG
SEPT
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
Month
FY21
FY22

Coastside County Water District Monthly Sales By Category (MG)
FY2022

	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	MG to Date
RESIDENTIAL	29.63	28.15	28.29	26.89									**112.96**
COMMERCIAL	3.00	2.96	2.91	2.96									**11.82**
RESTAURANT	1.52	1.36	1.33	1.38									**5.59**
HOTELS/MOTELS	2.73	2.90	2.39	2.46									**10.48**
SCHOOLS	0.70	0.63	0.81	0.54									**2.68**
MULTI DWELL	2.60	2.50	2.59	2.71									**10.41**
BEACHES/PARKS	0.68	0.79	0.64	0.69									**2.80**
AGRICULTURE	6.54	5.54	6.40	7.01									**25.49**
RECREATIONAL	0.23	0.21	0.21	0.22									**0.86**
MARINE	0.59	0.51	0.45	0.43									**1.98**
RES. IRRIGATION	1.40	1.51	1.50	1.15									**5.55**
DETECTOR CHECKS	0.01	0.01	0.01	0.00									**0.03**
NON-RES. IRRIGATION	4.05	5.39	5.06	0.50									**15.00**
RAW WATER	7.74	7.11	7.52	8.01									**30.37**
PORTABLE METERS	0.19	0.30	0.34	0.27									**1.09**
CONSTRUCTION	0.33	0.30	0.33	0.34									**1.30**
TOTAL - MG	**61.92**	**60.17**	**60.78**	**55.55**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**238.42**
Non Residential Usage	32.29	32.02	32.49	28.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Running 12 Month Total				**621.24**									
12 mo Residential				**322.53**									
12 mo Non Residential				**298.72**									

FY2021

	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	MG to Date
RESIDENTIAL	34.24	32.73	32.19	32.12	28.27	26.25	24.28	21.71	23.49	27.64	28.08	29.85	**340.85**
COMMERCIAL	2.86	2.67	2.64	3.03	2.58	2.38	2.22	2.15	2.55	2.64	2.67	2.83	**31.22**
RESTAURANT	1.01	1.06	1.01	1.19	1.06	0.85	0.65	0.75	1.02	1.23	1.09	1.31	**12.22**
HOTELS/MOTELS	2.19	2.04	2.02	2.13	1.71	1.19	1.04	1.22	1.67	2.02	1.75	2.34	**21.33**
SCHOOLS	0.76	0.68	0.61	0.67	0.46	0.25	0.22	0.18	0.16	0.34	0.36	0.59	**5.27**
MULTI DWELL	3.14	3.01	2.83	2.98	2.70	2.52	2.48	2.33	2.49	2.76	2.65	2.70	**32.60**
BEACHES/PARKS	0.76	0.85	0.60	0.52	0.57	0.35	0.37	0.25	0.21	0.42	0.39	0.54	**5.83**
AGRICULTURE	5.31	4.65	4.73	5.92	4.42	3.66	3.10	3.40	4.49	6.47	9.29	6.81	**62.27**
RECREATIONAL	0.24	0.24	0.23	0.23	0.20	0.17	0.17	0.16	0.18	0.20	0.18	0.22	**2.42**
MARINE	0.64	0.59	0.53	0.56	0.46	0.55	0.45	0.48	0.41	0.46	0.44	0.45	**6.03**
RES. IRRIGATION	1.70	1.66	1.56	1.51	1.10	0.69	0.39	0.25	0.35	1.04	1.41	1.48	**13.14**
DETECTOR CHECKS	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	**0.07**
NON-RES. IRRIGATION	6.73	5.04	2.23	2.31	1.26	0.31	0.21	0.13	0.15	3.05	2.08	4.91	**28.41**
RAW WATER	7.92	6.89	7.00	8.07	6.82	5.72	0.91	0.00	3.93	4.20	7.39	7.46	**66.32**
PORTABLE METERS	0.53	0.26	0.33	0.30	0.26	0.18	0.15	0.14	0.13	0.19	0.23	0.27	**2.97**
CONSTRUCTION	0.38	0.38	0.31	0.39	0.30	0.29	0.28	0.26	0.30	0.32	0.33	0.30	**3.83**
TOTAL - MG	**68.43**	**62.77**	**58.83**	**61.93**	**52.17**	**45.37**	**36.95**	**33.41**	**41.53**	**52.99**	**58.35**	**62.05**	**634.79**

MONTH **Oct-21**

Coastside County Water District Monthly Discharge Report

EMERGENCY MAIN AND SERVICE REPAIRS

	Date Reported Discovered	Date Repaired	Location	Pipe Class	Pipe Size & Type	Estimated Water Loss (MG)
1	10/7/2021	10/7/21	Miramontes Point Rd	Main	10 " DI	0.020
2						
3						
4						
5						
6						
7						
8						
					Totals	**0.020**

OTHER DISCHARGES

Total Volumes (MG)	
Flushing Program	0.008
Reservoir Cleaning	
Automatic Blowoffs	0.168
Dewatering Operations	
Other (includes flow testing)	0.000

DISCHARGES GRAND TOTAL (MG)

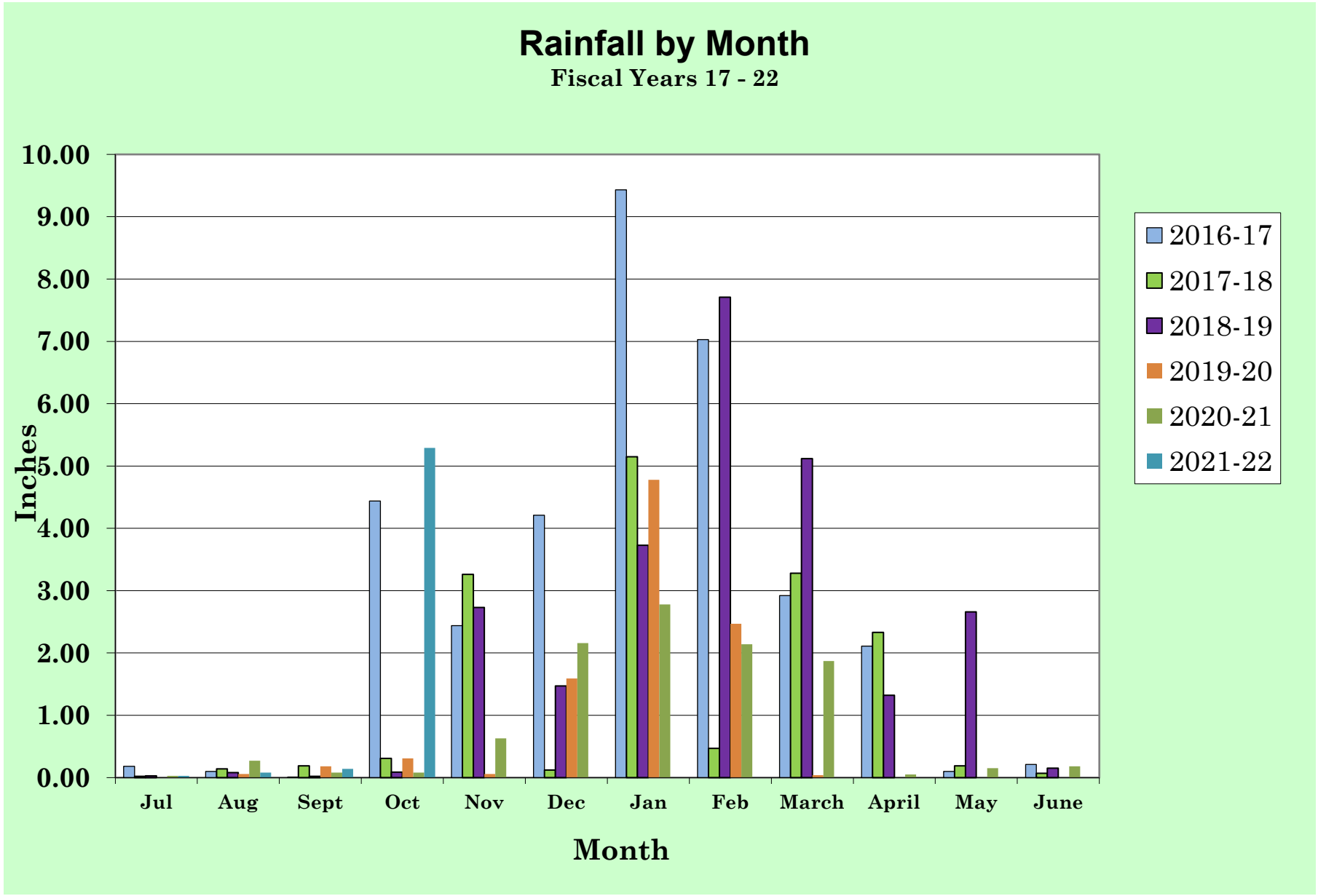
0.176

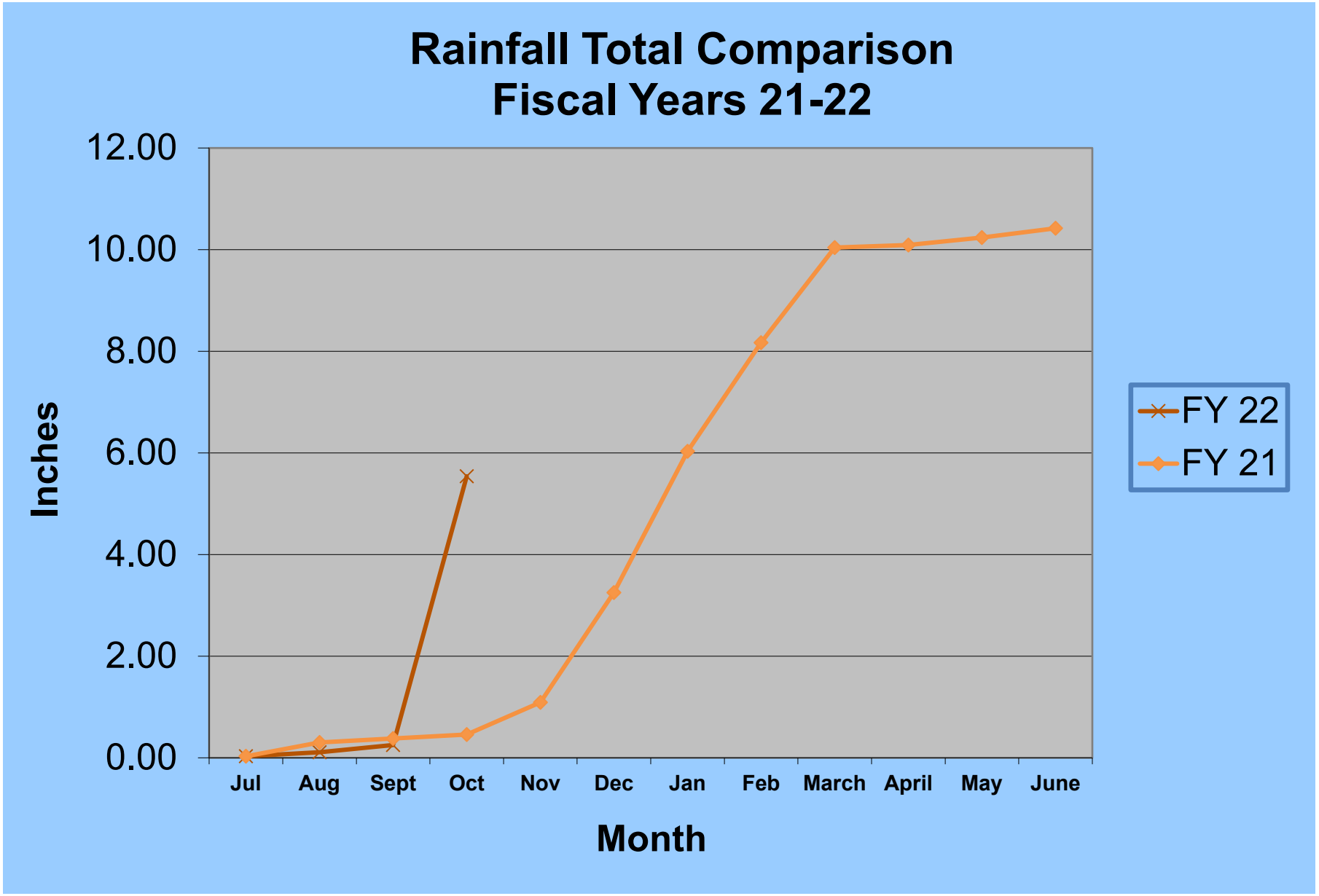
Coastside County Water District
766 Main Street
July 2021 - June 2022

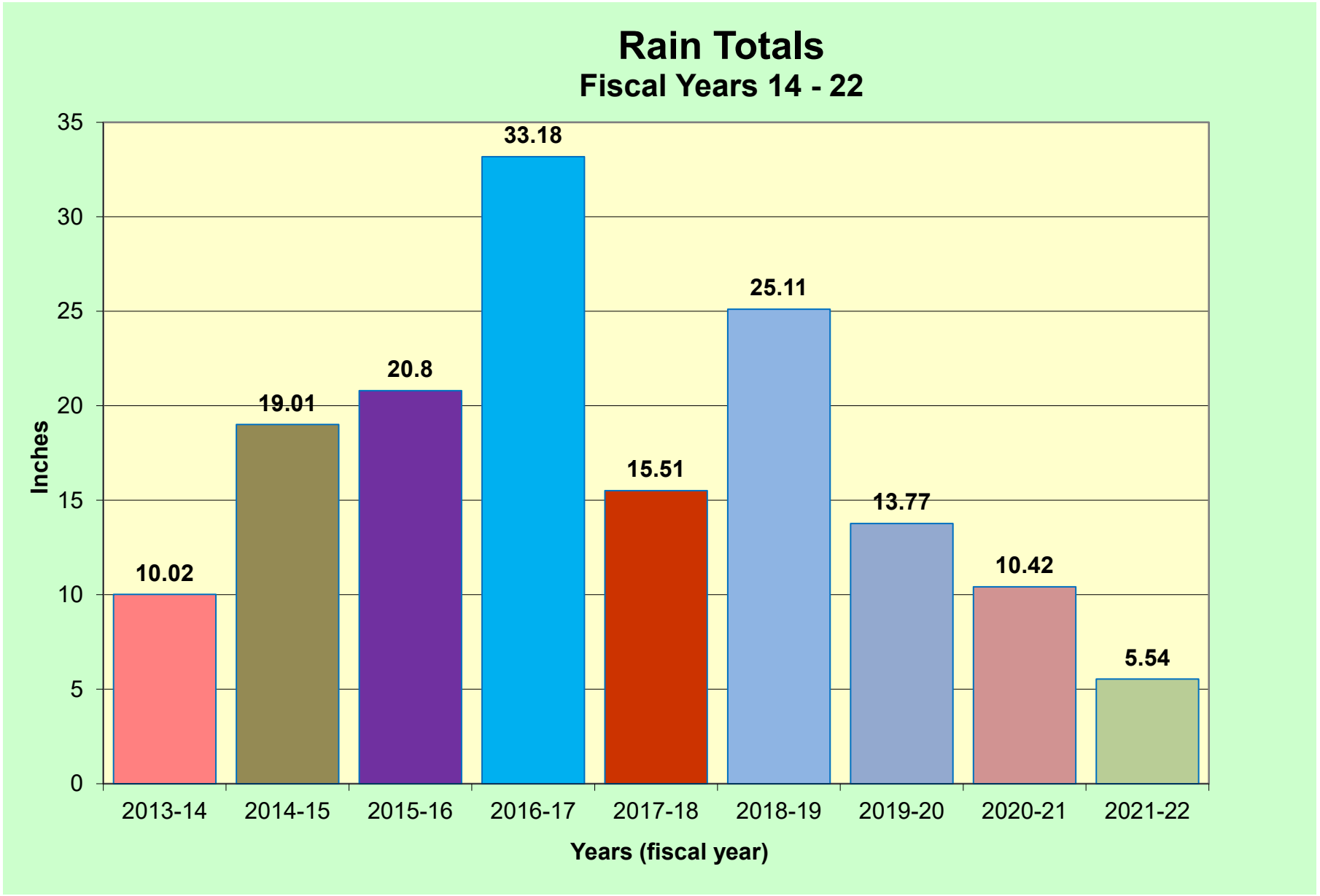
Nunes
Rainfall in Inches

	2021				2022							
	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
1	0	0	0	0								
2	0	0	0	0								
3	0	0	0	0								
4	0	0.02	0	0								
5	0	0.02	0	0								
6	0	0	0	0								
7	0	0.02	0	0.01								
8	0	0.01	0	0								
9	0	0	0	0								
10	0	0	0	0								
11	0	0	0	0								
12	0	0	0	0								
13	0	0	0	0								
14	0	0	0	0								
15	0	0	0	0								
16	0	0	0	0								
17	0	0	0	0								
18	0	0	0.04	0.05								
19	0	0	0.01	0								
20	0.01	0	0	0.03								
21	0	0	0	1.08								
22	0	0	0	1.07								
23	0.02	0	0	0								
24	0	0	0.01	0.94								
25	0	0	0	2.08								
26	0	0	0.01	0.01								
27	0	0	0.06	0								
28	0	0	0.01	0								
29	0	0.01	0	0								
30	0	0	0	0								
31	0	0		0.02								
Mon.Total	0.03	0.08	0.14	5.29								
Year Total	0.03	0.11	0.25	5.54								

Coastside County Water District




Rainfall Total Comparison
Fiscal Years 21-22
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Inches
Jul
Aug
Sept
Oct
Nov
Dec
Jan
Feb
March
April
May
June
Month
FY 22
FY 21


Rain Totals
Fiscal Years 14 - 22
Inches
35
30
25
20
15
10
5
0
10.02
19.01
20.8
33.18
15.51
25.11
13.77
10.42
5.54
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
Years (fiscal year)

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Date: **October 28, 2021**

Subject: **Acceptance of Non-Complex Pipeline Extension Project**
477 3rd Avenue - Rita & Stephen Semprevivo

Recommendation:

Accept the water system improvements for the Non-Complex Pipeline Extension Project at 477 3rd Avenue, unincorporated area of Miramar as complete.

Background:

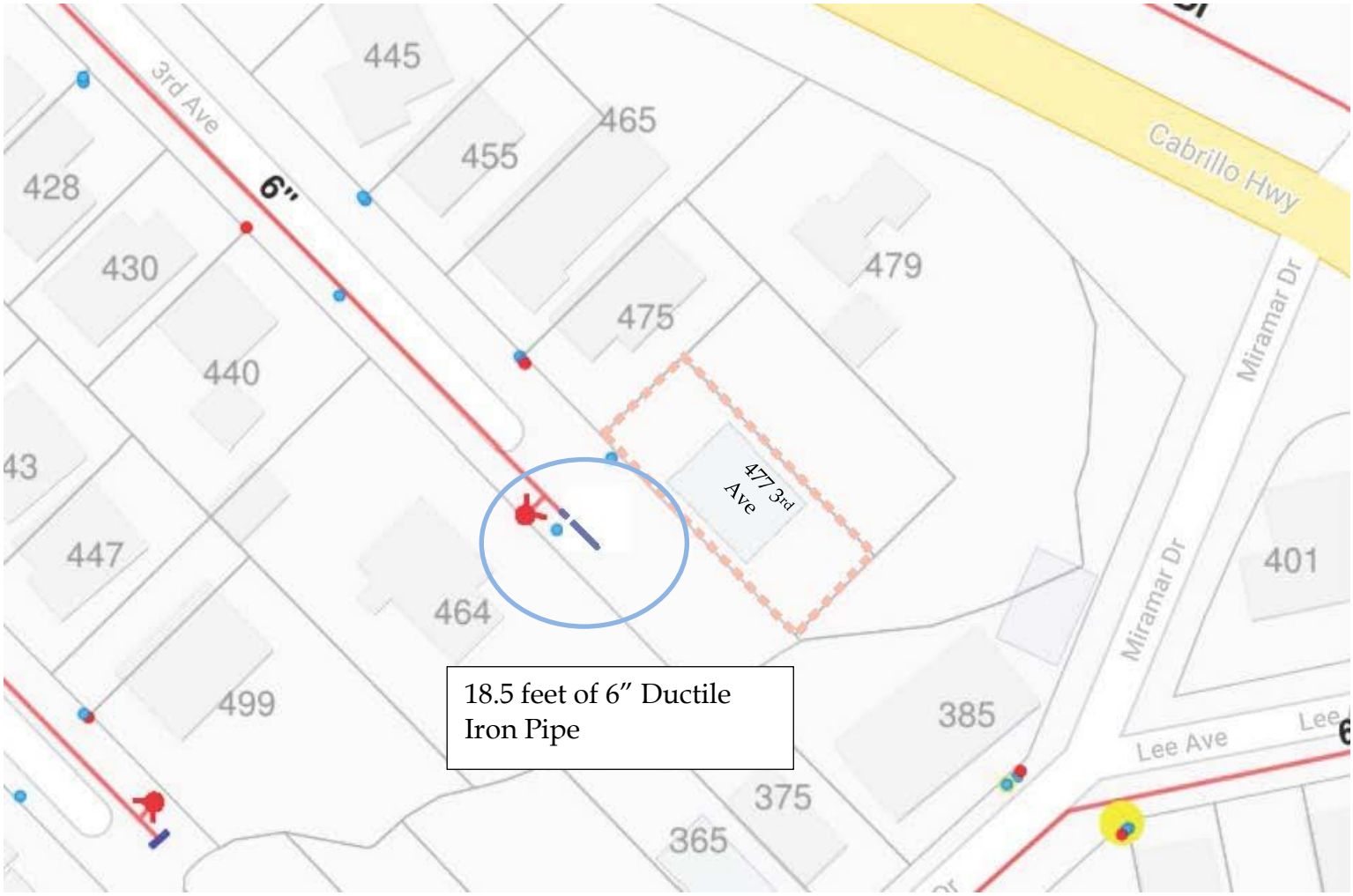
A non-complex pipeline extension project for 477 3rd Avenue, unincorporated area of Miramar was completed on 10/12/2021.

The District accepts the project utility system according to the conditions listed below:

- √ That the Project Utility System was constructed in accordance with the district regulations.

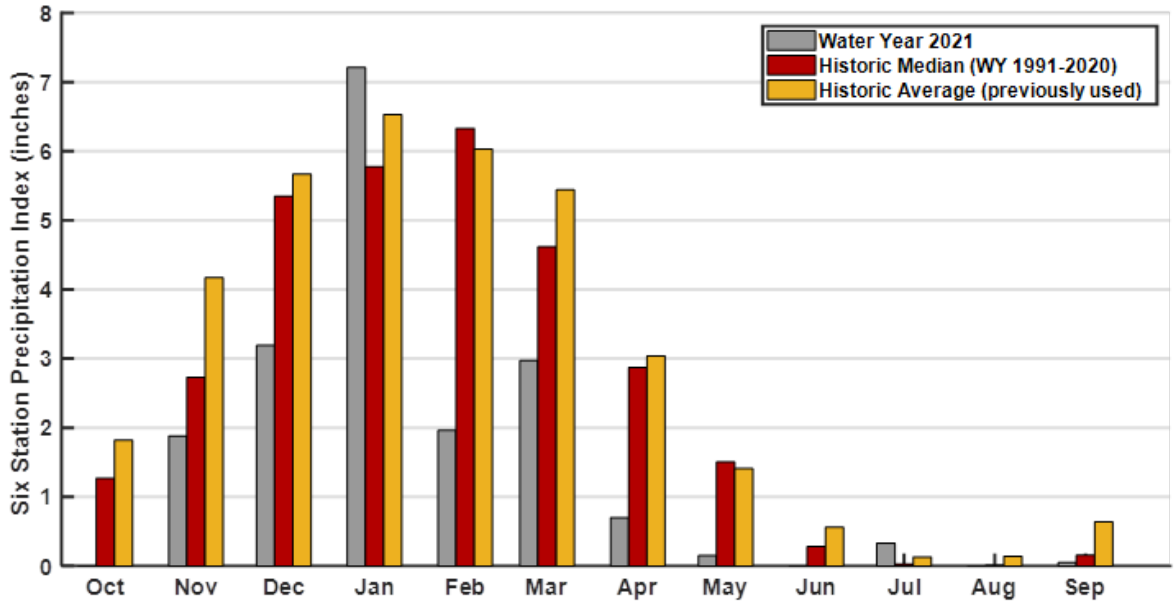
- √ All costs for the construction of the Project have been borne by the applicant. No outstanding fees are due at this time.

Fiscal Impact: None.


3rd Ave
6"
445
465
455
428
430
479
475
440
43
447
464
499
385
375
365
401
Cabrillo Hwy
Miramar Dr
Miramar Dr
Lee Ave
Lee
477 3rd Ave
18.5 feet of 6" Ductile Iron Pipe

San Francisco Public Utilities Commission
Hydrological Conditions Report
September 2021

J. Chester, C. Graham, N. Waelty, October 15, 2021



Starting WY2022 the San Francisco Public Utilities Commission (SFPUC), including Hetch Hetchy Water and Power (HHWP), updated the long term medians to come into agreement with the National Oceanic and Atmospheric Administration (NOAA) use of thirty year Climate Normals. The current NOAA Climate Normal is 1991-2020 and is updated every ten years. As you can see in our example graph shown here our Historic Median Six Station Index rain plot has shifted slightly with February being the wettest as opposed to March in the previously used Historic Average (1957-1997).

System Storage

Current Tuolumne System and Local Bay Area storage conditions are summarized in Table 1.

Table 1
Current System Storage
as of October 1, 2021

	Current Storage		Maximum Storage		Available Capacity		Percentage of Maximum Storage
	acre-feet	millions of gallons	acre-feet	millions of gallons	acre-feet	millions of gallons	
Tuolumne System							
Hetch Hetchy Reservoir[1]	240,430		360,360		119,930		67%
Cherry Reservoir[2]	199,824		268,800		68,976		74%
Lake Eleanor[3]	19,871		21,495		1,624		92%
Water Bank	361,808		570,000		208,192		63%
Tuolumne Storage	821,933		1,220,655		398,722		67%
Local Bay Area Storage							
Calaveras Reservoir	53,730	17,508	96,824	31,550	43,093	14,042	56%
San Antonio Reservoir	43,083	14,039	50,496	16,454	7,413	2,415	85%
Crystal Springs Reservoir	51,086	16,646	58,377	19,022	7,291	2,376	88%
San Andreas Reservoir	15,357	5,004	18,996	6,190	3,639	1,186	81%
Pilarcitos Reservoir	1,501	489	2,995	976	1,494	487	50%
Total Local Storage	164,757	53,686	227,688	74,192	62,930	20,506	72%
Total System	986,690		1,448,343		461,652		68%

[1] Maximum Hetch Hetchy Reservoir storage with drum gates activated.
[2] Maximum Cherry Reservoir storage with flash-boards out.
[3] Maximum Lake Eleanor storage with flash-boards out.

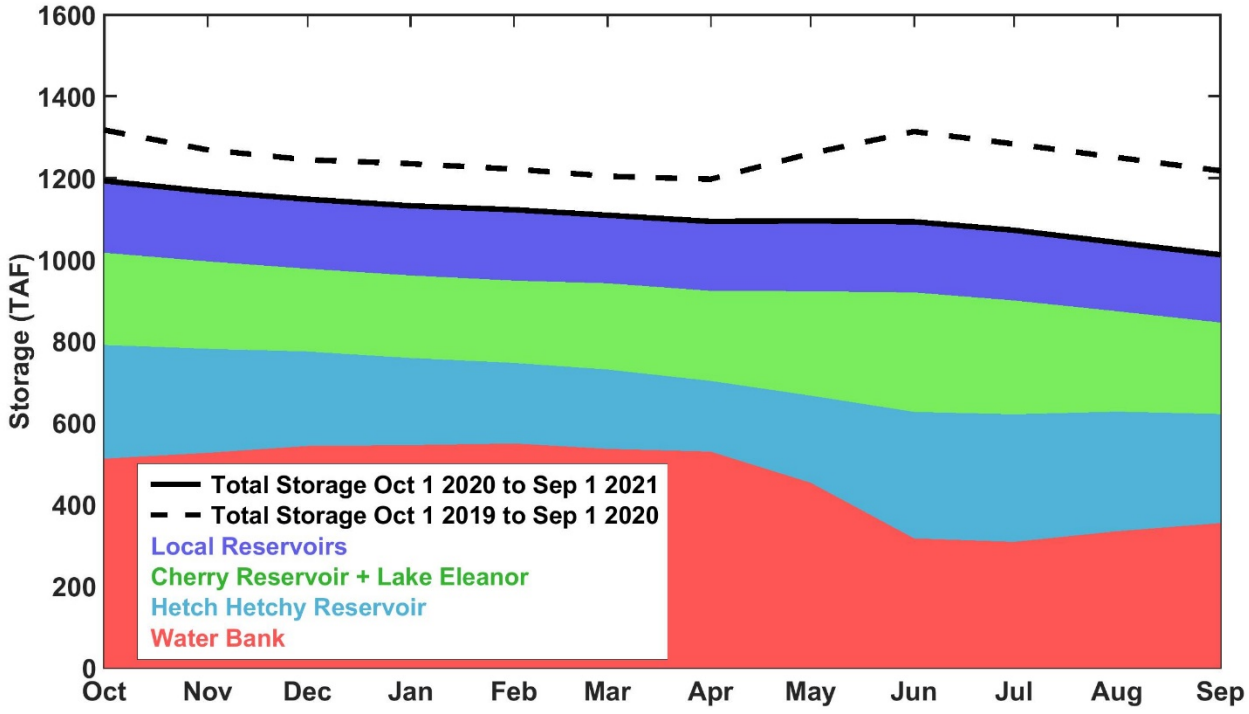


Figure 1: System storage for past 12 months in thousand acre-feet (TAF). Color bands show contributions to total system storage. Solid black line shows total system storage for the past 12 months. Dashed black line shows total system storage the previous 12 months.

Hetch Hetchy System Precipitation Index

Current Month: The September 2021 six-station precipitation index was 0.06 inches, or 17% of the average long-term index for the month. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

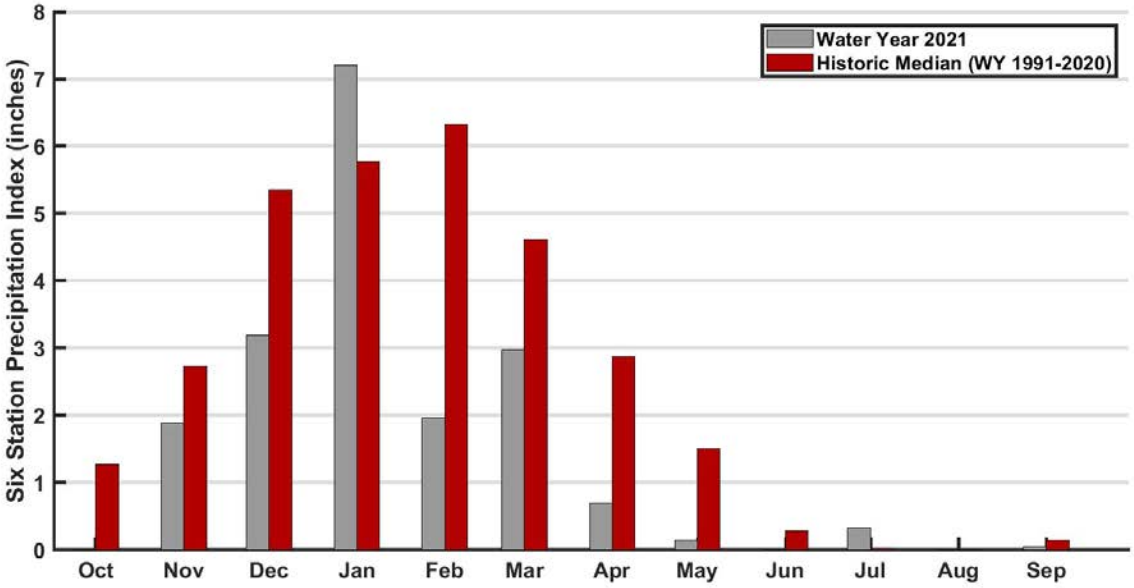


Figure 2: Monthly distribution of the six-station precipitation index relative to the monthly precipitation averages. The precipitation index is computed as the average of six Sierra precipitation stations and is an indicator of the overall basin wetness.

Cumulative Precipitation to Date: As of September 30, the six-station precipitation index for Water Year (WY) 2021 was 18.41 inches, which is 50% of the average annual water year total and the second driest in 91 years of record. The Hetch Hetchy Weather Station received 0.08 inches of precipitation in September resulting in a total of 19 inches for WY 2021, or 52% of average to-date. The cumulative WY 2021 Hetch Hetchy precipitation is shown in Figure 3 in red.

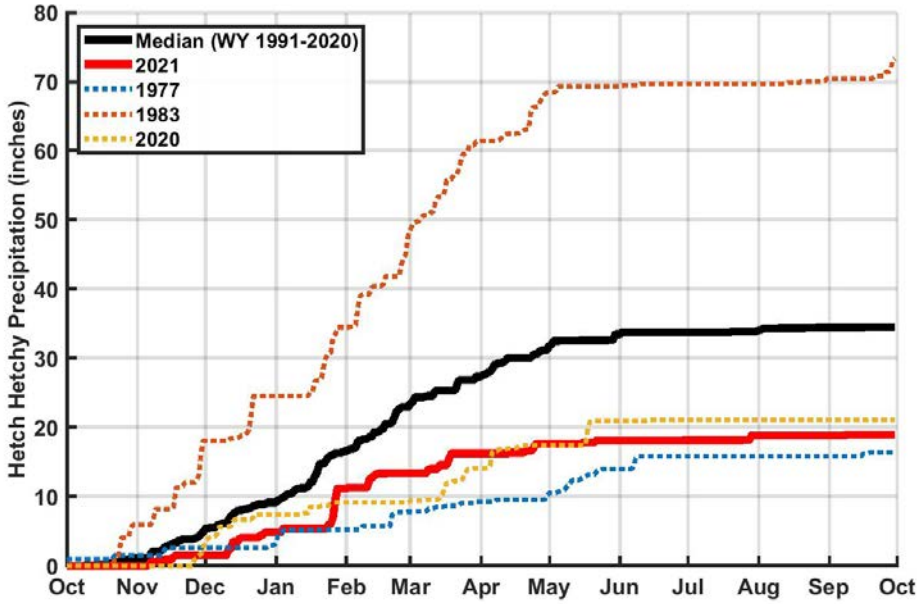


Figure 3: Water Year 2021 cumulative precipitation measured at Hetch Hetchy Weather Station. Median cumulative precipitation measured at Hetch Hetchy Weather Station and example wet and dry years are included with Water Year 2020 for comparison purposes.

Tuolumne Basin Unimpaired Inflow

Unimpaired inflow to SFPUC reservoirs and the Tuolumne River at La Grange for September 2021 and the water year to date is summarized below in Table 2.

Table 2
Calculated Reservoir Inflows and Water Available to City

* All flows are in acre-feet	September 2021				October 1, 2020 through September 30, 2021			
	Observed Flow	Median[1]	Mean[1]	Percent of Mean	Observed Flow	Median[1]	Mean[1]	Percent of Mean
Inflow to Hetch Hetchy Reservoir	0	1,669	3,314	0%	273,155	703,970	762,304	36%
Inflow to Cherry Reservoir and Lake Eleanor	0	1,537	1,969	0%	177,732	465,619	508,322	35%
Tuolumne River at La Grange	4,685	8,681	12,079	39%	611,290	1,664,299	1,942,410	31%
Water Available to City	0	0	5	0%	56,864	580,260	870,173	7%

[1]Hydrologic Record: 1991-2020

Hetch Hetchy System Operations

Hetch Hetchy Reservoir power draft and stream releases during the month totaled 26,412 acre-feet. Hetch Hetchy Reservoir minimum instream release requirements for September 1-14 were 75 cfs and decreased to 50 cfs for September 15-30. Total precipitation for Water Year 2021 has resulted in a Water Year Type C for Hetch Hetchy Reservoir. Hetch Hetchy Reservoir instream releases will decrease to 35 cfs for October and will remain 35 cfs through the end of the calendar year.

Cherry Reservoir valve and power draft releases totaled 2,202 acre-feet for the month and were used to maintain seasonal target elevations. The required minimum instream release from Cherry Reservoir for September was 15 cfs and will decrease to 5 cfs in October. Lake Eleanor required release for September 1- 15 was 20 cfs and decreased to 10 cfs for September 16 – October 31.

San Joaquin Pipeline average deliveries were 230 MGD for the month of September.

Regional System Treatment Plant Production

The Harry Tracy Water Treatment Plant average production rate for September was 9.22 MGD. The Sunol Valley Water Treatment Plant production for the month was 13 MGD.

Local System Water Delivery

The average September delivery rate was 214 MGD, which is a 2% decrease below the August delivery rate of 219 MGD.

Local Precipitation

The rainfall summary for September 2021 is presented in Table 3.

Table 3
Precipitation Totals at Three Local Area Reservoirs

Weather Station Location	September		October 1, 2020 through September 30, 2021	
	Total (inches)	Percent of Mean for the Month	Total (inches)	Percent of Mean for the Year-To-Date
Pilarcitos Reservoir	0.15	150%	18.96	56%
Lower Crystal Springs Reservoir	0.02	67%	11.97	54%
Calaveras Reservoir	0.00	0%	10.19	57%

*Mean Period = WY 1991-2020

Water Supply and Planned Water Supply Management

Hetch Hetchy Reservoir WY2021 inflows were the 4th driest on record (n=91) with a total of 273,445 acre-feet. For the April to July seasonal period, inflow totaled 232,378 acre-feet, the 5th driest on record.

The calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City are shown in Figure 5. For Water Year 2021, there was 56,864 ac-ft water available to the City, 7% of average. These flow volumes were well below the 50% of average precipitation that was observed at Tuolumne gauges. The discrepancy between precipitation and inflows has been attributed to the very dry soils held over from the previous dry year 2020. Those dry soils are expected going into the fall, increasing expectations for a muted response to whatever hydrologic conditions are seen in WY 2022.

Hetch Hetchy Reservoir is drafting via SJPL deliveries and instream releases. Cherry Reservoir is drafting with instream releases and no scheduled generation at Holm Powerhouse. Lake Eleanor is drafting with instream release. Water Bank is increasing slightly as upcountry releases exceed full natural flows. Storage at all upcountry reservoirs will be maximized going into the winter season.

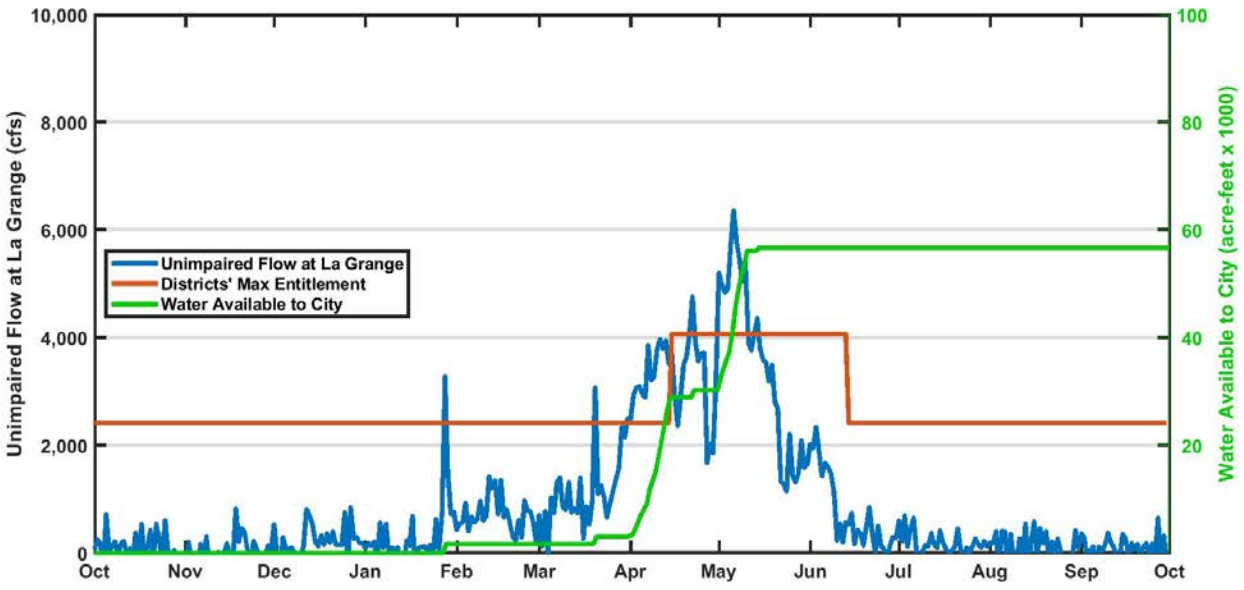


Figure 5: Calculated unimpaired flow at La Grange and the allocation of flows between the Districts and the City.

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Report Date: **November 5, 2021**

Subject: **Water Line Replacement Under Pilarcitos Creek at Strawflower Village Project – Adoption of the Initial Study/Mitigated Negative Declaration and the Mitigation Monitoring and Reporting Program**

Recommendation:

Approve Resolution No. 2021-07 (Exhibit A) Adopting an Initial Study/Mitigated Negative Declaration (IS/MND) and Mitigation Monitoring and Reporting Program (MMRP) for the Water Line Replacement Under Pilarcitos Creek at Strawflower Village Project.

Background:

An existing 8-inch pipeline crosses under Pilarcitos Creek north to south from the Strawflower Village Shopping Center to the intersection of Pilarcitos Avenue and Oak Avenue. The existing 8-inch pipeline crossing beneath the creek is one of only two pipelines supplying water to areas of the District south of the creek, including downtown Half Moon Bay. The existing pipe is approaching the end of its useful life and a break underneath the creek bed would impair water delivery and could potentially damage the environment. A break in the water line would be difficult to detect, could cause potentially significant water loss, impair water quality, and cause liability to the District with potential fines from the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), or California Department of Fish and Wildlife (CDFW). The District completed an initial phase of water line replacement work in June 2017 that consisted of installing approximately 400 ft of 8-inch pipe within the Strawflower access road from SR-1 that ensures water supply to commercial customers in the event of a problem with the existing pipe under the creek.

In 2016, the District considered and prepared a preliminary design to attach a new replacement water line to an existing pedestrian bridge, which is owned and maintained by the City of Half Moon Bay (City). Ultimately, the District decided instead to pursue a project that crossed under the creek using horizontal direction drilling (HDD), further described below. This trenchless construction method would minimize potential impacts to the creek.

This staff report summarizes the Project, the preparation of the Initial Study/Mitigated Negative Declaration (IS/MND), Comments received from interested parties and stakeholders, and the District's responses to address concerns raised in the comments.

EKI Environment & Water, Inc. ("EKI") is the Design Engineer on the project. WRA Environmental Consultants ("WRA") managed the CEQA work resulting in the Final ISMND document. Jon Sutter from EKI and John Baas from WRA will present at the November 9, 2021 Board meeting and will be available to answer questions.

The Project:

The Project will install a pipeline using HDD under the creek from the Strawflower Village Shopping Center to Oak Avenue through private property in a new easement. The approximately 450-foot section crossing under the creek will be nominal 10-inch diameter (8-inch nominal inner diameter) high-density polyethylene (HPDE) pipe. The remaining 190 linear feet of 8-inch ductile iron pipe will be installed by open trench construction to connect the 10-inch HDPE crossing to the existing 8-inch ductile iron pipeline that runs behind the Safeway north of the creek and the existing 8-inch cast iron pipe at the intersection of Oak Avenue and Pilarcitos Avenue south of the creek.

Staging areas will be located in the back of the shopping center behind Safeway and in Oak Park extending down Pilarcitos Avenue to the south. The HDD drill rig and ancillary equipment will be located behind the Safeway. The HDPE pipe will be staged and assembled along Pilarcitos Avenue.

Initial Study/Mitigated Negative Declaration Preparation:

The District retained WRA Environmental Consultants to prepare an environmental document evaluating the impacts of the project as mandated by the California Environmental Quality Act (CEQA). The District, as lead agency, released the IS/MND for a 60-day public review and comment period that began on August 5, 2021, and ended on October 4, 2021, pursuant the CEQA Guidelines Section 15105. The IS/MND and supporting documents were made available on the District's website, at https://www.coastsidewater.org/ and CEQAnet, the State Clearinghouse website (2021080099).

CEQA Guidelines require Lead Agencies to adopt a program for monitoring the mitigation measures required to avoid the significant environmental impacts of a project. This Mitigation Monitoring and Reporting Program (MMRP) was developed in October, 2021 (after the comment period closed) and ensures that mitigation measures imposed by the District are completed at the appropriate time in the development process. The mitigation measures identified in the IS/MND for the Water Line Replacement under

Pilarcitos Creek at Strawflower Village Project are listed in this MMRP along with the party responsible for monitoring implementation of the mitigation measure, the milestones for implementation and monitoring, and a signoff that the mitigation measure has been implemented. (See Appendix D of the IS/MND for the MMRP.)

Initial Study/Mitigated Negative Declaration Comments

The District received the following comments from the California Coastal Commission and the City of Half Moon Bay Planning Division on the ISMND:

- The California Coastal Commission is in support of the proposed mitigation measures that would protect the creek habitat, including the frac-out protocols.

- The City of Half Moon Bay comments fall within three categories:
    - Update references to the 1993 Local Coastal Plan (LCP) to the 2020 LCP.
        - Response: All references to the 1993 LCP have been updated to the 2020 LCP in the Final IS/MND.

    - Creating detours for access along Oak Avenue is not feasible because Oak Avenue is a dead-end street. Other access to Oak Avenue needs to be considered.
        - Response: The project would maintain a 20-foot road width on Oak Avenue during project construction.

    - Some impact statements and mitigation measures require substantial evidence to support the conclusions, including Air Quality (AQ), Greenhouse Gas (GHG) Emissions, Noise, Biological Resources.
        - Response:
            - AQ and GHG Emissions: Specific published exemptions provided by the Bay Area Air Quality Management District that would apply to the project have been incorporated into the Final IS/MND as substantial evidence.
            - Noise: Clarification regarding the City of Half Moon Bay's construction related noise standard has been added to the Final IS/MND. Any references to noise attenuation from use of physical barriers have been deleted in the Final IS/MND.
            - Biological Resources: Additional information about magnitude of the impact from a possible frac-out has been added into the Final IS/MND, including measurable standards for the frac-out mitigation measure (MM BIO-3).

The Final IS/MND Appendix C includes a summary of the original comments with responses to each individual comment specifying revisions to the document and mitigation measures in response to the comments.

The District provided a preview copy of the Final Document and Responses to Comments to the City of Half Moon Bay, and the District received an e-mail noting that there were no further comments.

Recommended Action

The attached Resolution reviews the CEQA process outlined above and specifies the findings necessary for the Board to adopt the Final Initial Study/ Mitigated Negative Declaration for the Water Line Replacement Under Pilarcitos Creek at Strawflower Village Project and the Mitigation Monitoring Reporting Plan. Staff recommends that the Board approve the Resolution.

Note: Due to the size of the Final IS/MND Report, please access the report in its entirety at:

https://www.coastsidewater.org/public-notices/CCWD-Pilarcitos-Creek-Final-Initial-Study-Mitigated-Negative-Declaration-October-2021.pdf

Resolution 2021-07

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE COASTSIDE COUNTY WATER DISTRICT ADOPTING AN INITIAL STUDY/MITIGATED NEGATIVE DECLARATION AND THE MITIGATION MONITORING AND REPORTING PROGRAM FOR THE WATER LINE REPLACEMENT UNDER PILARCITOS CREEK AT STRAWFLOWER VILLAGE PROJECT

WHEREAS, the Coastside County Water District ("District") has prepared an Initial Study and proposed Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program evaluating the possible environmental effects of the proposed Water Line Replacement Under Pilarcitos Creek at Strawflower Village Project ("Project"); and

WHEREAS, the proposed Project, described more fully in the attached Staff Report, is located in Half Moon Bay, California, and will include installing a pipeline using HDD under the creek from the Strawflower Village Shopping Center to Oak Avenue through private property in a new easement. The approximately 450-foot section crossing under the creek will be nominal 10-inch diameter (8-inch nominal inner diameter) high-density polyethylene (HPDE) pipe. The remaining 190 linear feet of 8-inch ductile iron pipe will be installed by open trench construction to connect the 10-inch HDPE crossing to the existing 8-inch ductile iron pipeline that runs behind the Safeway north of the creek and the existing 8-inch cast iron pipe at the intersection of Oak Avenue and Pilarcitos Avenue south of the creek.

WHEREAS, the Initial Study and proposed Mitigated Negative Declaration concluded that the Project's effects can be mitigated to the extent that the Project would not have a significant effect on the environment; and

WHEREAS, the District published a notice of the availability of the Initial Study and proposed Mitigated Negative Declaration on August 5, 2021, and invited comments thereon until October 4, 2021; and

WHEREAS, written comments were received by the District during the public review period and the District prepared a revised Initial Study and proposed Mitigated Negative Declaration and a Mitigation Monitoring and Reporting Program based on the comments received; and

WHEREAS, the Board of Directors of the District has reviewed the Initial Study and proposed Mitigated Negative Declaration including the Mitigation Monitoring and Reporting Program, considered all comments received and analyzed the need for the proposed project; and

NOW, THEREFORE, it is resolved by the Board of Directors of the Coastside County Water District as follows:

1. The Board of Directors hereby finds and declares that, based upon its independent judgment following review of the Initial Study and proposed Mitigated Negative Declaration and the Mitigation Monitoring and Reporting Program and consideration of the record of the Project as a whole, including any public comments, there is no substantial evidence before the District that the proposed Project will have a significant effect upon the environment; and

2. The Board of Directors finds that the Project will not have a significant effect on the environment and therefore adopts the Mitigated Negative Declaration and the Mitigation Monitoring and Reporting Program; and

3. The Board specifies that the Secretary of the District is the custodian of the documents and other materials that constitute the record of proceedings upon which the decision to adopt the Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program is based, and that such documents will be located at the District's business office located at 766 Main Street, Half Moon Bay, California 94019; and

4. The General Manager is directed to file a Notice of Determination promptly with the County Clerk of San Mateo County and the State CEQA Clearinghouse; and

5. The Board directs the General Manager to promptly file an application for a Coastal Development Permit with the City of Half Moon Bay.

PASSED AND ADOPTED this 9th of November, 2021, by the following votes of the Board of Directors:

AYES:

NOES:

ABSENT:

_____

Glenn Reynolds, President
Board of Directors

ATTEST:

_____

Mary Rogren, General Manager
Secretary of the Board of
Directors

<u>Final</u> Initial Study/Mitigated Negative Declaration

Water Line Replacement Under Pilarcitos Creek at Strawflower Village

<u>Lead Agency and Applicant</u>

Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019
Contact: Mary Rogren

~~Public Review Draft | August~~ <u>October</u> 2021

<u>Final</u> Initial Study/Mitigated Negative Declaration

Water Line Replacement Under Pilarcitos Creek at Strawflower Village

<u>Lead Agency and Project Applicant</u>

Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019
Contact: Mary Rogren

<u>CEQA Consultant</u>

WRA, Inc.
2169-G East Francisco Blvd
San Rafael, CA 94901
Contact: John Baas

~~**Public Review Draft | August**~~ **<u>October</u> 2021**

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ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

APE	Area of Potential Effects
BAAQMD	Bay Area Air Quality Management District
bgs	Below ground surface
BMP	Best Management Practices
BTU	British thermal unit
Cal Fire	California Department of Forestry and Fire Protection
Caltrans	California Department of transportation
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife (formerly California Department of Fish and Game [CDFG])
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CFGC	California Fish and Game Code
City	City of Half Moon Bay
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
Corps	United States Army Corps of Engineers
CUSD	Cabrillo Unified School District
CWA	Clean Water Act
dBA	A-weighted decibel scale
District	Coastside County Water District
DIP	Ductile iron pipe
DTSC	California Department of Toxic Substances Control
EECAP	Energy Efficiency Climate Action Plan
EKI	EKI Environment & Water, Inc.
EPA	U.S. Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
FESA	Federal Endangered Species Act
ft	Feet
GHG	Greenhouse gas
HDD	Horizontal directional drilling

HDPE	High-density polyethylene
L_{eq}	Equivalent energy noise level
LCP	Local Coastal Program
LOS	Level of service
LUP	Land Use Plan
MGD	Million gallons per day
MND	Mitigated Negative Declaration
MRP	Municip~~i~~al Regional Stormwater NPDES Permit
NAHC	Native American Heritage Commission
NAAQS	National Ambient Air Quality Standards
NWIC	Northwest Information Center
OHWM	Ordinary High Water Mark
PDR	Preliminary Design Report
ROW	Right-of-way
RWQCB	Regional Water Quality Control Board
~~7~~SR-1	Highway 1
SRA	State Responsibility Area
SWRCB	State Water Resources Control Board
TOB	Top of Bank
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VHFHSZ	Very High Fire Hazard Severity Zone
WPCP	Water Pollution Control Plan
WRA	WRA, Inc.

1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 BACKGROUND

1. **Project Title:** Water Line Replacement under Pilarcitos Creek from Oak Avenue to Strawflower Village

2. **Lead Agency and Project Applicant:** Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019

3. **Contact Person and Phone Number:** Mary Rogren – General Manager
(650) 726-4405
mrogren@coastsidewater.org

4. **Project Location:** City of Half Moon Bay, west of State Route 1 (SR-1) between Oak Avenue and Strawflower Village Shopping Center

5. **Parcel Numbers:** 056-300-150
056-300-210
056-141-950
056-141-970
056-040-999

1.2 PROPOSED PROJECT DESCRIPTION

Surrounding Land Uses and Setting

The proposed Project Area is located west of downtown Half Moon Bay (Figure 1) near an existing pedestrian bridge that crosses Pilarcitos Creek from San Mateo Road to the intersection of Pilarcitos Avenue and Oak Avenue south of the creek. Pilarcitos Creek is a coastal stream which extends approximately 14 miles from its headwaters in the western Santa Cruz Mountains through Pilarcitos Canyon and terminates in the Pacific Ocean at Half Moon Bay State Beach.

The north end of the proposed Project Area is on private property in the paved parking lot behind the Safeway store in the Strawflower Village shopping center (Figure 2). The south end of the proposed Project Area is in Oak Park along the north side of Oak Avenue, in the flat-lying, grassy area east of the bathroom and playground facilities. The park and the parcels include the creek riparian zone which are owned by the City of Half Moon Bay (City). Highway 1 (SR-1) is located approximately 350 ft east of the proposed Project Area, and multifamily residential housing occupy the areas to the south and west of the site.

Description of Project

The Coastside County Water District (District) is proposing to replace the water line under Pilarcitos Creek. The approximately 450-foot (ft)-long new pipeline would be installed using horizontal directional drilling (HDD) under the creek from the Strawflower Village Shopping Center to Oak Avenue, with staging areas in the back of the shopping center and in Oak Park extending down Pilarcitos Avenue to the south. The District is serving as the Project Applicant and California Environmental Quality Act (CEQA) Lead Agency.

Purpose and Need

The existing 8-inch pipeline crossing beneath the creek is one of only two pipelines supplying water to areas of the District south of the creek, including downtown Half Moon Bay. The existing pipe has reached the end of its useful life and a break underneath the creek bed would impair water delivery and could potentially damage the environment. A break in the water line would be difficult to detect, could cause potentially significant water loss, impair water quality, and cause liability to the District with potential fines from the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), or California Department of Fish and Wildlife (CDFW). The District completed an initial phase of water line replacement work in June 2017 that consisted of installing approximately 400 ft of 8-inch pipe within the Strawflower access road from SR-1 that ensures water supply to commercial customers in the event of a problem with the existing pipe under the creek.

Background

In 2016, the District considered attaching the new water line to the existing pedestrian bridge, which is owned and maintained by the City. Ultimately, the District decided instead to pursue HDD under the creek. This trenchless construction method would avoid potential impacts to the creek.

EKI Environment & Water, Inc. (EKI) prepared a Preliminary Design Report (PDR) for the proposed Project (EKI 2020) for the District to evaluate the feasibility of installing the new pipeline under the creek via HDD (Figure 3). Much of the Existing Conditions and Project Components sections that follow are based on the PDR.

Proposed Project Location and Size

The proposed Project is in the City of Half Moon Bay, San Mateo County, California, and would include portions of the Strawflower Village shopping center parking lot (APN 056-300-150) and Oak and Pilarcitos Avenues, as well as portions of the following APNs, adjacent to Pilarcitos Creek: 056-300-210, 056-040-999, 056-141-970 (Oak Avenue Park), and 056-141-950. The proposed Project is within Section 29 of Township 5 South, Range 5 West of the Mount Diablo Base and Meridian, as depicted in the Half Moon Bay U.S. Geological Survey (USGS) 7.5-minute topographic map. Specifically, the proposed Project Site consists of approximately 0.81 acres, including surface areas directly above the HDD pipeline as well as areas for staging and equipment laydown. APN 056-141-970 (Oak Avenue Park) is owned by the City, and all other portions of the proposed Project Area are either within utility easements or public road right-of-way (ROW).

Existing Conditions

The north end of the proposed creek crossing is on private property in the paved parking lot behind Safeway in the Strawflower Village shopping center. This parking lot is not heavily used due to its location behind the store. The parking lot is accessible from the east directly from San Mateo Road through the Strawflower Access Road, west of SR-1. The asphalt concrete surface across the parking lot is essentially flat. Thick, overgrown vegetation associated with Pilarcitos Creek riparian zone borders the parking lot to the south and west.

The south end of the proposed crossing is in Oak Park along the north side of Oak Avenue. The flat, grassy area is east of the bathroom and playground facilities near the pathway to the pedestrian bridge that crosses the creek to Strawflower Village. ~~This p~~Oak Park and the parcels in the creek riparian zone are owned by the City.

The existing ground surface elevations in the Project Area range between 42 ft on the north side and about 44 ft on the south side of the proposed crossing. The creek bed near the proposed centerline of the proposed crossing is ranges between elevations 27 and 29 ft.

Geologic maps describe subsurface soils encountered in the proposed Project Area as generally alluvial fan and stream terrace deposits (NRCS 2014). Geotechnical investigations conducted as part of the preliminary Project design observed very stiff to hard clay with sand to sandy clay to a depth of about 12 ft below ground surface (bgs) underlain by medium dense clayey sand to a depth of about 20 ft bgs. Underlying those soils are stiff lean clay to clayey silt to a depth of about 24.5 ft bgs and medium dense to dense clayey sand to very stiff sandy lean clay to a depth of about 27.5 ft bgs. Alternating layers of stiff clay and dense to very dense clayey sand and clayey sand with gravel are present to at least 50 ft bgs.

New Pipe Installation

HDD is a trenchless construction method whereby a pipe is installed in an arcing drill path to pass under a conflicting feature, such as Pilarcitos Creek (Figure 3 and Figure 4). HDD is typically a three-phase process. The first phase involves setting up a drill rig on one side of the crossing, in this case to the north behind the Safeway building, and drilling a pilot hole from a small entry pit in front of the rig. The entry pit contains drilling fluids. The bore begins with a vertical tangent to quickly gain depth, then arcs into a horizontal section under the creek, before following an upward path to the exit point. Another small pit at the exit point contains fluids to facilitate the reaming and pullback operations.

The second phase involves enlarging the pilot hole using reaming equipment to expand the diameter of the hole required for pipeline pullback, typically 1.5 times the pipe diameter. The larger borehole allows for the flow of drilling fluids around the pipe to reduce friction so the pipe can be pulled through. The pipe is delivered in sections, then butt-fused together so it is fully assembled before pullback begins. This process necessitates the large linear layout area along Pilarcitos Avenue.

The third phase involves pulling back the fully assembled pipe through the enlarged hole from the exit point back to the drill rig at the entry pit. Pullback is typically completed without interruption. Drilling mud, typically a mixture of water and bentonite or polymer, is used to remove the soil cuttings, support the walls of the borehole, and cool the cutting tools. Mixing systems are used to mix the drilling fluid additives with water to achieve the fluid properties appropriate for the site-specific geology. Separation plants are used to remove soil cuttings and recycle drilling fluids. All fluids are contained at the entry and exit pits. Spill facilities and equipment are stationed nearby to e~~i~~nsure on-site fluid containment.

The new pipe would be sized to match the 8-inch inner diameter of the existing piping. The new pipe would be somewhat flexible, high-density polyethylene (HDPE). The pipe's working pressure would be approximately 100 pounds per square inch (psi) at the bottom of the proposed bore path (where pressure is the highest) and could accommodate increased working pressures up to approximately 150 psi. Because of the HDPE pipe thickness, a nominal 10-inch DR 11 HDPE would be used to meet the required 8-inch inner diameter and pressure class requirements.

For the open trench sections of the proposed Project that will connect the 10-inch HDPE crossing to the existing pipe on each side of the creek, 8-inch Class 52 ductile iron pipe (DIP) would be installed per the District's standards. HDPE adapters or mechanical joint fittings with the appropriate HDPE restraints would be used to connect the two pipe materials.

The new pipe would be installed with a 20-ft minimum depth of cover below the creek bed, equivalent to the depth of cover of the pipe previously installed as part of the District's El Granada Final Phase HDD crossing. This clearance below creeks was determined based on hydrofracture analysis (see the Preliminary Design Report, Appendix F) to minimize~~s~~ the chance for fracking out drilling fluid. A frac-out can happen

when drilling fluid escapes from the borehole to the surface, generally resulting in relatively small release of sediment-laden water into the surrounding environment before it is contained. Sediments would consist of bentonite clay.~~puddles of mud on the ground.~~ Should it occur, a frac-out could impact aquatic vegetation, benthic invertebrates, and special status species such as steelhead, California red-legged frog, San Francisco garter snake, or western pond turtle. Geotechnical experts have designed the HDD crossing to avoid frac-outs and frac-outs are unlikely, but contingency plans (such as portable containment and nearby vacuum trucks) are required in the event one occurs, to limit any potential environmental damage (see the Preliminary Design Report, Appendix F). The bore geometry also provides a depth of cover of approximately 15 ft below the lower sanitary sewer siphon that also crosses Pilarcitos Creek.

Open-trench construction on each side of the HDD crossing would connect to the existing 8-inch DIP water mains. The open trench sections would be Class 52 DIP, encased in polyethylene wrap, with a minimum 3 ft of cover per District standards. The connection north of the creek would be installed either by hot tap or cutting in a tee with a shutdown. The connection south of the creek would be installed by cutting in a new tee and valve cluster without loss of service.

The exit side open trench section would extend east on Oak Avenue to the existing 8-inch crossing near Pilarcitos Avenue. The new pipe would include valves and caps on each end along Oak Avenue to facilitate extending this line as part of the District's planned Pine Willow Oak Project. All water service laterals would remain connected to the existing 4-inch water main along Oak Avenue until the Pine Willow Oak Project is completed, at which point service laterals would be reconnected to the new 8-inch water main. The existing crossing would be cut and capped at each end and abandoned in place.

Project-related ground disturbance would only occur at the bore pits in developed and maintained park areas, which would be approximately 10 ft wide, 10 ft long, and 5 ft deep, and within the HDD alignment itself. The construction contractor would dispose of all materials off-site and out of the public ROW. No disposal or borrow sites would be part of the proposed Project.

Staging and Laydown Areas

A portion of Pilarcitos Avenue would be used as a laydown area to pre-fabricate the new pipe before pullback (Figure 4). Pilarcitos Avenue is a two-lane residential street with private residences located only on the west side. The east side of the street is undeveloped and does not contain any driveways between Oak Avenue and Willow Avenue (approximately 485 ft), so it is well suited for laying down and fabricating the pipe. An overhead electrical line runs along the east side of the street behind the back of walk.

An open-space conservation easement exists in Strawflower Shopping Center property (APN 056-300-150), which restricts development in the Pilarcitos Creek riparian zone and designates areas for permitted encroachments. The easement, however, explicitly exempts "the installation or repair of underground utility lines and septic systems" from the development restrictions. Vegetation removal would be limited to ornamental grass within the HDD exit pit at Oak Park.

Access

Access to and from the proposed Project Site for construction purposes would be via the local street network. Parking for worker vehicles would be either at the Safeway lot when working at the HDD Entry Staging Area or along Oak Avenue and Pilarcitos Avenue when working at the HDD Exit Staging Area or assembling the pipeline.

Utilities, Easements, and Rights-of-Way

The District would purchase permanent and temporary construction easements for the proposed Project. An encroachment permit with the City would also be required for the open trench section along Oak Avenue and the work area needed to fabricate the pipe string along Pilarcitos Avenue.

There are no overhead utilities in the proposed Project Area north of the creek. The District's existing 8-inch water main wraps around the Safeway in the parking lot to the Strawflower Access Road. A 2-inch gas main and 3-inch electrical conduit run between the District's water line and the Safeway building. The 2-inch gas main extends parallel to the proposed crossing for approximately 150 ft, before it bends east towards SR-1. The proposed crossing maintains a horizontal clearance from the gas main of at least 13 ft, but the exact location of the gas main would be verified by the contractor before construction. A 12-inch sanitary sewer owned by the City runs southeast behind the Safeway in the parking lot to a manhole located in the vegetated area south of Safeway. From this manhole, parallel 6-inch and 4-inch sanitary sewer siphons run south under the creek to a manhole located along the southern bank of the creek. The proposed Project would cross these siphons approximately 25 ft south of the manhole north of the creek. At the proposed crossing location, the upper 4-inch siphon is assumed to have approximately 6.25 ft of cover and the deeper 6-inch siphon is assumed to have 7.25 ft of cover based on work done as part of preliminary Project design. The siphons are exposed above grade on the southern side of the creek bed.

The south end of the proposed crossing is in Oak Avenue Park along the north side of Oak Avenue, in the flat-lying, grassy area east of the bathroom and playground facilities. This park and the parcels in the creek riparian zone are owned by the City. There are no known underground or overhead utilities in the area of the park at the south end of the proposed crossing. A paved walking path with three small bridges runs north of the grassy area adjacent to the creek vegetation. A wire fence borders the creek vegetation to the south, north of the path. Due to the density of the brush, the creek bed has very limited accessibility from the south.

The pipe on the south end that connects to the new crossing would be installed in an open trench south to Oak Avenue and east in the Oak Avenue ROW, where it would connect to the existing 8-inch water main at Pilarcitos Avenue. Oak Avenue consists of a two-lane street with parallel parking spaces along each side. The south side of the street (across from the park) is occupied by private residences. Oak Street utilities include: a 2-inch gas main runs along the northern back of walk; a 6-inch sanitary sewer runs along the centerline of the street; an existing 4-inch water main runs between the sanitary sewer and the southern edge of pavement; and an overhead electrical line runs behind the back of walk on the south side of the street and extends east across Pilarcitos Avenue.

Construction Schedule and Equipment

It is anticipated that construction of the proposed project would require approximately two months. Work would be conducted between the hours of 7 a.m. and 6 p.m. Monday through Friday, 8 a.m. to 6 p.m. on Saturdays, and 10 a.m. to 6 p.m. on Sundays and holidays unless otherwise approved in writing by the City of Half Moon Bay Director of Public Works/City Engineer. Equipment used during construction will include an excavator, drill rig, front loader, mud mixing plant, and separation plant as well as vehicles necessary for transportation of equipment and employees.

Proposed Project Operations

No additional operations are anticipated beyond the current level for the existing pipeline and would include periodic inspections and maintenance as needed.

1.3 BEST MANAGEMENT PRACTICES

The construction contractor will be responsible for complying with all terms of the contract specifications and drawings. Best Management Practices (BMPs) to be identified in the contract specifications and drawings include, but are not limited to the following:

1) Identify locations of all existing underground lines in the proposed alignment and take necessary precautions to avoid damaging the pipelines or interfering with their service.

2) Maintain utility services in the proposed Project Area at all times, except for short term outages during construction work hours approved in advance by the District.

3) Minimize discharge of materials in storm water in accordance with the District's Storm Water Management and Discharge Rules and Regulations.

4) Use traffic cones, signs, lighted barricades, lights, and flagmen as described and specified in the Manual of Uniform Traffic Control Devices, current edition, California Supplement, Part 6 Temporary Traffic Control to provide for public safety and convenience during construction.

5) Maintain convenient access to driveways and streets near the work area unless otherwise approved by the City in advance.

6) ~~Lane closure or traffic detours on City streets require prior approval of the City.~~ The City will need to grant permission for excavation in the streets, typically in the form of an Encroachment Permit.

7) Cover, fence, and guard, as appropriate, open excavation and ditches across roadways and pedestrian pathways in such a manner as to permit safe traffic and pedestrian flow during hours when no work is being performed and to prevent accidents from people or animals falling into the trenches.

8) Restore all street, parkland, and natural surfaces to pre-disturbance conditions or better.

The contractor will also implement measures during construction to maintain safety, minimize impacts from hazardous materials spills, maintain emergency access, protect water quality, cultural and biological resources, and prevent fires, including:

1) Follow all safety and health requirements set forth by the Occupational Safety and Health Administration.

2) Hazardous materials will not be stored or used, such as for equipment maintenance, where they could affect nearby properties, or where they might enter the storm drain system.

3) All spills of oil and other hazardous materials will be immediately cleaned up and contained. Any hazardous materials cleaned up or used on-site will be properly disposed of at an approved disposal facility.

4) The District or its contractor will notify and coordinate with law enforcement and emergency service providers prior to the start of construction to ensure minimal disruption to service during construction.

5) Adequate vehicular access will be maintained ~~Detours will be readily available at all times to allow emergency vehicles access~~ around the work area.

6) Prepare a site-specific Water Pollution Control Plan (WPCP) to limit erosion and protect water quality surrounding the proposed Project Area.

The Bay Area Air Quality Management District (BAAQMD) recommends BMPs to ensure minimal impacts on regional air quality. The contractor will be responsible for implementing the following basic measures during construction:

1) All exposed soil surfaces (e.g., parking areas, staging areas, soil piles, graded areas) will be watered two times per day.

2) All haul trucks transporting soil, sand, or other loose material off-site will be covered.

3) All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4) All roadways, driveways, and sidewalks to be paved will be completed as soon as possible.

5) Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]).

6) Clear signage will be provided for construction workers at all access points.

7) All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications, and all equipment will be checked by a certified visible emissions evaluator.

8) A publicly visible sign with the telephone number and person to contact at the lead agency regarding any dust complaints will be posted in or near the proposed Project Area. The contact person will respond to complaints and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.

1.4 OTHER PUBLIC AGENCIES WHOSE APPROVAL MAY BE REQUIRED

The information contained in this Initial Study will be used by the District (the CEQA Lead Agency) as it considers whether or not to approve the proposed Project. If the Project is approved, the Initial Study, as well as the associated Mitigated Negative Declaration (MND) would be used by the District and responsible and trustee agencies in conjunction with various approvals and permits. These actions include, but may not be limited to, the following approvals by the agencies indicated:

City of Half Moon Bay

- Encroachment Permit
- Grading Permit
- Utility Easement
- Coastal Development Permit

California Coastal Commission

- The California Coastal Commission (CCC) has the ability to review the Project through an appeal process, contingent on the City's approval of the Coastal Development Permit.

Path: L:\Acad 2000 Files\29000\29375\GIS\ArcMap\Fig1_Location_20210319.mxd

Sources: National Geographic, WRA | Prepared By: mweidenbach, 3/19/2021

Figure 1. Project and Staging Area Regional Location Map

Path: L:\Acad 2000 Files\29000\29375\GIS\ArcMap\Fig2_RipExtent_20210319.mxd

Sources: EKI, WRA | Prepared By: mweidenbach, 3/19/2021

Figure 2. Project Components

wra ENVIRONMENTAL CONSULTANTS

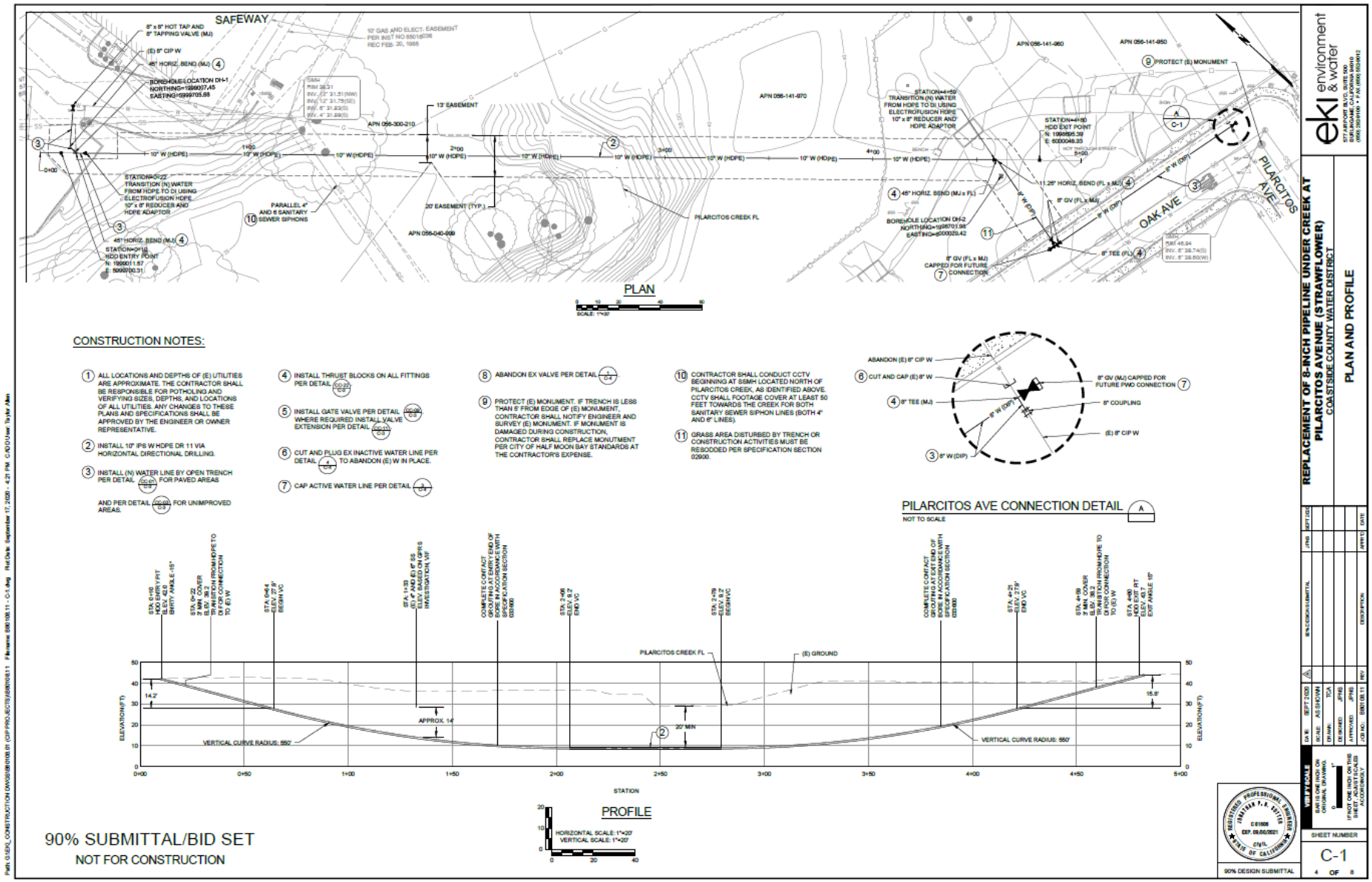

Figure 3. Site Plan and Profile

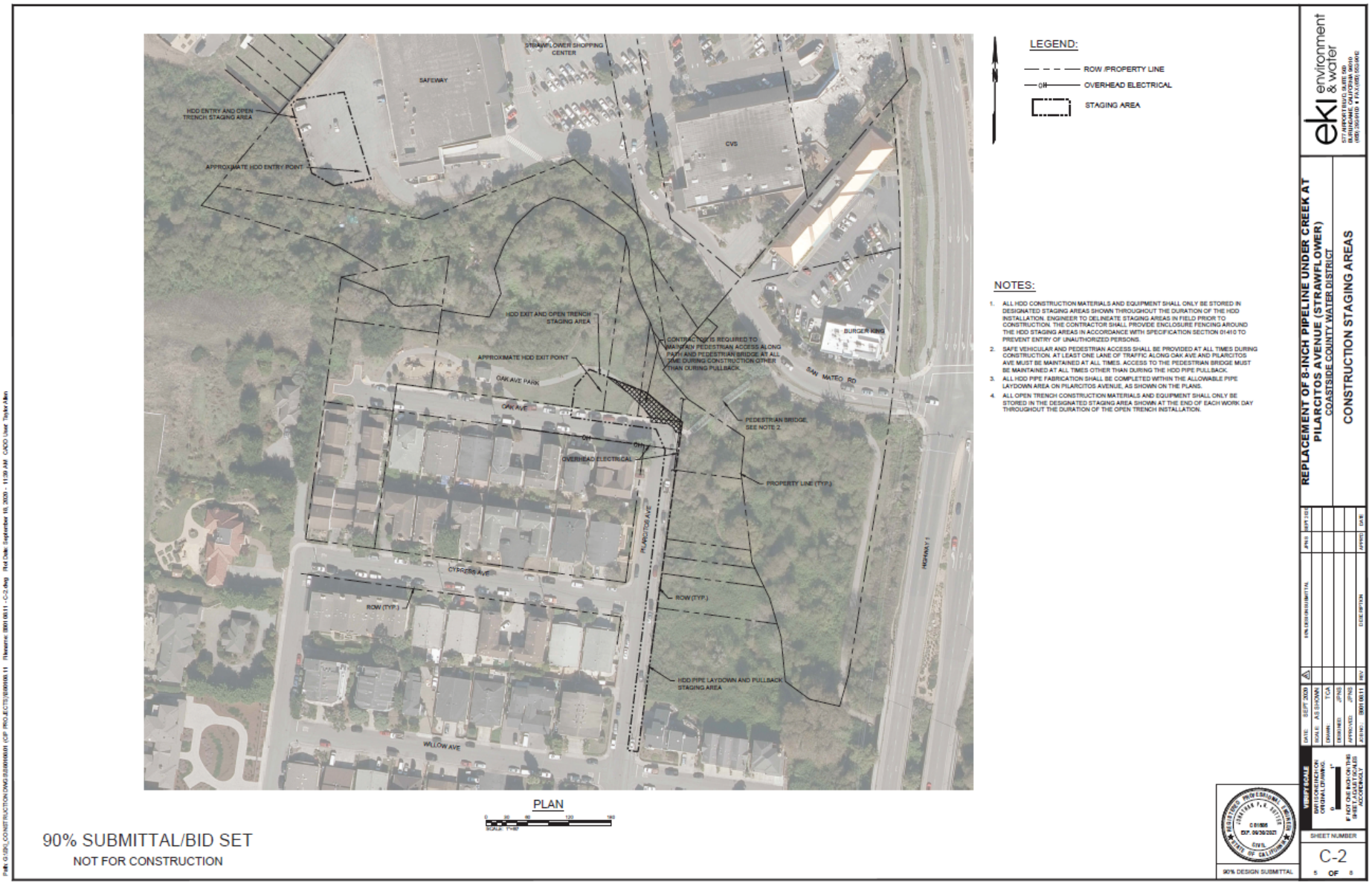

Figure 4. Construction Staging Areas

Photo 5a: Bore entry staging area (beyond fire hydrant) behind Safeway in the Strawflower Shopping Center.

Photo 5b: Access from San Mateo Road through Strawflower Center to Bore entry staging area (left of Safeway).

Photo 5c: Bore entry location and tie-in to existing water line (under Fire Hydrant).

Figure 5. Photos from Strawflower Center of HDD Bore Entry Area

Photo 6a: Looking East from pathway in Oak Park over HDD Pullback Staging Area (to right of pathway).

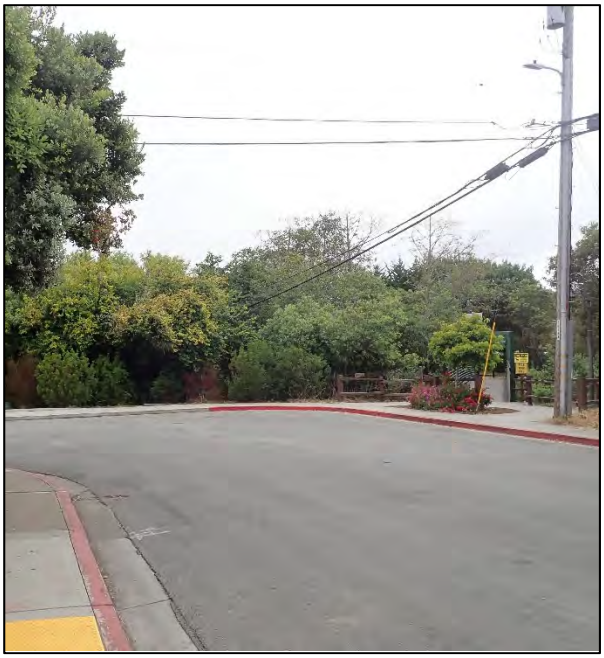

Photo 6b: Looking Northwest across Pilarcitos Avenue near Oak over the pipe layout area to the Pedestrian Bridge over Pilarcitos Creek.

Photo 6c: Looking South on Pilarcitos Avenue along proposed pipe layout area.

Figure 6. Photos from Oak Park of HDD Pipe Layout and Pullback Areas

Photo 7a: View west overlooking Pilarcitos Creek and the dense vegetation surrounding it.

Photo 7b: Northeast view into Bridge Entrance from Pilarcitos Avenue.

Photo 7c: Southwest view into Bridge Entrance from San Mateo Road

Figure 7. Photos of Pedestrian Bridge Over Pilarcitos Creek

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below (☒) would be potentially affected by this proposed Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Public Services
☐ Agriculture and Forestry Resources	☒ Hazards and Hazardous Materials	☐ Recreation
☐ Air Quality	☐ Hydrology/Water Quality	☒ Transportation
☒ Biological Resources	☐ Land Use/Planning	☒ Tribal Cultural Resources
☒ Cultural Resources	☐ Mineral Resources	☐ Utilities/Service Systems
☐ Energy	☒ Noise	☒ Wildfire
☐ Geology/Soils	☐ Population/Housing	☒ Mandatory Findings of Significance

3.0 DETERMINATION

3.0 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and in ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant" or "Potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier IER or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature Date

Mary Rogren, General Manager
Printed Name

4.0 INITIAL STUDY CHECKLIST

4.0 INITIAL STUDY CHECKLIST

This section describes the existing environmental conditions in and near the project area and evaluates environmental impacts associated with the proposed project. The environmental checklist, as recommended in the CEQA Guidelines (Appendix G), was used to identify environmental impacts that could occur if the proposed project is implemented. The right-hand column in the checklist lists the source(s) for the answer to each question. The cited sources are identified at the end of this section.

Each of the environmental categories was fully evaluated, and one of the following four determinations was made for each checklist question:

- "No Impact" means that no impact to the resource would occur as a result of implementing the project.
- "Less than Significant Impact" means that implementation of the project would not result in a substantial and/or adverse change to the resource, and no mitigation measures are required.
- "Less than Significant with Mitigation Incorporated" means that the incorporation of one or more mitigation measures is necessary to reduce the impact from potentially significant to less than significant.
- "Potentially Significant Impact" means that there is either substantial evidence that a project-related effect may be significant, or, due to a lack of existing information, could have the potential to be significant.

Any potential impacts resulting from the proposed Project would be temporary in nature during the construction phase. Because the proposed Project is a replacement of an existing line, no operational impacts would occur from the proposed Project.

4.1 AESTHETICS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Except as provided in Public Resources Code Section 21099, would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐	1
b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒	4
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐	1
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒	1

Environmental Setting

The proposed Project Area does not consist of any features that would block any possible City-designated scenic views. SR-1, the nearest designated scenic highway, is located approximately 350 ft east of the proposed Project Area. SR-1 is an official state scenic highway from Santa Cruz to the southern City Limits of Half Moon Bay (Caltrans 2019). Existing land uses adjacent to the proposed Project Area consist of various multifamily residential properties, Oak Avenue Park, and a pedestrian bridge that crosses Pilarcitos Creek at the intersection between Oak Avenue and Pilarcitos Avenue. Residences and commercial uses have direct views of the proposed Project Area. Existing sources of nighttime light in the proposed Project Area include vehicle headlights, parking lot lights, and residential lighting. Existing sources of glare are mainly limited to automobile windshields and reflective building materials associated with residential and commercial uses. The City's Local Coastal Program/Land Use Plan (LCP/LUP) and Zoning Code includes policies and standards addressing visual resources in the City. Chapter ~~7~~9, Scenic and Visual Resources, of the LCP/LUP addresses the protection of views of scenic areas and visual resources visible from public

roads and trails. The LCP/LUP also includes a ~~Visual Resource Overlay Map~~ Scenic & Visual Resource Areas map that identifies existing visual resources located throughout the City.

Discussion of Impacts

a) **Less than Significant Impact.** Scenic vistas include broad views of mountain ranges, ridgelines, the beach, and the ocean as viewed from a highway, park, or other public space, particularly those designated for the express purpose of viewing and sightseeing. A project would impact a scenic vista if it were to substantially change, introduce incompatible scenic elements, block, or remove a scenic vista.

Views from within Oak Park and the Strawflower Center are enclosed by existing vegetation so that broad scenic views are not available. According to the Scenic & Visual Resource Area map ~~Visual Resources Overlay Map~~ in the LCP/LUP, there are no designated ~~shoreline~~ scenic coastal access routes from or through the proposed Project Area. The proposed Project would not result in the construction of new buildings or other above-ground facilities on-site; all structures would be sub-surface and therefore would not introduce incompatible elements which could impact scenic vistas. Thus, impacts would be less than significant, and no further analysis is required.

b) **No Impact.** A significant impact may occur if scenic resources within a state scenic highway would be damaged or removed by a project. The proposed Project Area is not located within an officially designated state scenic highway. SR-1 is the nearest officially designated state scenic highway, located approximately 350 ft east of the proposed Project Area. Motorists are not able to view the proposed Project Area, as potential views from SR-1 are blocked by residential housing, commercial structures, and existing vegetation (Figure 8 and Figure 9).

c) **Less than Significant Impact.** A significant impact may occur if a project were to introduce visual elements that would be incompatible with the character of the project site and surrounding areas. The LCP/LUP considers riparian corridors significant plant communities that serve to visually frame the surrounding scenery in addition to providing local landmarks and place-identifiers. The proposed Project is completely underground and would not introduce an incompatible visual element to the site or surrounding area. During the construction phase, the truck loading area behind Safeway and a portion of Oak Park would be disturbed to install the pipeline which would temporarily modify views from nearby residential properties and access roads to the Pilarcitos Creek riparian corridor. Views of the open trenches, pipe stored along Pilarcitos Avenue, construction equipment, and stockpiled soil would be visible for brief periods as segments of the pipeline are installed. The activities are typical of pipeline installation in developed areas and would not substantially degrade views of the existing setting. Once the pipeline is in place, views would be restored to the same as existing conditions. Therefore, the proposed Project would not significantly impact the visual character or quality of the site or surroundings and no further analysis is required.

d) **No Impact.** The proposed Project would not include any sources of light or daytime glare and long-term operation of the proposed Project would not add new sources of light or glare. Upon completion of construction the light and glare conditions at the proposed Project Area would be the same as the existing conditions and therefore there is no impact.

Figure 8. View from SR-1 looking west at Pilarcitos Creek bridge.

Figure 9. View from SR-1 looking west from south of San Mateo Road.

4.2 AGRICULTURE AND FORESTRY RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒	5
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒	3
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒	3
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒	1
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒	1,5

Environmental Setting

According to the San Mateo County Important Farmland Map (California Department of Conservation 2014), the proposed Project Area is designated as Urban and Built-Up Land. The City's LCP/LUP designates the site Residential – ~~Medium~~ High Density and Commercial – General. The pipeline traverses

land zoned as Multiple Family Residential (R-3), Open Space – Conservation (OS-C), and Commercial General (C-G) (City of Half Moon Bay 2015).

The Williamson Act of 1965 allows local governments to enter into contract agreements with local landowners with the purpose of trying to limit specific parcels of land to agricultural or other related open space uses. The proposed Project Area does not contain any state designated agricultural lands or open space. The proposed Project Area is not subject to a Williamson Act Contract.

Discussion of Impacts

a-e) **No Impact.** The proposed Project Area is in an urban built-up state and does not contain any agricultural land. There are no agricultural or forestry resources within the proposed Project Area. There are no Prime, Unique, Statewide or Locally Important farmlands in the area. The proposed Project Area not under a Williamson Act Contract, nor is the Project zoned as forest land or timber production. The proposed Project would be confined to existing rights-of-way and therefore no impacts to agricultural or forestry resources are anticipated.

4.3 AIR QUALITY

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	1,16
b) Result in a cumulatively-considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard?	☐	☐	☒	☐	1,16
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐	1,16
d) Result in other emissions such as those leading to odors adversely affecting a substantial number of people?	☐	☐	☒	☐	1,16

Environmental Setting

The proposed Project Area is in the San Francisco Bay Area air basin, where air quality is monitored and regulated by the BAAQMD. Ambient concentrations of key air pollutants have decreased considerably over the course of the last several decades. Air pollution is generated by anything that burns fuel (including but not limited to cars and trucks, construction equipment, backup generators, boilers and hot water heaters, barbeques and broilers, gas-fired cooking ranges and ovens, fireplaces, and wood-burning stoves), almost any evaporative emissions (including the evaporation of gasoline from service stations and vehicles, emissions from food as it is cooked, emissions from paints, cleaning solvents, and adhesives, etc.), and other processes (fugitive dust generated from roadways and construction activities, etc.).

A sensitive receptor is generally defined as a location where human populations, especially children, seniors, and sick persons, are located where there is a reasonable expectation of continuous human exposure to air pollutants. These typically include residences, hospitals, and schools. The site is surrounded by residential and commercial land uses.

The BAAQMD adopted the Final 2017 Clean Air Plan in April 2017. The plan updated the 2010 Clean Air Plan and includes strategies to reduce emissions of ozone precursors and emissions of fine particulate matter. The plan also provides a framework for long-term planning efforts to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050 (BAAQMD 2017).

The U.S. Environmental Protection Agency (EPA) has identified air pollutants that endanger public health and the environment, are widespread throughout the United States, and come from a variety of sources. These pollutants are called "criteria" air pollutants. National Ambient Air Quality Standards (NAAQS) have been established for each of them to meet specific public health and welfare standards. The EPA has established NAAQS for the following six criteria pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. The California Air Resources Board has set California Ambient Air Quality Standards (CAAQS) for the same six pollutants, as well as four additional pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The Bay Area is currently classified as "attainment" or "unclassifiable" with respect to every NAAQS except ozone and fine particulate matter ($PM_{2.5}$), for which it is still classified as "nonattainment." With respect to CAAQS, the Bay Area is currently classified as "nonattainment" for ozone, respiratory particulate matter smaller than 10 microns (PM_{10}), $PM_{2.5}$ (BAAQMD 2017).

Discussion of Impacts

a, b) ***Less Than Significant Impact.*** Construction activities would result in short-term increases in emissions from the use of vehicles and heavy equipment, including excavators, drill rigs, front loaders, mud mixing plants, and separation plants, ~~that~~ which generate~~s~~ dust, exhaust, and tire-wear emissions; soil disturbance; materials used in construction; and construction traffic. Project construction would produce fugitive dust (PM_{10} and $PM_{2.5}$) during ground disturbance and would generate carbon monoxide, ozone precursors, and other emissions from vehicle and equipment operation. BAAQMD has developed preliminary screening criteria to provide lead agencies with a way to identify whether a proposed project could result in potentially significant air quality impacts. The screening levels generally represent new development on undeveloped sites without any form of mitigation measures taken into consideration. If a proposed project meets all of the screening criteria, then the lead agency would not need to perform a detailed air quality assessment of project air pollutant emissions, and the construction of the project would result in a less-than-significant impact from criteria air pollutant and precursor emissions. The BAAQMD screening criteria include the following:

1. The project is below the construction and operational screening size (Table 3-1 of BAAQMD CEQA Guidelines);
2. The project design and implementation includes all BAAQMD Basic Construction Mitigation Measures;
3. Construction-related activities would not include any of the following:
    a. Demolition;
    b. Simultaneous occurrence of more than two construction phases (e.g., paving and building construction would occur simultaneously);
    c. Simultaneous construction of more than one land use type (e.g., the project would develop residential and commercial uses on the same site);
    d. Extensive site preparation (i.e., greater than default assumptions used by the Urban Land Use Emissions Model [URBEMIS] for grading, cut/fill, or earth movement); or
    e. Extensive material transport (e.g., greater than 10,000 cubic yards of soil import/export) requiring a considerable amount of haul truck activity.

The Project meets the BAAQMD screening criteria listed above and therefore would not need to be modeled for construction or operational emissions. BMPs recommended by BAAQMD and identified above in the Project Description would be implemented during construction to minimize fugitive dust. All pipeline improvement activities would take place within ~~existing roads~~ developed

or maintained park areas, within in a developed community. Construction emissions would be relatively low and temporary, lasting approximately two months, and would not have long-term effects on air quality at the proposed Project Area, in the project vicinity, or within the Bay Area. Construction-related activities would not include demolition, simultaneous occurrences of more than two construction phases, simultaneous construction of more than one land use type, extensive site preparation, and import/export of greater than 10,000 cubic yards of soil or any extensive material transport requiring a considerable amount of haul truck activity. Because of the small area of disturbance, temporary nature of the emissions, and implementation of construction measures, Project activities would not result in the generation of construction-related criteria air pollutants and/or precursors that exceed the Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors shown in Table 3-1 of BAAQMD's CEQA Guidelines. ~~i~~Impacts on air quality would be less than significant and the Project would comply with the Bay Area 2017 Clean Air Plan.

As discussed under items a), the proposed Project would result in minor construction-related emissions. It would not result in a cumulatively considerable net increase of any criteria pollutant. The proposed Project would cause short-term air quality impacts as a result of construction activities; however, it would not result in long-term or cumulatively considerable increases in air quality pollutant emissions for which the Bay Area is currently in non-attainment (ozone and particulate matter). Implementation of the BMPs included in the Project Description would ensure that the temporary increase in air pollutant emissions associated with construction activities would result in less than significant contributions to cumulative pollutant levels in the region.

c) **Less than Significant Impact.** The primary sensitive receptors in the vicinity are residents and, employees and customers of commercial development, which may include children, elderly people, or people with respiratory illnesses. Sensitive receptors located in close proximity to several locations along the construction area could be exposed to temporary air pollutants from construction activities, such as fugitive dust, ozone precursors, and carbon monoxide. The duration of construction activities would be limited. Basic construction measures recommended by BAAQMD, listed in the Project Description, would be implemented during construction to minimize air pollutants. ~~New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g., 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit requirements required by the California Code of Regulation (CCR; 13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116).~~ The District would require the contractor to use the latest model (Tier 4) engines for construction equipment. As a result, sensitive receptors in the vicinity of the proposed Project would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.

d) **Less than Significant Impact.** Construction activities would involve the use of gasoline or diesel-powered equipment that emits exhaust fumes and would involve asphalt paving, which has a distinctive odor during application. Asphalt would conform to BAAQMD regulations governing asphalt (Regulation 8, Rule 15). These activities would take place intermittently throughout the workday, and the associated odors are expected to dissipate within the immediate vicinity of the work area. Persons near the construction work area may find these odors objectionable. However, the proposed Project would not include uses that have been identified by BAAQMD as potential sources of objectionable odors, such as restaurants, manufacturing plants, landfills, and agricultural and industrial operations. The infrequency of the emissions, rapid dissipation of the exhaust and other odors into the air, and short-term nature of the construction activities would result in less than significant odor impacts. Additionally, no odors would be emitted during operation of the proposed

Project. The proposed Project would have a less than significant impact on sensitive receptors due to odors.

4.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	1, 6, 11
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U. S. Fish and Wildlife Service?	☐	☒	☐	☐	1, 6, 11
c) Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐	1, 11
d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐	1, 11
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐	7, 11

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan?	☐	☐	☐	☒	1, 11

The following analysis of biological resources is based on a site assessment performed by WRA, Inc. on January 14, 2021.

Environmental Setting

Biological Communities in the Proposed Project Area

WRA, Inc. biologists conducted a site assessment on January 14, 2021. See Appendix A of the Biological Resources Evaluation for a list of observed or documented plant species within or near the proposed Project Area. Non-sensitive biological communities in the proposed Project Area include developed/disturbed areas (Figure 10). Two sensitive biological communities, or Environmentally Sensitive Habitat Areas (ESHA), occur in the proposed Project Area: a perennial stream and riparian corridor habitat. Figure 11 illustrates the extent of riparian habitat in the proposed Project Area.

The developed/disturbed areas include paved parking areas and sidewalks, road shoulders, and park lawns. Developed/disturbed areas within Oak Avenue Park include a portion of the paved walking trail and adjacent regularly mowed lawn area. An approximately 0.1-mile portion of the sidewalk and eastern side of Pilarcitos Avenue is included in the developed/ disturbed land cover.

Pilarcitos Creek, a perennial stream, extends through the proposed Project Area in an east-west direction. The creek channel, as delineated by ordinary high water mark (OHWM), is a water of the United States subject to the jurisdiction of the Corps under the Clean Water Act (CWA). The creek, as delineated by top of bank (TOB), would be considered as waters of the state subject to the jurisdiction of the RWQCB under the Porter-Cologne Act and California Department of Fish and Wildlife (CDFW) under the California Fish and Game Code (CFGC). The creek is also an ~~potential~~ ESHA subject to the jurisdiction of the CCC/Half Moon Bay LCP.

Within the proposed Project Area, riparian habitat along Pilarcitos Creek is dominated by red alder (*Alnus rubra*), Fremont cottonwood (*Populus fremontii*), red willow (Salix laevigata), and arroyo willow (*Salix lasiolepis*). This community meets the definition of red willow riparian forest Salix laevigata Woodland Alliance defined by Sawyer et al. (2009). In upland areas outside of the creek TOB, the understory was dominated by herbs and forbs including stinging nettle (*Urtica dioica*), cape ivy (*Delairea odorata*), Nasturtium (*Tropaeolum majus*), Himalayan blackberry (*Rubus armeniacus*), and California blackberry (*Rubus ursinus*).

The overstory of the Project Area consisted of ~~more than 50 percent of~~ riparian species including red alder, arroyo willow, and alder that contribute to the function and distinction of the riparian habitat; accordingly, the vegetation within the proposed Project Area meets the CCC/Half Moon Bay LCP definition of riparian corridor. Riparian areas in the proposed Project Area could potentially be subject to the jurisdiction of the RWQCB, CDFW, and the CCC/Half Moon Bay LCP. Several trees in the proposed Project Area could meet the species and size requirements needed to be considered a "heritage tree" under Chapter 7.40, "Heritage Trees" (Tree Ordinance), of the City's Municipal Code. The Project will not impact any protected or non-protected trees within and adjacent to the Proposed Project Area.

Special-Status Species in the Proposed Project Area

Special-Status Plant Species

All of the 60 special-status plant species documented in the vicinity of the Proposed Project Area are unlikely or have no potential to occur in the Proposed Project Area due to lack of suitable habitat.

Special-Status Wildlife Species

Of the 41 special-status wildlife species known to occur in the vicinity of the proposed Project Area, 34 of these species are unlikely or have no potential to occur there (see Appendix A in the Biological Resources Evaluation). Species may have been considered unlikely to occur due to lack of available habitat or, in some cases, the distance of the proposed Project Area from documented occurrences. The special-status wildlife species discussed below have a potential to occur in the proposed Project Area.

Western pond turtle (*Actinemys marmorata*), CDFW Species of Special Concern. The western pond turtle is the only native freshwater turtle in California. This turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. Western pond turtles inhabit annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 ft in elevation. Western pond turtles also occupy man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks, and sand. Warm, shallow, nutrient-rich waters are ideal as they support western pond turtle prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, western pond turtles often occupy creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high-water flow, high salinity, or prolonged dry conditions, western pond turtles may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting, this species preferentially utilizes aquatic and riparian corridors for movement and dispersal.

There have been no documented occurrences of this species within 5 miles of the Proposed Project Area (CDFW 2021). At the time of the January 14, 2021, site visit, the portion of Pilarcitos Creek within the Proposed Project Area was slow-moving, which is a positive attribute for turtles. It was shallow and clear, however, and did not provide aquatic escape habitat for turtles to evade predators. It is likely that during the rainy season, the creek would provide more aquatic escape habitat. The creek is also very entrenched through the Proposed Project Area, likely making it difficult for turtles to move to upland habitat for nesting or seasonal refuge. Western pond turtles are unlikely to nest in or adjacent to the Proposed Project Area, though it may occasionally move through or bask within the Proposed Project Area when there are appropriate water levels and sufficient sunlight passes through the tree canopy. Therefore, there is a moderate potential for this species to occur within the Proposed Project Area.

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), Federal Endangered, State Endangered, CDFW Fully Protected. Historically, San Francisco garter snake occurred in scattered wetland areas on the San Francisco Peninsula from approximately the San Francisco County line south along the eastern and western bases of the Santa Cruz Mountains, at least to the Upper Crystal Springs Reservoir, and along the coast south to Año Nuevo Point, San Mateo County, and Waddell Creek, Santa Cruz County. The preferred habitat of the San Francisco garter snake is a densely vegetated pond near an open hillside where they can sun themselves, feed, and find cover in rodent burrows; however, considerably less-ideal habitats can be successfully occupied. Temporary ponds and other seasonal freshwater bodies are also used. Emergent and bankside vegetation such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.) and spike rushes (*Juncus* spp.

and *Eleocharis* spp.) apparently are preferred and used for cover. The area between stream and pond habitats and grasslands or bank sides is used for basking, while nearby dense vegetation or water often provide escape cover. Snakes also use floating algal or rush mats, if available.

There are two significant components to San Francisco garter snake habitat: 1) ponds or suitable habitat that support California red-legged frog, American bullfrog (*Rana catesbeiana*), or the Pacific chorus frog (*Pseudacris regilla*) and 2) surrounding upland that supports Botta's pocket gopher *(Thomomys bottae)* or the California meadow vole *(Microtus californicus)*. Ranid frogs are an obligate component of the San Francisco garter snake's diet (USFWS 2006).

San Francisco garter snake has been documented to occur within Pilarcitos Creek (CDFW 2021). There is not a substantial amount of emergent vegetation within the Proposed Project Area, but the snake may still move through and occasionally forage within aquatic habitat and uplands on-site. Based on habitat conditions and the close proximity of documented occurrences, there is a high potential for this species to occur, at least as a transient, within the Proposed Project Area.

California red-legged frog (*Rana draytonii*), Federal Threatened Species, CDFW Species of Special Concern. California red-legged frog is dependent on suitable aquatic, estivation, and upland habitat. During periods of wet weather, starting with the first rainfall in late fall, red-legged frogs disperse away from their estivation sites to seek suitable breeding habitat. Aquatic and breeding habitat is characterized by dense, shrubby, riparian vegetation and deep, still, or slow-moving water. Breeding occurs between late November and late April. California red-legged frog estivate (period of inactivity) during the dry months in small mammal burrows, moist leaf litter, incised stream channels, and large cracks in the bottom of dried ponds.

There are four physical and biological features that are considered to be essential for the conservation or survival of a species. The features for the California red-legged frog include aquatic breeding habitat; non-breeding aquatic habitat; upland habitat; and dispersal habitat (USFWS 2010).

Aquatic breeding habitat consists of low-gradient freshwater bodies, including natural and manmade (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. It does not include deep water habitat, such as lakes and reservoirs. Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years. This is the average amount of time needed for egg, larvae, and tadpole development and metamorphosis so that juveniles can become capable of surviving in upland habitats (USFWS 2010).

Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frog. These waterbodies include plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. The California red-legged frog can use large cracks in the bottom of dried ponds as refugia to maintain moisture and avoid heat and solar exposure (Alvarez 2004). Non-breeding aquatic features enable California red-legged frog to survive drought periods and disperse to other aquatic breeding habitat (USFWS 2010).

Upland habitats include areas within 300 ft of aquatic and riparian habitat and are comprised of grasslands, woodlands, and/or vegetation that provide shelter, forage, and predator avoidance. These upland features provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat can include structural features such as boulders, rocks, and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter (USFWS 2010).

Dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites. Dispersal habitat includes various natural and altered habitats such as agricultural fields, which do not contain barriers to dispersal. Moderate- to high-density urban or industrial developments, large reservoirs, and heavily traveled roads without bridges or culverts are considered barriers to dispersal (USFWS 2010). Although California red-legged frog is highly aquatic, this species has been documented to make overland movements of several hundred meters and up to one mile during a winter-spring wet season in Northern California (Bulger et al. 2003; Fellers and Kleeman 2007) and 2,860 meters (1.8 miles) in the central California coast (Rathbun and Schneider 2001). Frogs traveling along water courses can exceed these distances.

The portion of Pilarcitos Creek within the Proposed Project Area may provide suitable aquatic breeding and dispersal habitat for this species. The riparian canopy cover and low gradient, slow-moving intermittent creek are positive habitat attributes. This species is unlikely to use uplands within the Proposed Project Area, however, due to the highly entrenched banks around the creek, which are likely difficult for this frog to climb in most locations, and due to the highly developed area surrounding the Proposed Project Area. This species was documented directly adjacent to the Proposed Project Area in 2006 (CDFW 2021). Based on habitat conditions and the close proximity of documented occurrences, there is a high potential for this species to occur within the Proposed Project Area.

Steelhead - Central California Coast Distinct Population Segment (*Oncorhynchus mykiss irideus*), Federal Threatened. The Central California Coast Distinct Population Segment includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending two years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4-or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.

This species has been observed within Pilarcitos Creek, and both adults and smolting juveniles likely pass through the Proposed Project Area on their way to or from breeding grounds. This species is likely to be present only seasonally when water levels allow fish passage, during migrations to spawning grounds further upstream, and during outmigration. Based on habitat characteristics and documented occurrences within Pilarcitos Creek, this species has a high potential to occur within the Proposed Project Area.

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), CDFW Species of Special Concern. This subspecies of the dusky-footed woodrat occurs in the Coast Ranges between San Francisco Bay and the Salinas River (Matocq 2002). Occupied habitats are variable and include forest, woodland, riparian areas, and chaparral. Woodrats feed on woody plants, but will also consume fungi, grasses, flowers, and acorns. Foraging occurs on the ground and in bushes and trees. This species constructs robust stick houses/structures in areas with moderate cover and a well-developed understory containing woody debris. Breeding takes place from December to September. Individuals are active year-round, and generally nocturnal.

This species has been documented 3.5 miles to the northeast in vegetated areas along state highway 35 (CDFW 2021). While not documented in urban Half Moon Bay, this species is generally present in the region and is known to create nests in densely vegetated areas including riparian areas. While no stick nest

structures were observed within the Proposed Project Area during the January 2021 site visit, conditions are potentially favorable for occupation by this species were they to disperse to the Proposed Project Area from generally more suitable habitats. Although impacts to the riparian area are not anticipated in the course of this Project, woodrat may establish nests adjacent to work areas and thus have moderate potential to occur.

Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 10. Land Cover Types within the Project Area

0 100 200 Feet

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Path: L:\Acad 2000 Files\29000\29375\GIS\ArcMap\Fig5_JurisFeatures.mxd

Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 11. Potential Jurisdictional Features Located within the Project Area

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Regulatory Setting

Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, and riparian habitat. These habitats are regulated under federal regulations (such as the CWA, state regulations (such as the Porter-Cologne Act, CDFW Streambed Alteration Program, and CEQA), or local ordinances or policies (such as City or County Tree Ordinances, Special Habitat Management Areas, applicable LCPs, and General Plan Elements).

Waters of the United States Regulated by the U.S. Army Corps of Engineers

The Corps regulates "Waters of the United States" under Section 404 of the CWA. Waters of the United States are defined in the Code of Federal Regulations (CFR) as including the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, such as tributaries, lakes and ponds, impoundments of waters of the U.S., and wetlands (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Unvegetated waters including lakes, rivers, and streams may also be subject to Section 404 jurisdiction and are characterized by an OHWM identified based on field indicators such as the lack of vegetation, sorting of sediments, and other indicators of flowing or standing water. The placement of fill material into Waters of the United States generally requires a permit from the Corps under Section 404 of the CWA.

Waters of the State Regulated by the Regional Water Quality Control Board

The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The State Water Resources Control Board (SWRCB) and nine RWQCBs protect waters within this broad regulatory scope through many different regulatory programs. Waters of the State in the context of a CEQA Biological Resources evaluation include wetlands and other surface waters protected by the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (SWRCB 2019). The SWRCB and RWQCB issue permits for the discharge of fill material into surface waters through the State Water Quality Certification Program, which fulfills requirements of Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a CWAEPA permit are also required to obtain a Water Quality Certification. If a project does not require a federal permit but does involve discharge of dredge or fill material into surface waters of the State, the SWRCB and RWQCB may issue a permit in the form of Waste Discharge Requirements.

Sensitive Biological Communities Regulated by CDFW

Streams and lakes, as habitat for fish and wildlife species, are regulated by CDFW under Sections 1600-1616 of CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined in the CCR as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). The term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian vegetation has been defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

The CDFW also ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2018) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G).

Sensitive Biological Communities Regulated by the California Coastal Commission and Half Moon Bay Local Coastal Program

The California Coastal Commission guidelines contain definitions for specific types of ESHAs, including wetlands, estuaries, streams and rivers, lakes, open coastal waters and coastal waters, riparian habitats, other resource areas, and special-status species and their habitats. Chapter 6 of the LUP and Chapter 18.38 of the Municipal Code ~~The Half Moon Bay LCP~~ define~~s~~ sensitive habitat and coastal resource areas for conservation to include: sand dunes; marine habitats; sea cliffs; riparian areas; wetlands, coastal tidelands and marshes, lakes, ponds, and adjacent shore habitats; coastal or off-shore migratory bird nesting sites; areas used for scientific study, refuges, and reserves; habitats containing unique or rare and endangered species; rocky intertidal zones; coastal scrub communities; wild strawberry habitat; and archaeological resources. Any areas that may meet the definition of any ESHA as defined by the CCC guidelines or the Half Moon Bay LCP are considered sensitive in this document.

The boundaries of wetland areas regulated by the Corps and CCC/Half Moon Bay LCP are often not the same due to the differing goals of the respective regulatory programs and also because these agencies use different definitions for determining the extent of wetland areas. As previously described, the Corps requires that positive indicators for all three parameters, the presence of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation, be present for an area to meet the Corps' wetland definition. The CCC/Half Moon Bay LCP does not necessarily require that all three wetland indicators (wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation) be present for an area to be determined to be a "wetland"; rather, the presence of only one of these three parameters could be sufficient for a positive wetland determination.

The City's LCP outlines permitted uses within specific ESHAs. Permitted uses within riparian corridors, and riparian corridor buffers, such as the habitat associated with Pilarcitos Creek, include necessary water supply projects (City of Half Moon Bay ~~1993~~2020).

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act (FESA) or California Endangered Species Act (CESA). These Acts afford protection to both listed and proposed species. In addition, CDFW Species of Special Concern and the National Marine Fisheries Service Species of Concern, which are species that face extirpation if current population and habitat trends continue, USFWS Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, and young is illegal.

Bat species designated as "High Priority" by the Western Bat Working Group qualify for legal protection under Section 15380(d) of the CEQA Guidelines. Species designated "High Priority" are defined as

"imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats" (WBWG 2020). Plant species on California Native Plant Society (CNPS) Lists 1 and 2 are also considered special-status plant species. Impacts to these species are considered significant according to CEQA (CNPS 2020).

Critical Habitat

Critical habitat is a term defined and used in the FESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The FESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery. In many cases, this level of protection is similar to that already provided to species by the FESA "jeopardy standard." However, areas that are currently unoccupied by the species, but which are needed for the species' recovery, are protected by the prohibition against adverse modification of critical habitat.

Relevant Local Policies, Ordinances, Regulations

City of Half Moon Bay Heritage Tree Ordinance

Pursuant to Section 7.40 of the Half Moon Bay Municipal Code, a heritage tree is defined as a tree located on public or private property, exclusive of eucalyptus, with a trunk diameter of 12 inches or circumference of approximately 38 inches measured at 48 inches above ground level; a tree or stand of trees designated by City Council resolution to be heritage trees based on special historical, environmental, or aesthetic value; or any street tree located within the public right of way along the entire length of Main Street (City of Half Moon Bay 2020).

City of Half Moon Bay Local Coastal Land Use Plan

Policy 6-101: Alternation of Natural Watercourse. Prohibit alterations or disturbance of natural watercourses, or human-made or altered drainage courses that have replaced natural watercourses and serve the same function, with the following exceptions:

a. Necessary water supply projects;
b. Flood, sedimentation, or erosion control projects to protect public safety and existing structures where there is no other feasible alternative; or
c. The improvement of fish and wildlife habitat.

Any alterations permitted for one of these three purposes shall: adhere to the performance standards listed for permitted uses within riparian corridors in Policy 6-47; minimize adverse impacts to coastal resources, including the depletion of groundwater and changes in water flow speed and volume; and include maximum feasible mitigation measures to mitigate unavoidable impacts. Green infrastructure shall be preferred for flood protection, erosion, and sedimentation control over "hard" solutions such as concrete or riprap channels. Any permitted watercourse alterations shall include BMPs for hydromodification activities.

Discussion of Impacts

a) **Less than Significant with Mitigation Incorporated.** Special-status plant species would not be affected by project construction activities. The work areas do not support suitable habitat for special-status plant species known to occur in the vicinity of the proposed Project Area. ~~Implementation of Mitigation Measure BIO-1 would limit all construction activities to designated areas at minimum 15 ft from the top of the creek bank.~~ Impacts to special-status plant species would be less than significant.

Common and special-status wildlife, particularly nesting birds, may be exposed to noise and other disturbance during construction, but these activities are typical of urban environments and these species are usually acclimated to these types of disturbance. In addition to regulations for special-status species, most birds, including non-special-status species, are protected by the CFGC. Under this legislation, destroying active nests, eggs, and young is illegal. The primary potential for impacts to birds (both special-status and non-special-status) would be direct impacts (including physical impacts) to active bird nests during the breeding bird season (defined generally as February 1 to August 31). In addition, construction activities could result in noise and visual impacts associated with construction of the proposed project could result in: (1) nest abandonment; (2) loss of young; (3) reduced health and vigor of eggs and/or nestlings (resulting in reduced survival rates). However, implementation of Mitigation Measure BIO-2 would reduce such impacts to birds to a less-than-significant level.

It is not anticipated that HDD activities will affect the California red-legged frog, San Francisco garter snake, western pond turtle, bats, or steelhead. However, HDD does have the potential for "frac-out", when pressure built up in the bore tunnel that can force drilling mud up through the ground and into the natural environment. Generally a frac-out event results in relatively small release of sediment-laden water into the surrounding environment before it is contained. The HDD crossing has been designed to minimize the risk of frac-outs (see Preliminary Design Report, Appendix F). Although it is unlikely, if frac-out occurs, it may affect habitat and potentially impact individuals of these species. California red-legged frogs, San Francisco garter snakes, and western pond turtles may inhabit aquatic habitat and the banks of Pilarcitos Creek within the proposed Project Area, and steelhead habitat includes aquatic features and the cover provided by riparian trees. These species may forage and disperse through the proposed Project Area. No vegetation removal or ground disturbance is planned within 15 ft of the top of the creek bank. Out of an abundance of caution, implementation of Mitigation Measure BIO-1 would limit all vegetation removal and ground disturbance to at minimum 15 ft above the top of creek bank and within developed or park areas, minimizing the potential for accidental encroachment into areas with potential to support these sensitive wildlife species. Additionally, Mitigation Measure BIO-1 requires a qualified biologist to be present during all drilling operations to ensure drilling operations do not affect sensitive wildlife species. ~~Implementation of~~ Mitigation Measure BIO-3 requires a Frac-out Plan be developed containing prevention measures to minimize the potential for frac-out, frac-out detection methods, corrective and containment measures, clean-up response, and agency notification procedures. Implementation of Mitigation Measures BIO-1 and BIO-3 would reduce such impacts to California red-legged frog, San Francisco garter snake, western pond turtle, bats, and steelhead to a less-than-significant level.

San Francisco dusky-footed woodrat has potential to occur in densely vegetated riparian areas of the Proposed Project Area. While no disturbance to these areas is anticipated as a result of HDD, any traversal of the riparian area could result in impacts to woodrat nests that may be present. Implementation of Mitigation Measures BIO-4 would reduce such impacts to San Francisco dusky-footed woodrat to a less-than-significant level.

Mitigation Measure BIO-1: All vegetation removal~~,~~ and construction-related ground disturbance~~, and other construction activities~~ shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas. ~~to avoid low-lying mesic areas on the fringe of the creek.~~ A qualified biologist will monitor all drilling operations to ensure impacts to sensitive species and habitat are avoided.

Mitigation Measure BIO-2: Proposed Project activities shall occur between September 1 and February 14 in order to avoid potential impacts during the nesting season. If Project activities are conducted during the nesting season (February 15 – August 31), a pre-construction nesting bird survey shall be performed no more than 14 days prior to initial ground disturbance to avoid impacting active nests. If the survey identifies any active nests, an exclusion buffer shall be established for protection of the nest. Buffer distances shall vary based on species and conditions at the site, but typically range from 25 up to 500 ft. The buffer shall be maintained until all young have fledged or until the nest fails, or otherwise becomes inactive. Buffers may be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

Mitigation Measure BIO-3: The following measures shall be implemented to avoid impacts to California red-legged frog, San Francisco garter snake, western pond turtle, and steelhead:

- The Project has been designed and shall be implemented in such a way to avoid and minimize the risk of spills and frac-outs, as evaluated in the Preliminary Design Report (Appendix F) for this Project. Although the risk of frac-outs was identified as low, the HDD contractor shall prepare a Frac-out and Surface Spill Prevention Plan, based on information contained in the HDD Specifications section 02413, prepared by EKI and dated April 2021. The Frac-out Plan shall be~~ submitted to the City for approval~~ prepared prior to construction~~ the issuance of the grading permit, and the contractor shall submit a letter signed by an authorized representative confirming that the plan will be followed during all HDD activity~~. The plan shall address the potential risks and modes of frac-outs and frac-out prevention and detection. The plan shall include a project description, including site description, existing conditions, relevant permit requirements, and HDD design and operations, and shall at a minimum include the following information.

    - Calculations of maximum allowable and minimum required drilling fluid pressures, and the critical downhole pressure that would cause hydrofracture.

    - Measures describing training of personnel regarding frac-out monitoring procedures, equipment, materials, and procedures in place for the prevention, containment, cleanup, and disposal of drilling fluids.

    - Pre-construction measures such as lining the entry pit with an impervious flexible membrane, creating an earth berm, or erecting silt fence around the drilling fluid mixing and pumping areas, and erecting silt fences between the drilling staffing areas and sensitive areas.

    - Identifying the personnel on site during the entire HDD installation process with responsibility for detecting whether surface returns have occurred and how they will conduct the monitoring.

    - Monitoring of drilling pressures to ensure that they are maintained at a minimum level necessary to maintain fluid circulation and do not exceed those pressures that may penetrate the ground.

- Monitoring of fluid returns at the exit and entry pit to determine if fluid circulation has been lost.

- The Contractor shall measure and record the drilling fluid viscosity and density at least two times per shift or once every 150 feet of advancement, whichever is more frequent, with at least two hours between readings, using a calibrated Marsh funnel or rheometer/rotating viscometer, and a mud balance. These records shall be maintained and provided daily to the Engineer.

- Protocols to be followed if there is a loss of circulation or other indication of frac-out are described below.

  - Immediately respond to detection of a frac-out by stopping drilling operations and pulling back the drill head to relieve pressure.

  - Implement procedures to contain terrestrial returns (e.g., by an earth berm, installation of materials to contain the fluid, or other method).

  - Implement procedures to contain returns into a waterway or sensitive area (e.g., installation of sandbags or a standpipe or barrel tall enough to exceed the water level and sealed at the base).

  - Implement procedures for clean-up and disposal of frac-out materials.

  - Include an on-site materials list to manage and control drilling fluid surface releases, such as heavy weight plastic gravel filled and sealed bags, splash boards, 5-gallon hard plastic pails, wide heavy-duty push brooms, flat blade and round-nose shovels, silt fence and t-posts or straw bales, chicken wire or connecting material to tie off the perimeter of a dewatering structure, absorbent pads to use with plastic sheeting for placement beneath motorized equipment, straw wattles, portable pumps, hoses, vacuum trailers or trucks, silt fence or screens.

  - ~~The performance standard for this mitigation measure is that~~ ~~I~~if a frac-out event occurs, the qualified biological monitor present during drilling operations shall be consulted to minimize disturbance to sensitive species and habitat during any immediate response and containment actions. Following containment, a qualified biologist shall document any adverse impact to sensitive habitat or species to help inform whether remedial actions may be warranted. If remedial actions are warranted, in consultation with the City and any relevant regulatory agencies, a mitigation plan will be developed with the proposed remedial actions and measurable performance standards to ensure adversely affected habitat is restored to pre-construction conditions or better. The mitigation plan will be submitted to ~~cleanup, surveys, photographs, agency or consultant recommendations, and a mitigation plan shall be submitted to~~ the City of Half Moon Bay and any relevant regulatory ~~permitting~~ agencies within 30 days of the event for review and approval. ~~Measures taken might include habitat restoration efforts, or surveys of special status species to assess impacts of the frac-out event.~~ The City and relevant regulatory agencies shall inspect and approve any remedial actions taken by the Lead Agency to respond to the frac-out event.

Mitigation Measure BIO-4: To avoid impacts to the San Francisco dusky-footed woodrat, a pre-construction survey shall be conducted to search for stick nests in suitable habitats adjacent to the work area. Nest structures shall be avoided by Project work or access routes by a minimum of 5 ft. If avoidance

is not feasible, the nest structure shall be dismantled by a qualified biologist. Nest material would be moved to suitable adjacent areas that shall not be disturbed. If young are encountered during the dismantling process, the material would be placed back on the nest and remain undisturbed for a minimum of two weeks to give the young enough time to mature and leave on their own accord. After the young have left the nest, the nest dismantling process would begin again.

b) **Less than Significant with Mitigation Incorporated.** Impacts to stream and riparian habitat in the proposed Project Area would be avoided by using HDD in the portion of the pipeline that crosses Pilarcitos Creek below the creek bed. As previously stated, HDD does have the potential for "frac-out", when pressure built up in the bore tunnel that can force drilling mud up through the ground and into the natural environment. Generally a frac-out event results in a relatively small release of sediment-laden water into the surrounding environment before it is contained. The HDD crossing has been designed to minimize the risk of frac-outs (see Preliminary Design Report, Appendix F). Although it is unlikely, if frac-out occurs, it may affect sensitive stream and riparian habitat. There is also potential for soil disturbance or accidental release of materials that would impact stream and riparian habitats. As such, a Frac-Out Plan will be required for this Pproject ~~and will be prepared by the District prior to the issuance of a grading permit~~. The Ffrac-Oout Pplan shall include prevention measures to minimize the potential for frac-out, frac-out detection methods, corrective and containment measures, clean-up response, and agency notification procedures.

In addition, the creek and associated riparian habitat ~~may~~ meet the definition of an ESHA as defined by the CCC guidelines or the Half Moon Bay LCP and are ~~would be~~ considered sensitive. The Half Moon Bay LCP outlines permitted uses within specific ESHAs. Permitted uses within riparian corridors and riparian corridor buffers, such as the habitat associated with Pilarcitos Creek, include necessary water supply projects (City of Half Moon Bay ~~1993~~2020). Any permit requirements will be implemented by the ~~p~~Project. ~~Implementation of Mitigation Measure BIO-4 3 would reduce such impacts to a less-than-significant level.~~

Project activities would occur at minimum 15 ft from the TOB within developed or maintained park areas and outside of riparian habitat, except for walk-over bore tracking and monitoring activities using hand-held equipment. A qualified biologist would monitor all drilling operations to ensure impacts to sensitive habitat are avoided. Implementation of Mitigation Measures BIO-1, BIO-3, and BIO-5 would reduce ~~such~~ impacts the creek and riparian habitat to a less-than-significant level.

Mitigation Measure BIO-5: The following general avoidance measures shall be implemented in the vicinity of stream and riparian habitat:

- Plastic monofilament netting (erosion control matting or wrapping around wattles), or similar material in any form shall not be used on the Project in order to avoid entangling, strangling, or trapping California red-legged frog, San Francisco garter snake, or western pond turtle.

- Prior to the start of groundbreaking activities, all construction personnel shall receive training on special-status species and their habitats by a qualified biologist. The importance of these species and their habitat shall be described to all employees as well as the minimization and avoidance measures that are to be implemented as part of the Project. A list of trained personnel shall be maintained by the contractor and be made available for review by the USFWS and the CDFW upon request.

- No trash shall be deposited on the site during construction activities. All trash shall be placed in trash receptacles with secure lids stored in vehicles and removed nightly from the Proposed Project Area.

- Any fueling and maintenance of equipment shall be conducted off-site and at least 50 ft from any designated ESHA, which includes Pilarcitos Creek and the associated riparian vegetation adjacent to the creek.

- When working within 50 ft of sensitive areas (e.g., adjacent to riparian habitat), wildlife exclusion fencing shall be installed and maintained around the perimeter of work areas. Exclusion fencing shall enclose any staged materials, equipment staging areas, work areas or access routes. Fencing shall be placed in areas which would prevent San Francisco garter snake and California red-legged frog from entering equipment or materials overnight. Once work in that area has been completed, exclusion fencing shall be removed as soon as possible. Exclusion fencing shall additionally be of a size and material that will not cause entrapment of California red-legged frog.

- Construction activities shall not start until 30 minutes after sunrise and shall cease 30 minutes before sunset.

- No holes or trenches shall be left open overnight. The contract documents will require that all trenches are backfilled or plated during non-working hours.~~Holes or trenches shall have at minimum escape ramps installed or be backfilled at the end of the day.~~

c) **Less than Significant.** Project activity will occur at minimum 15 ft from the TOB and within developed or maintained park areas, except for walk-over bore tracking and monitoring activities using hand-held equipment, and thus will not affect federally protected wetlands as defined by Section 404 of the CWA.

d) **Less than Significant.** Pilarcitos Creek likely provides a local movement corridor for common wildlife species. However, impacts to this movement corridor due to project activities are anticipated to be minor and temporary in nature, and thus less than significant. Where the pipeline crosses Pilarcitos Creek it would be installed via HDD below the creek bed.

e) **Less than Significant.** The Half Moon Bay LCP outlines permitted uses within specific ESHAs. Permitted uses within riparian corridors and riparian corridor buffers, such as the habitat associated with Pilarcitos Creek, include necessary water supply projects (City of Half Moon Bay 20~~11~~20). The City provides for the protection of "heritage trees", as defined above. The project is not expected to impact or require the removal of any trees, but if a tree must be removed or impacted, the project will comply with the City's tree ordinance.

f) **No Impact.** No state, regional, or federal habitat conservation plans or Natural Community Conservation Plans have been adopted for the proposed Project Area. An open-space conservation easement exists in Strawflower Shopping Center property (APN 056-300-150), which restricts development in the Pilarcitos Creek riparian zone and designates areas for permitted encroachments. The easement, however, explicitly exempts "the installation or repair of underground utility lines and septic systems" from the development restrictions.

4.5 CULTURAL RESOURCES

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:						
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☒	☐	1,3,12
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐	1,3,12
c)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	3,12

This section examines the potential impacts of the proposed project on cultural resources. Tribal cultural resources are addressed in Section 4.18, *Tribal Cultural Resources*. For the purposes of this analysis, the term cultural resource is defined as follows:

> *Indigenous and historic-era sites, structures, districts, and landscapes, or other evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or another reason. These resources include the following types of CEQA-defined resources: historical resources, archaeological resources, and human remains.*

The term indigenous, rather than prehistoric, is used in this section as a synonym for "Native American–related". This section relies on the information and findings presented in *Archaeological Survey Report, EKI CCWD Pilarcitos Creek Crossing* (Alta 2020). That report, provided in Appendix B of this report, details the results of the cultural resources study, which examined the environmental, ethnographic, and historic background of the proposed project site, emphasizing aspects of human occupation.

Environmental Setting

Native American Consultation

The Native American Heritage Commission (NAHC) was contacted via email to request a review of the Sacred Lands file and to request a list of Native American contacts in this area on February 16, 2020. The response letter dated February 24, 2020, by Sarah Fonseca (Cultural Resource Analyst) indicated that the search of the Sacred Lands File had a **positive** result. The NAHC response letter suggested that the lead agency contact the Ohlone tribe to provide further information regarding this result and to inquire about

any further consultation. The District is considered the responsible party to further conduct Native American consultation. Appendix B contains the results of the Native American communication.

Records Search

On February 18, 2020, Alex DeGeorgey, archaeologist with ALTA, conducted a records search (File Number 19-1414) at the Northwest Information Center (NWIC) located on the campus of Sonoma State University. The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historical records and reports for an 18-county area that includes San Mateo County. The records search included a review of all study reports on file within a one-half mile radius of the project area. A search of cultural resources included a one- half mile radius. Sources consulted include archaeological site and survey base maps, survey reports, site records, historic General Land Office maps.

Included in the review were:

- *California Inventory of Historical Resources* (California Department of Parks and Recreation 1976)
- *California Historical Landmarks* for San Mateo County (CA-OHP 1990)
- California Points of Historical Interest (CA-OHP 1992)
- Historic Properties Directory Listing (CA-OHP April 2012)
- *Historic Properties Directory* includes the National Register of Historic Places (April 2012) of the California Historical Landmarks and California Points of Historical Interest

Review of historic registers and inventories indicate that no historical resources are present in the project area. No National Register-listed or eligible properties are located within the 0.5-mile visual area of the Area of Potential Effects (APE).

A review of archaeological site and survey maps at the NWIC reveal that 25 cultural resources studies have been conducted within a one-half mile radius of the current project area. Table 1 summarizes the most relevant studies to the project area. Approximately 20-percent of the one-half mile radius has been previously surveyed. Two survey reports have been conducted within the boundaries of the current project area: Cartier (1983) was conducted in support of the shopping center complex north of Pilarcitos Creek, which is also the location of the proposed entry bore pit and staging area; and another was prepared that covered the southern portion of the project area that includes the staging area and exit bore pit area (Clark 2005). As a result, the entire current project area has been previously surveyed; no cultural resources were identified as a result of these surveys.

Five cultural resources are present within the one-half mile records search radius. There are three prehistoric and one historic-era resources. No cultural resources are documented within project area. The four prehistoric and mixed-component sites identified are located along the banks of Pilarcitos Creek, both west and east of the proposed Project Area.

Historic Map Review

Review of historic maps of the area was completed to better understand the timing of development within the project area and recognize historic features. The following historic maps and references were reviewed as part of this investigation. Eight USGS topographic maps were consulted from 1902 to 1991. The review

of historic maps for this area indicated that no structures or development is evident until 1968, which depicts some residential development to the south of Oak Avenue. The 1991 USGS map depicts the shopping center development north of the river near the north end of the APE.

Field Survey

On May 6, 2020, Alta Archaeological Consulting staff archaeologist Sarah King Narasimha conducted a field survey of the entire APE. Project Maps and aerial imagery were used to correctly identify the project area. Ground surface visibility was extremely poor, less than 5% throughout the project area. A total of 8 shovel and boot scrapes were used to scrape the ground surface to expose mineral soils. The project area was surveyed using intensive pedestrian survey coverage with transects no greater than 10-meter intervals. The entire APE was surveyed including 2.5-acres of land. No resources were found as a result of this pedestrian survey. Digital photos were taken of the project area and surroundings (see Attachment C in the Archaeological Survey Report, Appendix B).

Summary of Cultural Resources Identification Efforts

Through background research, outreach to Native American representatives, and a field survey, no cultural resources were identified in the proposed project site. Therefore, no historical resources or unique archaeological resources, as defined by CEQA, appear to be present in the proposed project site.

Discussion of Impacts

a) **Less than Significant Impact.** Pursuant to State CEQA guideline 15064.5, record searches, field surveys, and research were conducted to determine the potential presence of historic resources as part of the Archaeological Survey Report (Alta 2020). The majority of the APE has undergone previous disturbance as a result of the development in the area for shopping centers and housing development. Although the project is located in an area that would have provided a platform for human occupation to gather and hunt, the area of physical disturbance is minor due to the HDD methods used for pipe installation. In addition, the entry pit for the HDD operation is being conducted in modern fill deposits that have very low archaeological potential; the exit pit would be excavated in soils that have encountered previous disturbance within the vertical excavation proposed, or about 5-ft, with the development of the park and the installation of Oak Avenue. Therefore, the project activities are not anticipated to cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5 (Alta 2020). A less than significant impact would occur.

b, c) **Less than Significant with Mitigation Incorporated.** The proposed Project Area does not contain any known archaeological resources and has a low potential to contain buried cultural deposits or human remains based on past disturbances. However, the project could uncover such materials during construction. Despite the negative findings, the proximity to Pilarcitos Creek and the presence of archaeological sites upstream of the project APE, increases the probability of encountering additional evidence of prehistoric occupation along this riverine corridor. The contractor shall comply with California Health and Safety Code Section 7050.5 and California Public Resources Code Sections 5097.5, 5097.9 et seq., regarding the discovery and disturbance of cultural materials or human remains, should any be discovered during project construction.

Potential impacts on unknown buried cultural resources or human remains would be less than significant with compliance with Mitigation Measure CULT-1.

Mitigation Measure CULT-1: The District or its contractor shall conduct pre-work training so that in the event that soil disturbance uncovers buried archaeological deposits, workers are aware of what a buried deposit might look like and what they need to do.

In keeping with the CEQA guidelines, if previously unidentified cultural resources or archaeological remains are uncovered, work at the place of discovery shall be halted immediately until a qualified archaeologist can evaluate the finds (§15064.5 [f]). Prehistoric archaeological site indicators include but are not limited to obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5 and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location shall be halted in the vicinity of the find, and the county coroner and a qualified archaeologist must be notified immediately so that an evaluation can be performed. If the coroner determines the remains are Native American and prehistoric, the coroner shall contact the Native American Heritage Commission. The Native American Heritage Commission shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.

4.6 ENERGY

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐	1,3,12
b) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒	1,3,12

Environmental Setting

Energy usage is typically quantified using the British thermal unit (BTU). As a point of reference, the approximate amount of energy contained in common energy sources are as follows: gasoline, 115,000 BTUs per gallon; diesel, 138,500 BTUs per gallon; natural gas, 21,000 BTUs per pound; electricity, 3,414 BTUs per kilowatt-hour (kWh) (USDOE 2014a).

Total energy usage in California was 7,640.8 trillion BTUs in 2012, which equates to an average of 201 million BTUs per capita. Of California's total energy usage, the breakdown by sector is 39 percent transportation, 23 percent industrial, 19 percent residential, and 19 percent commercial. Petroleum satisfies 55 percent of California's energy demand, natural gas 32 percent, and electricity 12 percent. Coal fuel accounts for less than one percent of California's total energy demand. Electric power and natural gas in California are generally consumed by stationary users, whereas petroleum consumption is generally accounted for by transportation-related energy use (USDOE 2014b). The other sources are made up of renewable energy sources, which include wind and solar power, among other uses.

Given the nature of the proposed project, the main uses of energy would occur via construction vehicle fuel. These two sources of energy are discussed in further detail in the impacts discussion below.

Discussion of Impacts

a) **Less than Significant Impact.** The proposed project would require the use of diesel and other fuels for trucks and equipment during construction, and these activities would be short-term and completed as efficiently as possible for practical and financial reasons, among other considerations. In 2019, gasoline and diesel consumption for San Mateo County totaled to roughly 314 million gallons (San Mateo County 2021). Fuel consumption associated with the proposed project would mostly result from using an excavator, drill rig, mud mixing plant, separation plant, and worker vehicles. Furthermore, there would be no ongoing energy consumption in the operational phase of the proposed project in excess of the current baseline condition. Fuel consumption associated with the proposed project would therefore be negligible relative to the total fuel consumption in San Mateo County and construction and operation of the proposed project would not result in wasteful,

inefficient, or unnecessary consumption of energy resources. Therefore, impacts in this regard would be less than significant.

b) **No Impact.** The Proposed Project involves replacement of an existing water line, no additional energy would be required for the Project, and the Project would not conflict with state or local renewable energy or energy efficiency plans.

4.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒	3,15
ii) Strong seismic ground shaking?	☐	☐	☒	☐	2, 3,15
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	2, 3,15
iv) Landslides	☐	☐	☒	☐	3,15
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	1
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐	2, 3,8
d) Be located on expansive soil, as defined in Table 18- 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐	2, 3,8
e) Have soils incapable of adequately supporting the use	☐	☐	☐	☒	1

	of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?					
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒	1

Environmental Setting

Regional Geologic Setting

The proposed project is located in the San Francisco Bay Region on the edge of the Coastal Range Geomorphic Province in the eastern foothills of the Santa Cruz Mountains. The local topography is dominated by a series of west-to-southwest trending spur ridges separated by broad swales.

Three major active earthquake faults transect the San Francisco Bay Area trending northwest to southeast. The San Andreas Fault occurs approximately 5.4 miles east of the site. The San Gregorio Fault is located about 1.9 miles west of the site.

Soils and Seismicity

The proposed Project Area has relatively steep topography sloping down from adjacent development towards Pilarcitos Creek, an incised channel. Soils in the proposed Project Area are classified as Farallone coarse sandy loam, sloping, and Gullied land (alluvial soil material).

Farallone loam consists of well-drained, well drained soils that formed in alluvium derived from granitic rocks and is considered a hydric soil. Gullied land is a miscellaneous land type occurring near streams extending through certain soil types, including Farallone, and is considered a hydric soil (USDA 1991).

Significant earthquakes have occurred in this area and strong to violent ground-shaking in the proposed Project Area can be expected as a result of a major earthquake on one of the active faults in the region. The USGS has estimated that there is a 72% chance that a magnitude 6.7 or greater earthquake will occur in the San Francisco Bay Area before 2044. The probability of a 6.7 magnitude or greater earthquake occurring along individual faults was estimated to be 27.4% along the San Andreas Fault and 10% along the San Gregorio Fault (2014 Working Group on California Earthquake Probabilities 2015).

Liquefaction and Lateral Spreading

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes temporary loss of strength, which commonly causes ground displacement or ground failure to occur. Since saturated soils are a necessary condition for liquefaction, soil layers in area where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. The San Mateo County Hazards Mitigation maps indicate that the lowland areas of the City have a very low to low potential for liquefaction.

Discussion of Impacts

a-i) **No Impact.** The proposed Project Area is not located within a State of California designated Alquist-Priolo Earthquake Fault Zone (City of Half Moon Bay 1991). Earthquake fault zones are regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The nearest faults to the proposed Project Area are the San Gregorio Fault Zone and the San Andreas Fault Zone, approximately 1.9 miles west and 5.4 miles east of the proposed Project Area, respectively. No faults cross through the proposed Project Area, and surface rupture associated with a fault is not anticipated in the City.

a-ii) **Less Than Significant Impact**. The proposed Project Area is within 5.4 miles of the San Andreas Fault Zone, one of the most seismically active faults in the world. During a major seismic event on the San Andreas Fault, there is the potential for strong ground shaking that could expose persons and property to undue risks. The proposed Project only involves replacing a water pipeline. It would not involve constructing buildings or other structures that would expose people to strong seismic ground shaking. The Pproject would be designed, engineered, and constructed in conformance with standard engineering practices ~~and California Building Code requirements~~ and geotechnical recommendations listed in the Project Geotechnical Investigation Report. Compliance with these requirements would ensure the proposed Project Area would not expose persons or property to strong seismic ground shaking hazards. Impacts in this regard would be less than significant.

a-iii) **Less Than Significant Impact**. The potential liquefaction from seismic activity is considered moderate in the proposed Project Area based on the geologic units and flat topography. In addition, the ~~p~~Project would follow all ~~is subject to all California Building Code requirements for seismic conditions and would be designed to conform to all building requirements~~ geotechnical recommendations listed in the Project Geotechnical Investigation Report. Impacts associated with seismic ground failure, liquefaction and landslides would be less than significant.

a-iv) **Less Than Significant Impact**. The proposed Project Area contains flat relief, which precludes the possibility of landslides on-site. No impacts in this regard would occur.

b) **Less than Significant Impact.** Construction of the proposed project would involve ground disturbing activities that could potentially create erosion. Approximately 60 cubic yards of material would be disturbed during pipeline installation. The proposed project would be required to comply with the erosion control requirements stipulated in the National Pollution Discharge Elimination System (NPDES) Permit issued by the San Francisco Bay RWQCB. These requirements include the preparation and implementation of a WPCP that contains BMPs designed to control erosion, siltation, and contaminated runoff from construction sites. Typical BMPs include sandbags, detention basins, silt fencing, landscaping, hydroseeding, oil/water separators, storm drain inlet protection, street sweeping, and monitoring of water bodies. The preparation and implementation of the WPCP would ensure potential adverse erosion, siltation, and contamination impacts would not occur during short-term construction. Therefore, the proposed project's impacts would be less than significant.

c, d) **Less than Significant Impact.** The potential for geologic and soil hazards from unstable or expansive soils in the proposed Project Area is considered low based on the geologic units, soil types, and flat topography. The ground disturbance associated with the proposed project would cause soil disturbance, but these actions would not result in substantial changes in topography to ground surface relief features, geologic substructures, or unstable soil conditions, unique geologic or physical features. The proposed Project is subject to all Federal, State, and local regulations and standards for seismic conditions ~~including the Uniform Building Code, California Edition~~ and would be designed to conform to all building requirements and geotechnical recommendations

listed in the Project Geotechnical Investigation Report. Therefore, the proposed projects impacts would not expose human life to hazards and be less than significant.

e) **No Impact.** The proposed Project does not involve construction of septic tanks or alternative wastewater disposal systems.

f) **No impact.** The proposed Project Area does not contain any known paleontological resources or sites or any unique geologic features.

4.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	1
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	1,16

Environmental Setting

Assembly Bill 32, adopted in 2006, established the Global Warming Solutions Act of 2006 which requires the State to reduce GHG emissions to 1990 levels by 2020. Senate Bill 97, adopted in 2007, required the Governor's Office of Planning and Research to develop CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions," and the Resources Agency certified and adopted the amendments to the guidelines on December 30, 2009.

GHGs are recognized by wide consensus among the scientific community to contribute to global warming/climate change and associated environmental impacts. The major GHGs released from human activity are carbon dioxide, methane, and nitrous oxide (Governor's Office of Planning and Research, 2008). The primary sources of GHGs are vehicles (including planes and trains), energy plants, and industrial and agricultural activities (such as dairies and hog farms).

San Mateo County adopted an Energy Efficiency Climate Action Plan (EECAP) in June of 2013. The EECAP is intended to streamline future environmental review of projects in San Mateo County by following CEQA Guidelines and meeting BAAQMD exceptions for a Qualified GHG Reduction Strategy. The EECAP proposes emission reduction measures designed to reduce emissions by 17 percent below 2005 emissions levels by 2020 and sets forth goals, policies, and actions in order to reach this target. Although the EECAP is not required by State law, the BAAQMD has concluded in its 2017 CEQA Guidelines that development projects that are consistent with a qualified Climate Action Plan would not result in significant climate change impacts under CEQA. The Climate Action Plan requires that new development projects must attain higher levels of energy efficiency while incorporating more sustainable design standards. The EECAP provides a Development Checklist to ensure new development projects are compliant with the standards outlined (San Mateo County 2013). The Development Checklist does not apply to this Project because no new development is proposed.

Discussion of Impacts

a) **Less than Significant Impact.** GHG emissions from the Pproject would be produced from construction-related equipment emissions and operation of the pipeline components. During construction, GHG emissions would be generated through the operation of construction equipment

(e.g., excavator, drill rig, front loader, mud mixing plant, and separation plant) and from workers and vendor vehicles, each of which typically use fossil-based fuel to operate. The combination of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. The BAAQMD does not have adopted thresholds of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emission that would occur during construction in relation to meeting Assembly Bill 32 GHG reduction goals. Because Project construction activities would be minor and short term (up to two months), GHG emissions were not quantified and would not interfere with meeting GHG reduction goals and would be well below the BAAQMD operational emissions threshold of 1,100 metric tons CO_2e per year for 2020, or below 660 metric tons CO_2e per year based on the GHG reduction goals of Senate Bill 32 (BAAQMD does not have a recommended post-2020 GHG threshold.). The operation and maintenance of the Project would remain consistent with existing conditions. GHG emissions associated with operation of the project would consist of GHG emissions from electricity consumption to move water through the system. Based on the nature of the ~~p~~Project and short duration of construction, GHG emissions resulting from construction activities would be both minor and temporary. Operational GHG emissions would be the same as existing conditions. While the P~~p~~roject would have an incremental contribution to GHG emissions within the context of the City and region, the individual impact is considered less than significant.

b) **Less than Significant Impact.** The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. GHG emissions from off-road equipment and utility electrical usage are identified and planned for in the BAAQMD's 2017 Clean Air Plan as well as the BAAQMD's Source Inventory of Bay Area Greenhouse Gas Emissions (BAAQMD 2010 and 2017). A primary objective of the 2017 Clean Air Plan is to reduce greenhouse gas 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. Due to the period of relatively short construction activity, the proposed Project would generate emissions similar to existing conditions and, therefore, would not conflict with any applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. Therefore, a less-than-significant impact would occur.

4.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	1
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	1
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐	1
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	☐	☐	☒	☐	9
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒	1
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	1

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☒	☐	☐	1, 15

Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the CCR as follows:

A substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of or otherwise managed. (CCR, Title 22, Section 66261.10)

Chemical and physical properties cause a substance to be considered hazardous. Such properties include toxicity, ignitability, corrosivity, and reactivity (as defined in CCR, Title 22, Sections 66261.20-66261.24). The accidental release of hazardous materials into the environment could potentially contaminate soils, surface water, and groundwater supplies. Under Government Code Section 65962.5, the California Department of Toxic Substances Control (DTSC) maintains a list of hazardous substance sites. This list, referred to as the "Cortese List," includes CALSITE hazardous material sites, sites with leaking underground storage tanks, and landfills with evidence of groundwater contamination.

No hazardous substance sites from the Cortese List have been identified within the proposed Project Area. No hazardous material sites monitored by DTSC on the agency's EnviroStor database have been reported within one-quarter of a mile of the proposed Project Area (Department of Toxic Substances Control 2021).

Discussion of Impacts

a, b) **Less than Significant Impact.** Small amounts of hazardous materials would be used during construction activities for equipment maintenance (e.g., fuel and solvents). Use of hazardous materials would be limited to the construction phase and would comply with applicable local, state, and federal standards associated with the handling and storage of hazardous materials. Hazardous materials would not be stored or used, such as for equipment maintenance, where they could affect nearby land uses. Standard construction measures included in the project description will be implemented to contain any accidental spills of oil and other hazardous materials, and the contractor will be required to ensure that adequate materials are on hand to clean up any accidental spill that may occur. With implementation of these standard measures included in the project description, impacts associated with the use or accidental spill of hazardous materials would be less than significant.

c) **Less than Significant Impact.** The project site is approximately 0.25-mile of the La Costa Adult School, Manuel F. Cunha Intermediate School, and Hatch Elementary School. Although some hazardous materials would be used during construction, given required compliance with applicable state and federal regulations regarding the transport, use and storage of hazardous materials, a spill or accident would have a low potential to affect people at the school. Any spills will be cleaned up immediately, and all wastes and used spill control materials will be properly disposed of at approved disposal facilities. Impacts would be less than significant.

d) **Less than Significant Impact.** The proposed Project Area has not been identified as a hazardous material or clean-up site. If potentially contaminated soil or groundwater is encountered during project excavation work, standard construction measures included in the project description shall be implemented to handle and properly dispose of such materials, and the contractor would be required to ensure that adequate materials are on hand to manage and dispose of any potentially contaminated materials encountered during excavation. Any contaminated soil or groundwater encountered during excavation would be properly disposed of at approved disposal facilities. With implementation of these standard measures, potential impacts associated with encountering contaminated soil or groundwater, if any are encountered, would be less than significant.

e) **No Impact.** The proposed Project Area is not located near a public or private airport. The nearest airport is the Half Moon Bay Airport located approximately 4.5 miles from the proposed Project Area.

f) **Less than Significant Impact**. Construction activities cwould require temporary lane closure. ~~and detours around the work area.~~ Emergency access to or evacuation from surrounding areas would not be restricted during construction. ~~because of the availability of detours, but minor delays may be experienced for access to or evacuation from the land uses adjacent to the work area. The trenches used to install pipe could be quickly covered in the event of an emergency to allow vehicles to drive through the work area, which would ensure the project does not prevent emergency access to the residences or conflict with an emergency response or evacuation plan. Detours will be readily available at all times to allow emergency vehicles access around the work area.~~ The final construction drawings for the Project will show that Oak Avenue would provide adequate width (minimum 20 feet) for emergency vehicles to turn around during construction. ~~With implementation of the traffic control measures included in the Project Description, i~~Impacts would be less than significant.

g. **Less than Significant Impact with Mitigation Incorporated.** Construction activities could temporarily increase the risk of a wildfire start compared to existing conditions. Wildfire risk near the proposed Project Area is pronounced due to the presence of dense vegetation in the project vicinity that could spread wildfire into nearby residential communities. During construction, the presence of motorized equipment on the proposed Project Area during the dry season may lead to a temporary increase in wildfire risk. This could create a significant impact if no mitigation measures were set forth.

Mitigation Measure HAZ-1: During construction activities, the construction contractor shall implement the following BMPs to prevent wildfire hazards:

- Staging areas, welding areas, or areas slated for development using spark producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. The contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.
- No smoking, open flames, or welding shall be allowed in refueling or service areas.
- Service trucks shall be provided with fire extinguishers. A minimum of two fire extinguishers shall be kept on site during proposed project construction.
- Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order.

4.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐	1
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒	1
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:					
i.) Result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐	1
ii.) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐	1
iii.) Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐	1
iv.) Impede or redirect flood flows?	☐	☐	☒	☐	1
d) Result in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐	1

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	1

Environmental Setting

Hydrology in the Pproject aArea is provided by precipitation and overland runoff from adjacent areas. Precipitation for Half Moon Bay was below normal during the 2019/2020 rainy season, defined as October 1 to March 31. During the 2019/2020 rainy season, precipitation was below normal in October, November, and February, with December, January, and March, above normal levels of precipitation (NRCS 2021).

According to the RWQCB's Water Quality Control Plan for the San Francisco Basin, the proposed Project Area is located in the San Mateo Coastal Basin. The proposed Project Area is covered with mostly pervious surfaces, with drainage flowing into existing street culverts. According to the Federal Emergency Management Agency Federal Insurance Rate Maps, the majority of the proposed Project Area is in flood zone X, which is outside the 100-year floodplain (FEMA 2011). Construction activities would be maintained outside of a 15-foot buffer from the creek top of bank in developed or maintained park areas.

Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges in the City (the City is part of the San Mateo Countywide Stormwater Pollution Prevention Program) are regulated under the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP), Order No. R2-2015-0049 as amended by Order No. R2-2019-0004, NPDES Permit No. CAS612008, adopted November 19, 2015. The MRP is overseen by the San Francisco Bay Regional Water Quality Control Board.

Discussion of Impacts

a) **Less than Significant Impact.** Construction activities would require ground disturbance consisting of two bore pits measuring approximately 10 ft long by 10 ft wide by 5 ft deep. Soil removed from the bore pits would be temporarily stockpiled within the proposed Project Area, and, if not properly controlled, soil particles and other materials could be carried in stormwater runoff to downstream drainage facilities, which could degrade water quality in Pilarcitos Creek. Standard construction measures identified in the project description and recommended by the San Mateo Countywide Water Pollution Prevention Program would be implemented during periods of rain to minimize pollutants carried from the proposed Project Area in runoff. The project would comply with terms of the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System Permit. Water quality impacts during construction would be less than significant.

b) **No Impact.** The project would not require use of groundwater supplies or affect groundwater recharge in the area. Implantation of the project would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. No impacts would occur.

c.i-iv) **Less than Significant Impact.** The proposed project would not permanently alter the course of a stream or river, nor would it add substantial impervious surface. The proposed project would not change the existing operation and maintenance activities and therefore these phases of the project would not have an impact on hydrology and water quality. The proposed project would not result in an increase in impermeable surfaces or an increase in runoff compared to existing conditions. The proposed project would not cause a substantial change to the erosion and accretion patterns

long-term because the water line replacement would not alter the existing drainage pattern of the area. Temporary construction impacts related to runoff from grading and cut and fill activities could occur and create a significant impact if not addressed. Proposed project design features, compliance with the San Mateo Countywide Water Pollution Prevention Program, and the City regulations requiring construction BMPs and a NPDES permit for all non-stormwater discharge to the City stormwater system would ensure impacts from runoff would remain less than significant. The proposed project would not add impervious surface or impede flood flows. Both construction and operationally related impacts in these areas would be less than significant.

d, e) ***Less than Significant Impact.*** The proposed project would not have other water quality or groundwater sustainability impacts beyond those discussed above under items a) and b). The proposed Project Area is not located in a tsunami inundation area or seiche zone. The proposed project would comply with the San Mateo Countywide Water Pollution Prevention Program. There would be no operational impacts, and construction impacts would be less than significant.

4.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Physically divide an established community?	☐	☐	☐	☒	1
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	3

Environmental Setting

The proposed Project Area is in a developed area of the City. Existing land uses adjacent to the proposed Project Area consist of commercial and residential development. The proposed Project Area largely follows existing roads and their associated rights-of-way and includes an approximately 110-foot reach of Pilarcitos Creek and portions of Oak Avenue, and Pilarcitos Avenue. The City's General Plan/LCP, adopted in ~~1993~~ 2020 with various subsequent chapter amendments, provides policies and implementation strategies for management of the resources and land uses in the City, and the City Codes provide restrictions and requirements to protect resources and comply with local, state, and federal laws. No habitat conservation plans have been adopted for the area.

Regulatory Setting

City of Half Moon Bay Local Coastal Program and Land Use Plan

On April 15, 2021, the California Coastal Commission (CCC) certified the updated Half Moon Bay Local Coastal Program (LCP). The Half Moon Bay Land Use Policies and Map constitute the Land Use Plan (LUP) of the LCP. The Zoning Code (Title 18 of the Municipal Code, including Chapter 18.20, which regulates Coastal Development Permits) together with the Zoning District Map constitutes the Implementation Plan of the LCP. The next step is to update the Implementation Plan to ensure consistency with the updated LUP. At this time, the City has not completed the update of the zoning code. Consequently, in some cases there may be inconsistencies between the older zoning code regulations and the newly amended LUP policies. If inconsistencies between updated policies and zoning code regulations occur, the updated LUP takes precedence over the zoning code. The primary goal of the LCP is to ensure that the local government's land use plans, zoning ordinances, zoning maps, and implemented actions meet the requirements of the provisions and polices of the ~~California Coastal Commission's (~~CCC~~)~~'s Coastal Act at the local level. Coastal Resource Conservation Standards are described in Chapter 6 of the LUP and Chapter 18.38 of the LCP Municipal Code and define sensitive habitat and coastal resource areas for conservation to include: sand dunes; marine habitats; sea cliffs; riparian areas; wetlands, coastal tidelands and marshes, lakes, ponds, and adjacent shore habitats; coastal or off-shore migratory bird nesting sites; areas used for scientific study, refuges, and reserves; habitats containing unique or rare and endangered species; rocky intertidal zones; coastal scrub communities; wild strawberry habitat; and archaeological resources. ~~Marine and water resources (including riparian habitats).~~

Policy 1-23: ~~Where there are conflicts between the policies set forth in the Coastal Land Use element and other elements of the City's General Plan or existing ordinances, on balance, the policies of this Coastal Land Use Element shall take precedence~~**Coastal Resources Protection Priorities.** Protection of ESHA, public access and other coastal resources are a high priority for the City. To the extent that any polices in this Land Use Plan (which serves as the City's General Plan Land Use Element) and other elements of the City's General Plan are ambiguous, the City shall interpret them in the way that best protects ESHA and other coastal resources and maximizes public access. In advance of updating the Implementation Plan for conformance with the polices for the 2020 Land Use Plan, the polices of the Land Use Plan shall provide the standard of review for any proposed new development, including where these polices are more protective of ESHA and other coastal resources and maximize public access as consistent with the Coastal Act.

Policy 3-5: **Coastal Development Permit for Public Works.** Require any public utility, government agency, or special district proposing a development project in the City to obtain a coastal development permit, unless explicitly exempted by the LCP, Coastal Act, or other controlling law.

Policy 3-7: **System Improvements.** Allow system improvements to occur to address health and safety needs such as replacing aging infrastructure; ensuring sufficient water capacity for fire flow; improving system capacity to prevent sewer overflows; using green infrastructure in public and private development projects to prevent erosion, sedimentation, or flooding; and providing passing lanes for emergency vehicles. Such improvements are intended to address health, safety, and changing design standards, shall not be growth inducing, shall be phased if they constitute a significant system update, and shall comply with Policy 3-1.

Policy 3-16: **Phased Development of Water Supply Facilities.** For development of new water supply infrastructure within the city limits and/or subject to City issuance of a coastal development permit, support phased development of water supply facilities (e.g. water storage tanks and treatment facilities) so as to avoid growth-inducing impacts, and ensure that new development is consistent with Policy 2-26 (Fiscally Sustainable Development); so long as adequate capacity is provided to meet City needs, including emergency response, needs described in the LUP's development policies, and allocations for Coastal Act and Local Priority Uses.

Policy 3-18: **Emergency Water Supply and Storage Capacity.** For development of new water supply infrastructure within the city limits and/or subject to City issuance of a coastal development permit that results in expanded water supply, system conveyance capacity, and/or storage capacity that support emergency risk management, ensure such infrastructure is adequately designed to protect public health and safety and is not used to support unanticipated development.

Policy 6-46: **Riparian Corridors Definition.** Riparian corridors are defined on the ground by an association of native, and in some cases non-native, plant and animal species within or adjacent to a watercourse that contribute to the function or distinction of the riparian habitat. Boundaries of riparian corridors are determined by the limit of riparian vegetation or top of bank, or other confining topography, whichever is greater. The limit of riparian vegetation is determined by the drip line of riparian canopy trees or the limit of riparian shrubs or herbaceous vegetation.

Policy 6-47: **Permitted Uses in Riparian Corridor.** Permit only the following uses within riparian corridors:

a. Education and research activities;
b. Consumptive uses as provided for in the Fish and Game Code and Title 14 of the California Administrative Code;
c. Habitat restoration and fish and wildlife management activities; and
d. Necessary water supply projects.

Where no feasible alternative exists, permit the following uses:

e. Stream-dependent aquaculture, provided that any non-stream-dependent facilities are located outside of the corridor;
f. Flood, sedimentation, or erosion control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development;
g. Bridges providing an important public transportation or resource-dependent function where supports do not significantly impact the riparian corridor or its resources, such as free-span designs;
h. Pipelines and stormwater runoff facilities;
i. Repair, maintenance, or incidental improvement of roadways or road crossings that do not increase the capacity of the roadway;
j. Existing agricultural uses; and
k. New agricultural uses, including agricultural irrigation conveyance systems, provided no riparian vegetation is removed and no soil, nutrients, waste, or other material is allowed to enter stream channels.

Policy 6-49: Riparian Corridor Buffers. Buffer zones shall be required for development proposed along both sides of riparian corridors to provides habitat protection and space for meander belts and vegetation growth. Riparian buffer zones shall apply as follows:

a. For all perennial watercourses (i.e. Pilarcitos Creek, Frenchmans Creek, Arroyo Leon, and Arroyo Cañada Verde west of Highway 1) and certain intermittent watercourses (i.e. Kehoe Watercourse and Wavecrest Arroyo): buffer zones shall extend a minimum of 50 feet from the outer limit of the riparian vegetation or 100 feet from the top of bank, whichever is greater.
b. For all other intermittent and ephemeral watercourses with riparian vegetation (e.g. Roosevelt Creek, the riparian corridor in the northwestern area of Ocean Colony, and Arroyo Cañada Verde east of Highway 1): buffer zones shall extend a minimum of 35 feet from the outer limit of riparian vegetation or the top of bank, whichever is greater.

Policy 6-51: Permitted Uses within Riparian Corridor Buffer Zones. Permit only the following uses in riparian corridor buffer zones:

a. Uses permitted in riparian corridors pursuant to Policy 6-47;
b. Public scenic overlooks;
c. Existing agriculture, providing no existing riparian vegetation is removed and no soil is allowed to enter stream channels;
d. Infrastructure improvements that protect public safety and property and that also restore the hydrological function of the watercourse;
e. Temporary disruption (e.g. less than six months) for the construction, alteration, repair and maintenance of existing or newly permitted facilities or structures if there are no feasible alternatives and the disruption is repaired and restored to at least an equivalent condition; and
f. Native landscaping.

~~**Policy 3-4:** (a) Permit only resource- dependent or other uses which will not have a significant adverse impact in sensitive habitats.~~

~~(b) In all sensitive habitats require that all permitted uses comply with U.S. Fish and Wildlife and State Department Fish and Game regulations.~~

~~**Policy 3-9:** (a) Within corridors, permit only the following uses: (1) education and research, (2) consumptive uses as provided for in the Fish and Game Code and Title 14 of the California Administrative Code, (3) fish and wildlife management activities, (4) trails and scenic overlooks on public lands(s), and (5) necessary water supply projects.~~

~~**Policy 3-11:** (a) For all perennial watercourses (i.e., Pilarcitos Creek, Frenchmans Creek, Arroyo Leon, and Arroyo Cañada Verde west of Highway 1) and certain intermittent watercourses (i.e., Kehoe Watercourse and Waveerest Arroyo): buffer zones shall extend a minimum of 50 feet from the outer limit of the riparian vegetation or 100 feet from the top of bank, whichever is greater.~~

~~(b) For all other intermittent and ephemeral watercourses with riparian vegetation (e.g., Roosevelt Creek, the riparian corridor in the northwestern area of Ocean Colony, and Arroyo Cañada Verde east of Highway 1): buffer zones shall extend a minimum of 35 feet from the outer limit of riparian vegetation or the top of bank, whichever is greater.~~

~~**Policy 10-1:** After certification of the LCP, the City shall require a permit from any public utility, government agency, or special district wishing to undertake development in the City, with the exceptions of State Universities and Colleges and development on public trust lands or tidelands as described in section 30519(b) of the California Coastal Act.~~

~~**Policy 10-2:** As a condition of permit approval, special districts, public utilities, and other government agencies shall conform to the City's zoning ordinance and the policies of this plan.~~

~~**Policy 10-9:** The City will support an increase in the water supply or capacity which will prove for, but not exceed, the amount needed to support build-out of the Land Use Plan of the City and County within the Coastside County Water District.~~

~~**Policy 10-10:** The City shall support phased development of water supply facilities (chiefly pumping stations and water treatment) so as to minimize the financial burden on existing residents and avoid growth-inducing impacts, so long as adequate capacity is provided to meet City needs in accordance with the phased development policies (including expected development to the year 2000) and allocations for the floriculture uses.~~

~~**Policy 10-11:** The City will support expansion of water supplies by those sources and methods which produces the highest quality water available to the area in order to assure the highest possible quality to horticulture. All such supplies shall, at minimum, meet potable water standards for domestic use and highest practicable quality for floriculture.~~

Discussion of Impacts

a) **No Impact.** The project involves construction of a replacement ~~an~~ underground water pipeline and utility infrastructure primarily along existing right-of-way in an urban area. The project would not physically divide an established community. No impact would occur.

b) **Less Than Significant Impact**. A proposed project would have a significant impact if it were to conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, LCPs, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. The proposed project is subject to several local policies, plans, and regulations, as described above. These proposed project actions would not conflict with the City's General Plan/LCP or other applicable plans or policies.

The proposed project is consistent with Water Supply Policies in the City's LCP, including Policies ~~10-9, 10-10~~3-16, and ~~10-11~~3-18. It replaces an existing water transmission pipeline and therefore does not increase or expand the water supply available to the District. The new pipe would be sized to match the 8-inch inner diameter of the existing piping. Impacts would be less than significant.

4.12 MINERAL RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒	3
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒	3

Environmental Setting

The State Surface Mining and Reclamation Act of 1975 requires the State Geologist to classify mineral areas in the state, and the State Mining and Geology Board to designate mineral deposits of regional or statewide significance. No locally important mineral resources are designated in the City's General Plan (City of Half Moon Bay 1991). The proposed Project Area is located in a developed parcel of land within the City, adjacent to Pilarcitos Creek and otherwise surrounded by existing development.

Discussion of Impacts

a, b) **No Impact.** The proposed Project Area is not in or adjacent to any important mineral resource areas. Furthermore, the development of the proposed project would not preclude future excavation of oil or minerals should such extraction become viable. As such, there would be no loss of availability of known mineral resources and no impact to mineral resources.

4.13 NOISE

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the project result in:					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐	1,3,14
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐	1
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	1

Environmental Setting

Basics of Noise

Sound is described in terms of loudness and pitch. The standard unit for measuring loudness is the decibel (dB), which is quantified on a logarithmic scale. The human ear is not equally sensitive to a given sound level at all pitches. A special pitch-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by approximating the sensitivity of the human ear.

Noise is typically defined as unwanted sound. A typical noise environment consists of a base of steady background noise from many distant and indistinguishable noise sources. Superimposed on this background noise is sound from individual local sources, which may be intermittent or continuous. Several rating scales have been developed to analyze the adverse effect of noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is dependent on the energy of noise itself as well as time of day. Noise scales that are applicable to this analysis are as follows:

L_{eq} – An L_{eq}, or equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. The L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the

same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

CNEL – The Community Noise Equivalent Level is a 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 P.M. to 10:00 P.M. and a 10 dBA "weighting" added to noise during the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.

For residential uses, environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA (Governor's Office of Planning and Research 2003) Noise levels greater than 85 dBA can cause temporary or permanent hearing loss. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA).

It is widely accepted that in the community noise environment the average healthy ear can barely perceive CNEL noise level changes of 3 dBA. CNEL changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA CNEL increase is readily noticeable, while the human ear perceives a 10 dBA CNEL increase as a doubling of sound.

Noise levels from a particular source generally decline as distance to the receptor increases. Other factors, such as the weather and reflecting or barriers, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels are also generally reduced by 1 dBA for each 1,000 ft of distance due to air absorption. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The normal noise attenuation within residential structures with open windows is about 17 dBA, while the noise attenuation with closed windows is about 25 dBA (National Cooperative Highway Research Program 1971).

Noise Environment

The City's Noise Ordinance limits construction hours to 7 a.m. to 6 p.m. Monday through Friday; 8 a.m. to 6 p.m. Saturdays; and 10 a.m. to 6 p.m. Sundays and holidays. However, the District will voluntarily limit construction to the hours of 8 a.m. to 6 p.m. Monday through Friday. The Director of Public Works/City Engineer may grant exemptions. Noise in the proposed Project Area and vicinity is primarily from commercial development, residences, and vehicular traffic along roads. The nearest sensitive noise receptors are the businesses in the Strawflower Village Shopping Center and the residences along Oak Avenue and Pilarcitos Avenue.

Discussion of Impacts

a) **Less than Significant with Mitigation Incorporated.** In the long term, the proposed ~~p~~Project would not generate any noise. The proposed P~~p~~roject would not change the existing operation and maintenance activities and therefore these phases of the ~~p~~Project would not have an impact on temporary increases in ambient noise. Water line replacement would maintain existing infrastructure and habitat and would not introduce any new noise-generating land uses.

During construction, the proposed ~~p~~Project would require the use of motorized equipment such as a mini excavator, a pumper truck, and a portable drill rig. The City has not adopted construction noise impact thresholds, but rather requires that all construction be completed during weekdays between 7 a.m. and 6 p.m., on Saturdays between 8 a.m. and 6 p.m., and on Sundays and holidays between 10 a.m. and 6 p.m. unless otherwise approved in writing by the City Director of Public Works/City Engineer. The proposed ~~p~~Project would comply with these working hours. Municipal Code Section 8-1.08. There are two residences located less than 50 ft away from proposed ~~p~~Project work activities and staging, without topography or other obstacles to buffer the noise from this equipment. Construction equipment would generate temporary noise in excess of 75 dBA at these residences. This level of noise is generally considered high for residential areas. As noted above, the City does not have an established noise level limit. Nonetheless, to minimize construction-related noise, Mitigation Measure NOISE-1 requires use of proper muffling equipment and prohibits unnecessary vehicle idling, among other noise-reducing procedures. Furthermore, construction would be limited to weekday, daytime hours, resulting in minimal disturbance to nearby residents. With implementation of Mitigation Measure NOISE-1, adherence to construction work windows, and due to the short-term nature of the impacts (construction is anticipated to be completed in 20 workdays), the proposed project would not result in a substantial temporary or permanent increase in ambient noise in excess of established standards. Impacts would be less than significant with mitigation incorporated.

Mitigation Measure NOISE–1: The District shall incorporate the following practices, in addition to those listed in the project description, into the construction documents to be implemented by the project contractor:

- ~~Construction hours shall be limited to 7 a.m. to 6 p.m. Monday through Friday; 8 a.m. to 6 p.m. Saturdays; and 10 a.m. to 6 p.m. Sundays and holidays unless otherwise approved in writing by the City Director of Public Works/City Engineer.~~

- Notify businesses, residences, and noise-sensitive land uses adjacent to construction sites of the construction schedule in writing. Designate the District's construction manager as responsible for responding to any local complaints about construction noise. The construction manager shall determine the cause of the noise complaints (for example starting too early, or a bad muffler) and institute reasonable measures to correct the problem. Conspicuously post ~~a~~ telephone number<u>s</u> for the construction manager<u>, the City, and the District</u> at the construction site.

- Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures:

    - ~~o~~ Use heavy-duty mufflers for stationary equipment~~ and barriers around particularly noisy areas of the site or around the entire site~~;

    - ~~o Use shields, impervious fences, or other physical sound barriers to inhibit transmission of noise to sensitive receptors;~~

- Locate stationary equipment to minimize noise impacts on the community; and
- Minimize backing movements of equipment.

- ~~Use quiet construction equipment whenever possible.~~

- Impact equipment (e.g., jack hammers and pavement breakers) shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. Compressed air exhaust silencers shall be used on other equipment. Other quieter procedures, such as drilling rather than using impact equipment, shall be used whenever feasible.

- Prohibit unnecessary idling of internal combustion engines.

b) **Less than Significant Impact.** Ground-borne vibration is typically associated with blasting operations, the use of pile drivers, and large-scale demolition activities, none of which are anticipated for the construction or operation of the proposed project. As such, no excessive ground-borne vibrations would be generated by the proposed project and these impacts would be less than significant.

c) **No Impact.** The nearest airport to the proposed Project Area is Half Moon Bay Airport, located approximately 4.5 miles to the northwest. This distance precludes the possibility of the proposed Project Area being adversely exposed to aviation noise. No impacts in this regard would occur.

4.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒	1
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	1

Environmental Setting

Half Moon Bay is located on the Pacific Coast approximately 28 miles south of San Francisco and lies within the westernmost portion of San Mateo County. According to the 2015-2023 Housing Element the population of Half Moon dropped from 11,842 to 11,228 between 2000 and 2011 (City of Half Moon Bay 2015b) U.S. Census data estimated populations of 11,324 in 2010 and 12,932 in 2019 (USCB 2020) Half Moon Bay has approximately 4,429 housing units with an average household size of 2.8 persons (Dyett & Bhattia 2014).

Discussion of Impacts

a, b) **No Impact.** The project would not alter the location, distribution, density, or growth rate of the population and would not result in direct or indirect impacts to population growth. As the project replaces existing pipeline infrastructure with no material increase in capacity, it would not have any impact on population and housing.

4.15 PUBLIC SERVICES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which would cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:					
i) Fire protection?	☐	☒	☐	☐	1
ii) Police protection?	☐	☒	☐	☐	1
iii) Schools?	☐	☐	☐	☒	1
iv) Parks?	☐	☐	☐	☒	1
v) Other public facilities?	☐	☐	☐	☒	1

Environmental Setting

Fire Protection

The City utilizes fire protection from the Coastside Fire Protection District and law enforcement services through the San Mateo County Sheriff's Department. The Coastside Fire Protection District serves the communities of City, the unincorporated areas of Half Moon Bay and the unincorporated communities of Miramar, El Granada, Princeton-by-the-Sea, Moss Beach, and Montara with three stations, one of which is located within Half Moon Bay. The station is located approximately 1.2 miles southeast of the proposed Project Area.

Police Protection

Law enforcement services in the City are provided through a contract with the San Mateo County Sheriff's office. The closest substation to the proposed Project Area is located approximately 0.1 mile southeast of the proposed Project Area.

Schools

The project falls within the Cabrillo Unified School District (CUSD). The CUSD provides public education to roughly 3200 students in four elementary, one middle and two high schools in the City. The project site is approximately 0.25-mile from the La Costa Adult School, Manuel F. Cunha Intermediate School, and Hatch Elementary School.

Parks

The proposed Project Area is adjacent to Oak Avenue Park which is a neighborhood park comprised of grassy area, picnic tables, and restrooms. Construction would temporarily affect use of an open area in Oak Park and restoration of those park facilities is part of the project. Provisions for access to the City owned bridge across Pilarcitos Creek would also be made, through temporary closure of that access would be required during the short-lived (one day) pipe-pulling processes.

Other Public Facilities

The proposed Project Area is located approximately 0.5 miles northwest of Half Moon Bay Public Library and approximately 0.24 miles northwest of San Mateo Coastside Clinic.

Discussion of Impact

a.i-ii) **Less than Significant with Mitigation Incorporated.** Given the proposed project would not permanently increase the existing residential or employment population in the City, it would not result in a long-term increase in the demand for public services or require construction of new governmental facilities. The purpose of the project is to improve water system infrastructure. Therefore, no impacts related to schools, parks or other public facilities would occur. However, there is the potential for construction activities to slow emergency response times. Implementation of Mitigation Measure TRAFFIC-1 would reduce potentially significant impacts related to Fire Protection District and Sheriff Department response times to a less-than-significant levels.

a.iii-v) **No Impact.** Given the proposed project would not permanently increase the existing residential or employment population in the City, the proposed project would not result in a long-term increase in the demand for public services such as schools, parks, or other public facilities or require construction of new facilities. No impact would occur.

4.16 RECREATION

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒	1
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒	1

Environmental Setting

The proposed Project Area is adjacent to Oak Avenue Park which is a neighborhood park comprised of grassy area, picnic tables, and restrooms. Project construction would temporarily affect use of an open area in Oak Park; however, restoration of those park facilities is part of the proposed project. Provisions for access to the City owned bridge across Pilarcitos Creek would also be made, through temporary closure of that access would be required during the short-lived (one day) pipe-pulling processes.

Discussion of Impacts

a, b) **No Impact.** Given the proposed project would not permanently increase the existing residential or employment population in the City, the project would not affect recreational facilities or increase the use of nearby recreational facilities. The purpose of the project is to improve the water infrastructure system and it does not include recreational facilities or require the construction or expansion of recreational facilities. No Impacts would occur.

4.17 TRANSPORTATION

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☒	☐	1
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3(b)?	☐	☐	☒	☐	1
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐	1
d) Result in inadequate emergency access?	☐	☒	☐	☐	1

Discussion of Impacts

a) ***Less than Significant Impact.*** Construction traffic (equipment and materials transport and daily worker traffic) would slightly increase traffic on local roads during the temporary construction phase of the proposed project. Temporary construction traffic would be limited to equipment delivery and material transport, and a few employee vehicles on a daily basis. The temporary construction-related traffic would not result in a noticeable increase in traffic on local roads and is not expected to reduce the level of service (LOS) for local intersections. Large vehicles transporting equipment and materials to the proposed Project Area could cause slight delays for travelers as the construction vehicles stop to unload. Temporary lane closures could also require motorists to ~~detour around the proposed Project Area or~~ expect delays while traveling through the proposed Project Area. Welding of the HDPE pipe will occur in the HDD staging area along the east side of Pilarcitos Avenue until 24-hours prior to pullback. Pilarcitos Avenue will not be blocked except for brief periods of equipment movement or materials delivery. Traffic control measures described in the project description would be in place during the construction phase to alert motorists to potential delays ~~and identify detour routes~~, as described in the project description. With these measures and the temporary nature of construction-related traffic, impacts on traffic would be less than significant.

b) ***Less than Significant Impact.*** A significant impact may occur if the adopted California Department of Transportation (Caltrans) and San Mateo County Congestion Management Agency thresholds for a significant project impact would be exceeded. To address the increasing public concern that traffic congestion is impacting the quality of life and economic vitality of the State of California,

the Congestion Management Program (CMP) was enacted by Proposition 111. The CMP designated a transportation network including all State highways and some arterials within the County to be monitored by local jurisdictions. If the LOS standard deteriorates on the CMP network, then local jurisdictions must prepare a deficiency plan to be in conformance with the CMP program.

As discussed above, the proposed project would not permanently increase traffic on local roads or highways to a level that would affect intersection LOS. The proposed project would not result in long-term traffic increases. Impacts would be less than significant.

c) ***Less than Significant Impact.*** A significant impact may occur if a project were to include a new roadway design, introduce a new land use or permanent project features into an area with specific transportation requirements and characteristics that have not been previously experienced in that area, or if project access or other features were designed in such a way as to create hazardous conditions. The project would not involve new road construction or activities that could increase hazards due to a design feature or incompatible uses. Upon completion, the project would return all roadways to existing conditions. Adequate sight distance would be available for motorists to access and depart the proposed Project Area. Impacts would be less than significant.

d) ***Less than Significant with Mitigation Incorporated.*** ~~Construction activities would require temporary lane closures and detours around the work area.~~ The construction contractor would be required to maintain a minimum road width of 20 feet to facilitate emergency vehicle access. ~~Minor delays may be experienced for emergency access to the residences adjacent to the work area. Detours would be available throughout the construction period in the event of an emergency to allow vehicles to drive around the work area. The trenches used to install pipe could be quickly covered in the event of an emergency to allow vehicles to drive through the work area, which would ensure the project does not prevent emergency access to nearby properties.~~ This is a short-term construction related impact that would cease upon project completion. Implementation of Mitigation Measures TRAFFIC-1 would reduce this impact to less than significant.

Mitigation Measure TRAFFIC-1:

- Local emergency services shall be notified prior to construction to inform them that traffic delays may occur, and also of the proposed construction schedule.
- The District shall require the contractor to provide for passage of emergency vehicles through the proposed Project Area at all times.
- The District shall require the contractor to maintain access to all residences during project construction.

4.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☒	☐	☐	1
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	☐	☒	☐	☐	1
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☒	☐	☐	1

This section examines the potential impacts of the proposed project on tribal cultural resources. Much of the background context and methods used for the analysis of potential impacts from the proposed project on tribal cultural resources and cultural resources are the same.

For the purposes of this analysis, the term *tribal cultural resource* is defined as follows:

Sites, features, places, cultural landscapes, sacred places, and objects with cultural value

to a California Native American tribe that are listed, or determined to be eligible for listing, in the National Register, California Register, or a local register of historical resources.

The term indigenous, rather than prehistoric, is used in this section as a synonym for "Native American–related". This section relies on the information and findings presented in *Archaeological Survey Report, EKI CCWD Pilarcitos Creek Crossing* (Alta 2020). That report, provided in Appendix B, details the results of the cultural resources study, which examined the environmental, ethnographic, and historic background of the proposed project site, emphasizing aspects of human occupation.

Environmental Setting

Native American Consultation

The NAHC was contacted via email to request a review of the Sacred Lands file and to request a list of Native American contacts in this area on February 16, 2020. The response letter dated February 24, 2020, by Sarah Fonseca (Cultural Resource Analyst) indicated that the search of the Sacred Lands File had a **positive** result. The NAHC response letter suggested that the lead agency contact the Ohlone tribe to provide further information regarding this result and to inquire about any further consultation. The District is considered the responsible party to further conduct Native American consultation. Attachment B contains the results of the Native American communication.

Records Search

On February 18, 2020, Alex DeGeorgey, archaeologist with ALTA, conducted a records search (File Number 19-1414) at the NWIC located on the campus of Sonoma State University. The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historical records and reports for an 18-county area that includes San Mateo County. The records search included a review of all study reports on file within a one-half mile radius of the project area. A search of cultural resources included a one- half mile radius. Sources consulted include archaeological site and survey base maps, survey reports, site records, historic General Land Office maps.

Included in the review were:

- California Inventory of Historical Resources (California Department of Parks and Recreation 1976)
- California Historical Landmarks for San Mateo County (CA-OHP 1990)
- California Points of Historical Interest (CA-OHP 1992)
- Historic Properties Directory Listing (CA-OHP April 2012)
- Historic Properties Directory includes the National Register of Historic Places (April 2012) of the California Historical Landmarks and California Points of Historical Interest

Review of historic registers and inventories indicate that no historical resources are present in the project area. No National Register listed or eligible properties are located within the 0.5-mile visual area of the APE.

A review of archaeological site and survey maps at the NWIC reveal that 25 cultural resources studies have been conducted within a one-half mile radius of the current project area. Table 1 summarizes the most relevant studies to the project area. Approximately 20-percent of the one-half mile radius has been

previously surveyed. Two survey reports have been conducted within the boundaries of the current project area: Cartier (1983) was conducted in support of the shopping center complex north of Pilarcitos Creek, which is also the location of the proposed entry bore pit and staging area; and another was prepared that covered the southern portion of the project area that includes the staging area and exit bore pit area (Clark 2005). As a result, the entire current project area has been previously surveyed; no cultural resources were identified as a result of these surveys.

Five cultural resources are present within the one-half mile records search radius. There are three prehistoric and one historic-era resources. No cultural resources are documented within project area. The four prehistoric and mixed-component sites identified are located along the banks of Pilarcitos Creek, both west and east of the proposed Project Area.

Historic Map Review

Review of historic maps of the area was completed to better understand the timing of development within the project area and recognize historic features. The following historic maps and references were reviewed as part of this investigation. Eight USGS topographic maps were consulted from 1902 to 1991. The review of historic maps for this area indicated that no structures or development is evident until 1968, which depicts some residential development to the south of Oak Avenue. The 1991 USGS map depicts the shopping center development north of the river near the north end of the APE.

Field Survey

On May 6, 2020, Alta Archaeological Consulting staff archaeologist Sarah King Narasimha conducted a field survey of the entire APE. Project Maps and aerial imagery were used to correctly identify the project area. Ground surface visibility was extremely poor, less than 5% throughout the project area. A total of 8 shovel and boot scrapes were used to scrape the ground surface to expose mineral soils. The project area was surveyed using intensive pedestrian survey coverage with transects no greater than 10-meter intervals. The entire APE was surveyed including 2.5-acres of land. No resources were found as a result of this pedestrian survey. Digital photos were taken of the project area and surroundings (see Attachment C in Appendix B, Archaeological Survey Report).

Summary of Tribal Cultural Resources Identification Efforts

Through outreach to Native American representatives, background research, and a field survey, no tribal cultural resources, including any archaeological resources or human remains that may qualify as tribal cultural resources, were identified in the proposed project site. Therefore, no tribal cultural resources, as defined by CEQA, appear to be present in the proposed project site.

Regulatory Setting

California Environmental Quality Act

CEQA (codified at PRC Section 21000 *et seq.*) is the principal statute governing environmental review of proposed projects occurring in California. CEQA requires lead agencies to determine whether a project would have a significant effect on the environment, including a significant effect on tribal cultural resources. Under CEQA (PRC Section 21084.1), a project that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment.

Assembly Bill 52 and Tribal Cultural Resources

AB 52, enacted in September 2014, recognizes that California Native American Tribes have expertise with regard to their tribal history and practices. The law established a new category of cultural resources, tribal cultural resources, in CEQA to consider tribal cultural values when determining the impacts of proposed projects on cultural resources (PRC Section 21080.3.1, 21084.2, and 21084.3). PRC Section 21074(a) defines a tribal cultural resource as any of the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    - included or determined to be eligible for inclusion in the California Register; or
    - included in a local register of historical resources, as defined in PRC Section 5020.1(k).
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of [PRC] Section 5024.1. In applying these criteria, the lead agency would consider the significance of the resource to a California Native American tribe.

A cultural landscape that meets the criteria of PRC Section 21074(a) is also a tribal cultural resource if the landscape is geographically defined in terms of the size and scope. A historical resource as described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2, or a non-unique archaeological resource as defined in PRC Section 21083.2 may also be a tribal cultural resource under CEQA if it meets the criteria identified in PRC Section 21074(a).

AB 52 requires CEQA lead agencies to analyze the impacts of proposed projects on tribal cultural resources separately from impacts on archaeological resources (PRC Section 21074 and 21083.09) because archaeological resources have cultural values beyond their ability to yield data important to prehistory or history. AB 52 also defines tribal cultural resources in a new section of the PRC (Section 21074; see above). Lead agencies must engage in additional consultation with California Native American Tribes (PRC Section 21080.3.1, 21080.3.2, and 21082.3).

The provisions of AB 52 apply to proposed projects for which a notice of preparation or notice of negative declaration/mitigated negative declaration was filed on or after July 1, 2015. As such, AB 52 applies to the proposed project.

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the California Register are based upon the criteria for listing on the National Register (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a cultural resource must be significant at the local, State, and/or federal level under one or more of the following four criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must be of sufficient age and retain enough of its historic character or appearance (integrity) to convey the reason for its significance. Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed on the National Register and those formally Determined Eligible for the National Register;
- California Registered Historical Landmarks from No. 770 onward; and
- Those California Points of Historical Interest that have been evaluated by the California Office of Historic Preservation and have been recommended to the State Historical Commission for inclusion on the California Register.

Other resources that may be nominated to the California Register include:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the National Register, the California Register, and/or a local jurisdiction register);
- Individual historic resources;
- Historic resources contributing to historic districts; and
- Historic resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

California Public Resources Code Section 5097

PRC Section 5097.99, as amended, states that no person shall obtain or possess any Native American artifacts or human remains that are taken from a Native American grave or cairn. Any person who knowingly or willfully obtains or possesses any Native American artifacts or human remains is guilty of a felony, which is punishable by imprisonment. Any person who removes, without authority of law, any such items with an intent to sell or dissect or with malice or wantonness is also guilty of a felony which is punishable by imprisonment.

California Native American Historic Resource Protection Act

The California Native American Historic Resources Protection Act of 2002 imposes civil penalties, including imprisonment and fines up to $50,000 per violation, for persons who unlawfully and maliciously excavates upon, removes, destroys, injures, or defaces a Native American historic, cultural, or sacred site that is listed or may be listed in the California Register.

California Health and Safety Code § 7050.5

HSC Section 7050.5 protects human remains by prohibiting the disinterring, disturbing, or removing of human remains from any location other than a dedicated cemetery. PRC Section 5097.98 (and reiterated in CCR Section 15064.59[e]) also identifies steps to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery.

Discussion of Impacts

a, a.i-ii) **Less than Significant Impact with mitigation incorporated.** The proposed project would not change the existing operation and maintenance activities and therefore these phases of the project would not have an impact on tribal cultural resources. Outreach to Native American representatives, background research, and a field survey conducted for the proposed project identified no tribal cultural resources, as defined in PRC Section 21074, in the proposed project site. Therefore, the proposed project is not anticipated to impact any tribal cultural resources.

Although the proposed project is not anticipated to impact any tribal cultural resources, there remains the possibility that previously unrecorded archaeological deposits, including human remains, are present in the proposed project site. If such deposits are present and were found to qualify as tribal cultural resources, as defined in PRC Section 21074, any impacts of the proposed project on the resource would be potentially significant. The contractor shall comply with California Health and Safety Code Section 7050.5 and California Public Resources Code Sections 5097.5, 5097.9 et seq., regarding the discovery and disturbance of cultural materials or human remains, should any be discovered during project construction. Such potentially significant impacts would be reduced to less-than-significant with implementation of Mitigation Measure CULT-1.

4.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
Would the Project:					
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒	1
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒	1
c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒	1
d) Generate solid waste in excess of State or local standards, or in excess of the capacity or local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐	1
e) Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐	1

Environmental Setting

The following information on the utilities and service systems that serve the proposed Project Area is from the Existing Conditions Report (Dyett & Bhattia, 2014) prepared as part of the City's General Plan update planning process.

Potable Water

The water distribution system in the project area is owned and operated by the District, which also serves part of the unincorporated area of San Mateo County, including Princeton-by-the-Sea, Miramar, and El Granada. The District's water supply sources include Pilarcitos Lake, Upper Crystal Springs Reservoir, Pilarcitos Well Field, and Denniston Creek. The primary water supply is purchased from the San Francisco Public Utilities Commission (Pilarcitos Lake and Upper Crystal Springs Reservoir), and other supplies (about 28 percent) are Infiltration Well water from the District's Pilarcitos well field and surface water and groundwater from the District's Denniston Project. Water is delivered to the system through one of two treatment plants: the Denniston Water Treatment Plant near Half Moon Bay Airport and the Nunes Water Treatment Plant in Half Moon Bay. The water distribution system consists of 11 treated water storage tanks, which have a combined storage capacity of 8.1 million gallons, and over 100 miles of transmission and distribution pipelines (CCWD 2021a, 2021b)

Wastewater Treatment

Sanitary sewer service is provided to the proposed Project Area by the City for transporting sewage flows and by Sewer Authority Mid-Coastside for treating and disposing the sewage. The City's existing sanitary sewer system consists of approximately 37 miles of sewer mains, approximately 3,100 laterals, and three lift stations (City of Half Moon Bay 2010). The wastewater treatment plant's current capacity is 4.0 million gallons per day (MGD) in Average Dry Weather Flow (ADWF). The 2008 Sewer System Management Plan indicates the treatment plant's current ADWF is 1.5 MGD (SAM 2014; Dyett and Bhattia 2014).

Stormwater Drainage

Stormwater drainage in the City is conveyed through the City's creeks and drainages into Half Moon Bay. Stormwater from the proposed Project Area drains into Pilarcitos Creek.

Solid Waste and Recycling

Allied Waste Services is Half Moon Bay's franchised hauler, providing residential curbside collection of recyclables and green waste (yard waste), and commercial collection for recyclables. The majority of the city's solid waste is directed to the Corinda Los Trancos Sanitary Landfill (known as Ox Mountain), which is a Class III disposal facility located at 12310 San Mateo Road (State Route 92). As of July 2013, engineering estimates provided by the landfill operator, Republic Services, indicated that the facility's remaining disposal capacity was approximately 26.5 years. Based on the current rate of all disposal at this site from all jurisdictions, the facility's projected closure date is estimated to occur in 2038 (Dyett & Bhattia 2014).

Discussion of Impacts

a, b, c) **No Impact.** Potable water will be used during the construction as a component of the drilling mud used to remove soil cuttings, support the walls of the borehole, and cool the cutting tools. Operation of the pipeline would not generate wastewater or consume potable water. The project would not alter stormwater drainage because once the new pipeline is installed, the project area would be recontoured to preconstruction conditions. As a result, the project would have no impacts related to 1) exceedance of wastewater treatment requirements; 2) physical impacts from new storm drainage facilities; 3) water supply; and 4) wastewater treatment capacity.

d, e) **Less than Significant Impact.** The project would generate a small quantity of soil spoils and solid waste from HDD tunneling, but all generated waste would be properly disposed or recycled in a nearby landfill or approved disposal facility with capacity to receive the waste. Any materials used

during construction would be properly disposed of in accordance with federal, state, and local regulations. The California Integrated Waste Management Board Solid Waste Information System (SWIS) indicates solid waste from the City is landfilled at the Ox Mountain Sanitary Landfill, located two miles northeast of Half Moon Bay. Impacts in this regard would be less than significant.

4.20 WILDFIRE

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
If located in or near State Responsibility Areas or lands classified as very high fire hazard severity zones, would the Project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐	1
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐	1
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary on ongoing impacts to the environment?	☐	☐	☒	☐	1
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐	1

Environmental Setting

In order to quantify potential risk of wildfires, the California Department of Forestry and Fire Protection (Cal Fire) has developed a Fire Hazard Severity Scale that utilizes three criteria to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). The project is not within a State Responsibility Area (SRA) nor is it located within land classified as a Very High Fire Hazard Severity Zone (VHFHSZ). However, it is located approximately 0.6 miles northwest of a SRA ranked as a High Fire Hazard Severity Zone and Local Responsibility Area classified as a VHFHSZ (Cal Fire 2021).

Discussion of Impacts

a) **Less than Significant with Mitigation Incorporated.** The proposed Project Area is between a residential neighborhood to the south and a commercial development to the north. The residential streets are, therefore, designed to accommodate minimal through-traffic. Oak Avenue and Pilarcitos Avenue are two-lane streets with street parking on both sides. The east side of Pilarcitos Avenue would be used as a laydown area to pre-fabricate the new pipe before pullback. During construction hours, it is possible that on-site construction equipment could temporarily obstruct emergency response in the event of an evacuation or should emergency vehicles require passage, creating a potentially significant impact. Mitigation Measure TRAFFIC-1 requires notification of emergency service providers 72 hours prior to the start of construction and compliance with the City recommended traffic BMPs during construction, minimizing the risk of obstructing emergency access. The mitigation measure would ensure that the project remains compliant with the Local Hazard Mitigation Plan which serves as the emergency response and evacuation plan in the City. The proposed project would, therefore, not lead to physical modification or obstruction of emergency response infrastructure such as communication systems or roadways. As such, the proposed project would not impair implementation of or physically interfere with implementation of an emergency response or evacuation plan in a VHFHSZ, and impacts would be less than significant with mitigation incorporated.

b) **Less than Significant with Mitigation Incorporated.** Fire risk within and adjacent to the proposed Project Area is pronounced due to the presence of dense vegetation in the creek bed and on adjoining parcels. This risk is further exacerbated by the presence of narrow residential roadways that could slow down evacuation procedures in the event of a fire. The proposed project would not increase fire risk in the operational phase, as no new structures or fuel sources would be introduced to the proposed Project Area and the proposed project would not draw new people who would be exposed to fire risk to the area.

In the short-term, the presence of motorized equipment during the dry season may lead to a small, temporary increase in fire risk. This would have the potential to cause a significant impact if a fire were to start in the creek bed and spread to other areas unchecked. Mitigation Measure HAZ-1 requires that the contractor remove potential fuel sources such as dried vegetation and requires provision of fire extinguishers for service trucks, among other fire risk-reducing measures. This mitigation measure would ensure that impact potential is abated. With implementation of Mitigation Measure HAZ-1, the proposed project would not exacerbate wildfire risks, and thereby expose proposed project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts would accordingly be less than significant with mitigation incorporated.

c) **Less than Significant.** The proposed project would not require installation of any infrastructure that may exacerbate fire risk such as power lines or utilities; nor would it require installation of infrastructure intended to reduce wildfire risk or facilitate emergency response such as rods, fuel breaks, or emergency water sources. The proposed project is a water line replacement, which would not have any long-term impact on wildfire risk. Short-term increases in wildfire risk during construction would not be sufficiently severe or occur over a long enough period to require installation of risk attenuating infrastructure. As the proposed project would not require installation or maintenance of associated infrastructure that may exacerbate fire risk or result in temporary or ongoing environmental impacts, there would be a less than significant impact.

d) **Less than Significant.** The proposed project would not change the existing operation and maintenance activities and therefore these phases of the project would not have an impact on wildfire. Thus, impacts would be less than significant.

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Source
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	1
b) Does the project have impacts that are individually limited, but cumulatively-considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐	1
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐	1

Discussion of Impacts

a) **Less than Significant with Mitigation Incorporated**. The incorporation of the mitigation measures included in Section IV (Biological Resources) would reduce potential impacts to a less-than-significant levels. The proposed Project Area does not contain any resource listed in, or determined to be eligible by, the State Historical Resource Commission and does not contain a resource included in a local register of historic resources or identified as significant in a historical resource survey. Additionally, the proposed Project Area does not contain any object, building, structure, site, area, place, record, or manuscript that a lead agency determined to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural,

educational, social, political, military, or cultural annals of California. However, cultural resources could potentially be uncovered during construction. Mitigation measures CULT-1 would reduce potential impacts to a less-than-significant level.

b) **Less Than Significant Impact with Mitigation Incorporated**. Cumulatively considerable means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. The analysis within this Initial Study demonstrates that the project would not have any individually limited, but cumulatively considerable impacts. As presented in the analysis in Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Noise, Public Services, and Transportation/Traffic sections, any potentially significant impacts would be less than significant after mitigation. Due to the limited scope of direct physical impacts to the environment associated with construction, the project's impacts are project-specific in nature. Consequently, the project will create a less than significant cumulative impact with respect to all environmental issues.

c) **Less than Significant Impact.** With implementation of the various construction measures and BMPs included in the proposed project description, the proposed Project would not result in substantial adverse effects to human beings, either directly or indirectly.

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5.0 REFERENCES

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6.0 REPORT PREPARATION

6.0 REPORT PREPARATION

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APPENDIX A – BIOLOGICAL RESOURCES EVALUATION

Biological Resources Evaluation

Coastside County Water District Water Line Replacement Under Pilarcitos Creek Project

Half Moon Bay, San Mateo County, California

Prepared for:

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WRA #29375
Revised June 2021

wra
ENVIRONMENTAL CONSULTANTS

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DEFINITIONS

Study Area: The area throughout which the assessment was performed, inclusive of approximately 10.91 acres spanning across portions of the following parcel numbers (APNs): 056-300-150, 056-300-210, 056-040-999, 056-141-970, and 056-141-950. The Study Area includes a 200-foot buffer around the Project Area.

Project Area: The area encompassing the 0.61-acre proposed Water Line Replacement under Pilarcitos Creek Project.

LIST OF ACRONYMS

BRE	Biological Resources Evaluation
CCC	California Coastal Commission
CCR	California Code of Regulations
CCWD	Coastside County Water District
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFP	California Fully Protected Species
CFR	Code of Federal Regulations
City	City of Half Moon Bay
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California Red-legged Frog
CSRL	California Soils Resources Lab
CWA	Clean Water Act
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
HDD	Horizontal Directional Drilling
HDPE	High-density Polyethylene
LCP	Local Coastal Program
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation & Management
MBTA	Migratory Bird Treaty Act
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
NPPA	California Native Plant Protection Act
NRCS	Natural Resource Conservation Service
NWPL	National Wetland Plant List
OHWM	Ordinary High Water Mark
PRC	Public Resources Code
psi	Pounds Per Square Inch
Rank	California Rare Plant Ranks
RWQCB	Regional Water Quality Control Board
SFGS	San Francisco Garter Snake
SSC	Species of Special Concern
SWRCB	State Water Resource Control Board
TOB	Top of Bank
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

WBWG	Western Bat Working Group
WPT	Western Pond Turtle
WRA	WRA, Inc.

1.0 INTRODUCTION

On January 14, 2021, WRA, Inc. (WRA) conducted a Biological Resources Evaluation (BRE) at the site of the proposed Coastside County Water District (CCWD) Water Line Replacement under Pilarcitos Creek Project (Project), located in Half Moon Bay, San Mateo County, California (Figure 1, Appendix A). An approximately 10.91-acre Study Area was evaluated, including an approximately 0.61-acre Project Area. The Project involves installation of an approximately 450-foot long pipeline using horizontal directional drilling (HDD), with approximately 50 feet under Pilarcitos Creek. The HDD line would pass beneath Pilarcitos Creek and associated riparian habitat.

1.1 Overview and Purpose

This report provides an assessment of biological resources within the Study Area. This report describes the results of the site visit, which assessed the Study Area for the (1) potential to support special-status plant or wildlife species and (2) presence of other sensitive biological resources protected by local, state, or federal laws and regulations. The regulatory framework of this BRE is provided in Section 2.0 of this report. The methods used in the assessment are described in Section 3.0, and the results of the site visit are presented in Section 5.0. A summary of potential impacts to sensitive habitats and species and recommended avoidance, minimization, and mitigation measures is provided in Section 6.0.

The purpose of the site visit and report is to identify, describe, and map any sensitive habitats, including riparian and wetland areas or other Environmental Sensitive Habitat Area (ESHA), and "rare, threatened, or endangered" species, which may occur in the Study Area. WRA performed the biological resources evaluation in accordance with the City of Half Moon Bay (City) Local Coastal Program (LCP), including Section 18.38.035 of the Zoning Code LCP Implementation Plan (City of Half Moon Bay 2011) and Chapter 3 of the Land Use Plan (LUP, City of Half Moon Bay 1993). This report also contains an evaluation of potential impacts to special-status species or ESHAs that may occur as a result of the proposed Project and potential mitigation measures to compensate for those impacts. This assessment is based on information available at the time of the study and on site conditions that were observed on the dates the site was visited. Conclusions are based on currently available information used in combination with the professional judgement of the biologists completing this study.

1.2 Project Description

The Project involves installation of approximately 450 linear feet of 8-inch water supply pipeline at minimum 20 feet under the bed of Pilarcitos Creek using HDD. The pipeline would extend from the Strawflower Village Shopping Center in the north to Oak Avenue and Oak Avenue Park in the south. HDD is a trenchless construction method whereby a pipe is installed in an arcing drill path to pass under a conflicting feature, such as Pilarcitos Creek. HDD is typically a three-phase process. The first phase involves setting up a drill rig on one side of the crossing and drilling a pilot hole from a small entry pit in front of the rig. The entry pit contains drilling fluids comprised of a mixture of water and bentonite clay. The bore begins with a vertical tangent to quickly gain depth, then arcs into a horizontal section under the creek, before following an upward path to the exit point. Another small pit at the exit point contains fluids to facilitate the reaming and pullback operations.

The second phase involves enlarging the pilot hole using reaming equipment to expand the diameter of the hole required for pipeline pullback, typically 1.5 times the pipe diameter. The larger borehole allows for the flow of drilling fluids around the pipe to reduce friction so the pipe can be pulled through. The

pipe is delivered in sections, then butt-fused together so it is fully assembled before pullback begins. This process necessitates the large linear staging area along Pilarcitos Avenue.

The third phase involves pulling back the fully assembled pipe through the enlarged hole from the exit point back to the drill rig at the entry pit. Pullback is typically completed without interruption. Drilling mud, typically a mixture of water and bentonite or polymer, is used to remove the soil cuttings, support the walls of the borehole, and cool the cutting tools. Mixing systems are used to mix the drilling fluid additives with water to achieve the fluid properties appropriate for the site-specific geology. On-site separation plants are used to remove soil cuttings and recycle drilling fluids. All fluids are contained at the entry and exit pits. Spill facilities and equipment are stationed nearby to insure on-site fluid containment.

The new pipe would be sized to match the 8-inch inner diameter of the existing piping. The new pipe would be somewhat flexible, high-density polyethylene (HDPE). The pipe's working pressure would be approximately 100 pounds per square inch (psi) at the bottom of the proposed bore path (where pressure is the highest) and could accommodate increased working pressures up to approximately 150 psi. The new pipe would be installed at minimum 20 feet below the creek bed.

HDD activities would occur at minimum 20 feet below the bed of Pilarcitos Creek and associated riparian habitat. All equipment, staging, and the entry and exit pits would be located above the top of bank (TOB) and outside the riparian corridor. Temporary foot traffic would occur within the riparian corridor and below the TOB to check the alignment of the HDD. Erosion controls would be maintained throughout the duration of construction activities. The approximate duration of HDD work is two weeks, including mobilization and demobilization.

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological evaluation, including applicable laws and regulations that were applied to the field investigations and analysis of potential Project impacts.

The California Environmental Quality Act (CEQA) provides protections for particular vegetation types defined as sensitive by the California Department of Fish and Game (CDFW), and aquatic communities protected by laws and regulations administered by the U.S. Army Corps of Engineers (Corps), State Water Resources Control Board (SWRCB), and Regional Water Quality Control Boards (RWQCB). The laws and regulations that provide protection for these resources are summarized below.

2.1 Sensitive Natural Communities:

Sensitive natural communities include habitats that fulfill special functions or have special values, such as wetlands, streams, and riparian habitat. These habitats are regulated under federal regulations (such as the Clean Water Act [CWA]), state regulations (such as the Porter-Cologne Act, Section 1600 of the California Fish and Game Code (CFGC)), and local ordinances or policies (such as City or County Tree Ordinances, Special Habitat Management Areas, applicable LCPs, and General Plan Elements).

Sensitive natural communities also include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" (CDFW 2020; CDFW 2021) and keeps records of their occurrences in its California Natural Diversity

Database (CNDDB; CDFW 2021). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2021) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or U.S. Fish and Wildlife Service (USFWS) must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). In addition, this general class includes oak woodlands that are protected by local ordinances under the Oak Woodlands Protection Act. Recommended avoidance and minimization measures for impacts to these communities are discussed in Section 6 of this report.

2.2 Federal Jurisdiction over Wetlands and Non-Wetland Waters

Section 404 of the CWA gives the Environmental Protection Agency (EPA) and the Corps regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States." Section 502(7) of the CWA defines "navigable waters" as "waters of the United States, including territorial seas." The Navigable Waters Protection Rule: Definition of ''Waters of the United States'' published April 21, 2020, and effective June 22, 2020 (Federal Register Vol. 85, No. 77), provides the final rule defining the scope of waters federally regulated under the CWA. Section 328 of Chapter 33 in the Code of Federal Regulations (CFR) defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the CWA. The definition of "waters of the United States" in 33 CFR 328.3 is:

(1) The territorial seas and traditional navigable waters;
(2) Perennial and intermittent tributaries that contribute surface water flow to such waters;
(3) Certain lakes, ponds, and impoundments of jurisdictional waters;
(4) Wetlands adjacent to other jurisdictional waters.

The Navigable Waters Protection Rule clarifies that the following are not considered waters of the U.S.:

(a) Groundwater, including groundwater drained through subsurface drainage systems;
(b) Ephemeral features that flow only in direct response to precipitation, including ephemeral streams, swales, gullies, rills, and pools;
(c) Diffuse stormwater runoff and directional sheet flow over upland;
(d) Ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations.
(e) Prior converted cropland;
(f) Artificially irrigated areas that would revert to upland if artificial irrigation ceases;
(g) Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters;
(h) Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose obtaining fil, sand, or gravel;
(i) Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off;
(j) Groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters;
(k) Waste treatment systems.

Wetlands. Wetlands are defined in 33 CFR 328.3 (b) as:

> *…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the Corps *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Delineation Manual* for the respective region (Arid West or Western Mountains and Valleys for California). As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

Non-Wetland Waters. The limit of federal jurisdiction in non-tidal non-wetland waters extends to the OHWM which is defined in 33 CFR 328.3 (e) as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

2.3 State Jurisdiction over Wetlands and Non-Wetland Waters

2.3.1 State and Regional Water Quality Control Boards

The Porter-Cologne Water Quality Control Act gives the SWRCB authority to regulate discharge of dredged or fill material that may affect the quality of "waters of the state". "Waters of the State" are defined broadly as:

> *any surface water or groundwater, including saline waters, within the boundaries of the state.*

The SRWQCB and nine RWQCBs protect waters within this broad regulatory scope through many different regulatory programs. Waters of the State in the context of a CEQA Biological Resources Evaluation include wetlands and other surface waters protected by the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. In April 2019 the SWRCB adopted the State Wetland Policy, which provides a State wetland definition, procedures and requirements for regulation of the discharge of dredge or fill material to wetlands and non-wetland waters of the State. The State Wetland Policy also includes exemptions from regulation of dredge and fill discharges for certain types of wetland and waters features, as well as for certain classes of activities, such as activities covered by an existing RWQCB or SWRCB Order. The state wetland definition that became effective May 28, 2020 is similar to, but slightly different from that used by the Corps:

> *An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*

The State Wetland Definition and Procedures utilize existing Corps delineation procedures (Environmental Laboratory 1987, (U.S. Army Corps of Engineers (Corps) 2008). According to the State Wetland Policy, the SWRCB and RWQCBs generally rely on the Corps for verification of wetland and waters as part of an aquatic resource report. Any potential wetland area not identified in a report verified by the Corps is required to be delineated using Corps methods for consideration as a state wetland and verification by SWRCB or RWQCB staff. Some features mapped as non-wetland waters under the Corps wetland definition may be considered wetlands under the State definition.

This report identifies wetlands and non-wetland waters according to the Corps definitions and criteria, consistent with the State Wetland Policy's reliance of these criteria. This report also recognizes that some non-wetland waters features may meet the wetland definition of the State Wetland Policy. Regardless of how they are defined, wetlands and non-wetland waters deemed jurisdictional may be regulated by the RWQCB and/or SWRCB under the State Wetland Policy.

2.3.2 California Department of Fish and Wildlife

Streams and lakes, as habitat for fish and wildlife species, are regulated by CDFW under Sections 1600-1616 of CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). The term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). Riparian vegetation has been defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

2.4 California Coastal Commission / Half Moon Bay Local Coastal Program

On April 15, 2021, the California Coastal Commission (CCC) certified the updated Half Moon Bay LCP. The Half Moon Bay Land Use Policies and Map constitute the LUP of the LCP. The Zoning Code (Title 18 of the Municipal Code, including Chapter 18.20, which regulates Coastal Development Permits) together with the Zoning District Map constitutes the Implementation Plan of the LCP. The next step is to update the Implementation Plan to ensure consistency with the updated LUP. At this time, the City has not completed the update of the zoning code. Consequently, in some cases there may be inconsistencies between the older zoning code regulations and the newly amended LUP policies. If inconsistencies between updated policies and zoning code regulations occur, the updated LUP takes precedence over the zoning code. The primary goal of the LCP is to ensure that the local government's land use plans, zoning ordinances, zoning maps, and implemented actions meet the requirements of the provisions and polices of the CCC Coastal Act at the local level. Coastal Resource Conservation Standards are described in Chapter 6 of the LUP and Chapter 18.38 of the Municipal Code and define sensitive habitat and coastal resource areas for conservation to include: sand dunes; marine habitats; sea cliffs; riparian areas; wetlands, coastal tidelands and marshes, lakes, ponds, and adjacent shore habitats; coastal or off-shore migratory bird nesting sites; areas used for scientific study, refuges, and reserves; habitats containing unique or rare and endangered

species; rocky intertidal zones; coastal scrub communities; wild strawberry habitat; and archaeological resources.

2.4.1 California Coastal Commission/Local Coastal Program Jurisdiction over Wetlands

The Coastal Act and LCP regulate the diking, filling, or dredging of wetlands within the coastal zone. Section 30121 of the Coastal Act defines "wetlands" as land "which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens." In addition, the Half Moon Bay LCP defines "wetlands" as an area where the water table is at, near, or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants, which normally are found to grow in water or wet ground. Wetlands do not include vernally wet areas where the soils are not hydric. The 1981 CCC Statewide Interpretive Guidelines state that hydric soils and hydrophytic vegetation "are useful indicators of wetland conditions," but the presence or absence of hydric soils and/or hydrophytes alone are not necessarily determinative when the CCC identifies wetlands under the Coastal Act.

The boundaries of areas regulated by the Corps and CCC/LCP are often not the same due to the differing goals of the respective regulatory programs and because these agencies use different definitions for determining the extent of wetland areas. For example, the Corps requires that positive indicators for the presence of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation be present for an area to meet the Corps' wetland definition. The CCC does not necessarily require that all three wetland indicators (wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation) be present for an area to be determined to by a "wetland"; rather, the presence of hydric soils in the absence of a predominance of hydrophytes (or vice versa) could be sufficient for a positive wetland determination.

2.4.2 The California Coastal Commission Environmentally Sensitive Habitat Area Definition

The CCC defines an ESHA as follows:

> "*Environmentally sensitive habitat area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.*"

The CCC Guidelines contain definitions for specific types of ESHAs, including: wetlands, estuaries, streams and rivers, lakes, open coastal waters and coastal waters, riparian habitats, other resource areas, and special-status species and their habitats. For the purposes of this report, WRA has taken into consideration any areas that may meet the definition of any ESHA defined by the CCC guidelines or the Half Moon Bay LCP.

2.4.3 Half Moon Bay Buffer Zones

Applicable Half Moon Bay LUP policies establish buffer zones around riparian corridors as follows.

> *(a)) For all perennial watercourses (i.e. Pilarcitos Creek, Frenchmans Creek, Arroyo Leon, and Arroyo Cañada Verde west of Highway 1) and certain intermittent watercourses (i.e.*

Kehoe Watercourse and Wavecrest Arroyo): buffer zones shall extend a minimum of 50 feet from the outer limit of the riparian vegetation or 100 feet from the top of bank, whichever is greater.

(b) For all other intermittent and ephemeral watercourses with riparian vegetation (e.g. Roosevelt Creek, the riparian corridor in the northwestern area of Ocean Colony, and Arroyo Cañada Verde east of Highway 1): buffer zones shall extend a minimum of 35 feet from the outer limit of riparian vegetation or the top of bank, whichever is greater.

Permitted uses within buffer zones include education and research, consumptive uses as provided for in the CFGC, fish and wildlife management activities, trails and scenic overlooks on public lands, and necessary water supply projects.

2.4.4 Coastal Development Permit Exemption

Half Moon Bay Municipal Code Section §18.20.030.2 exempts projects from Coastal Development Permit requirements if they do not result in an addition to, or expansion of an existing facility. Sections 18.20.030.3 (a) and (c) specifically exempt utility projects. No Coastal Development Permit is required if the project entails installation, maintenance, and minor alteration of utilities that do not increase capacity or are required to restore service to prevent service outages. However, pursuant to PRC §13252(3), exempt projects may not include the following activities within 50 feet of environmentally sensitive habitat areas and 20 feet from coastal waters or streams: the placement or removal of rip-rap, rocks, sand, beach materials or any other form of solid materials; or, the use of mechanized equipment. Therefore, the Project does not qualify for a Coastal Development Permit exemption because it involves the placement or removal of solid material or the use of mechanized equipment within 50 feet of environmentally sensitive habitat areas (see Section 6.1).

2.5 Special-status Species

Endangered and Threatened Plants, Fish, and Wildlife. Specific species of plants, fish, and wildlife species may be designated as threatened or endangered by the federal Endangered Species Act (ESA), or the California Endangered Species Act (CESA). Specific protections and permitting mechanisms for these species differ under each of these acts, and a species' designation under one law does not automatically provide protection under the other.

The ESA (16 USC 1531 et seq.) is implemented by the USFWS and the National Marine Fisheries Service (NMFS). The USFWS and NMFS maintain lists of "endangered" and "threatened" plant and animal species (referred to as "listed species"). "Proposed" or "candidate" species are those that are being considered for listing, and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. Take under the ESA is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in "take" of an ESA-listed species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federally listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features “essential to the conservation of the species”. Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

The CESA (California Fish and Game Code 2050 et seq.) prohibits a "take" of any plant and animal species that the California Fish and Game Commission determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to “candidate species” which are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

Fully Protected Species and Designated Rare Plant Species. This category includes specific plant and wildlife species that are designated in the CFGC as protected even if not listed under CESA or the ESA. Fully Protected Species includes specific lists of birds, mammals, reptiles, amphibians, and fish designated in CFGC. Fully protected species may not be taken or possessed at any time. No licenses or permits may be issued for take of fully protected species, except for necessary scientific research and conservation purposes. The definition of "take" is the same under the California Fish and Game Code and the CESA. By law, CDFW may not issue an Incidental Take Permit for Fully Protected Species. Under the California Native Plant Protection Act (NPPA), CDFW has listed 64 “rare” or “endangered” plant species, and prevents “take”, with few exceptions, of these species. CDFW may authorize take of species protected by the NPPA through the Incidental Take Permit process, or under a NCCP.

Special Protections for Nesting Birds and Bats. The federal Bald and Golden Eagle Protection Act provides relatively broad protections to both of North America’s eagle species (bald [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*)] that in some regards are similar to those provided by the ESA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) provides for conservation and management of fishery resources in the U.S., administered by NMFS. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g. eelgrass (*Zostera* spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

Species of Special Concern, Movement Corridors, and Other Special Status Species under CEQA. To address additional species protections afforded under CEQA, CDFW has developed a list of special species as "a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status." This list includes lists developed by other organizations, including for example, the Audubon Watch List Species, the Bureau of Land Management Sensitive Species, and USFWS Birds of Special Concern. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1 and 2, as well as some with a Rank of 3, are also considered special-status plant species and must be considered under CEQA. Some Rank 3 species and all Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. Some species listed in the *Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties (web application)* (Lake 2021) are considered sensitive (see Section 2.2). Additionally, any species listed as sensitive within local plans, policies and ordinances are likewise considered sensitive. Movement and migratory corridors for native wildlife (including aquatic corridors) as well as wildlife nursery sites are given special consideration under CEQA.

3.0 ASSESSMENT METHODOLOGY

On January 14, 2021, WRA biologists visited the Study Area to map vegetation, aquatic communities, unvegetated land cover types, document plant and wildlife species present, and evaluate habitat on site, including ESHA, for the potential to support special status species as defined by CEQA. Prior to the site visit, WRA biologists reviewed literature resources and performed database searches to assess the potential for sensitive biological communities (e.g., wetlands) and special-status species (e.g., endangered plants), including:

- Soil Survey San Mateo Area, California (USDA 1961; CSRL 2021)
- Half Moon Bay 7.5-minute quadrangle (USGS 2018)
- Contemporary aerial photographs (Google 2021)
- Historical aerial photographs (Historical Aerials 2020)
- National Wetlands Inventory (USFWS 2021a)
- California Aquatic Resources Inventory (SFEI 2017)
- California Natural Diversity Database (CNDDB; CDFW 2021)
- California Native Plant Society Electronic Inventory (CNPS 2020a)
- A Manual of California Vegetation Online (CNPS 2020b)
- Consortium of California Herbaria (CCH 2020)
- USFWS Information for Planning and Consultation (USFWS 2021b)
- CDFW Publication, California Bird Species of Special Concern in California (Shuford and Gardali 2008)
- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- Preliminary Descriptions of the Terrestrial Natural Communities (Holland 1986)
- California Natural Community List (CDFW 2018)

Database searches (i.e., CNDDB, CNPS, IPaC) focused on the Half Moon Bay and surrounding five USGS 7.5-minute quadrangles for special-status plants and wildlife.

Following the remote assessment, WRA biologists completed a field review over the course of one day to document: (1) land cover types (e.g., terrestrial communities, aquatic resources, ESHA), (2) existing conditions and to determine if such provide suitable habitat for any special-status plant or wildlife species, and (3) if and what type of aquatic natural communities (e.g., wetlands) are present.

3.1 Vegetation Communities and Other Land Cover Types

During the site visit, WRA evaluated the species composition and area occupied by distinct vegetation communities, aquatic communities, and other land cover types. Mapping of these classifications utilized a combination of aerial imagery and ground surveys. In most instances, communities are characterized and mapped based on distinct shifts in plant assemblage (vegetation), and follow the California Natural Community List (CDFW 2018), Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986), and A Manual of California Vegetation, Online Edition (CNPS 2020b). Vegetation alliances (natural communities) with a CDFW Rank of 1 through 3 (globally critically imperiled (S1/G1), imperiled (S2/G2), or vulnerable (S3/G3), were evaluated as sensitive as part of this evaluation (CDFG 2010).

The site was delineated for the presence of wetlands and other aquatic resources on January 14, 2021 according to the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West/Western Mountains and Valleys Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Areas meeting these indicators were mapped as aquatic resources and categorized using the vegetation community classification methods described above. Aquatic communities which are mapped in the NMFS Essential Fish Habitat Mapper (NMFS 2021), or otherwise meet criteria for designation as Essential Fish Habitat are indicated as such in the community description below in Section 5.1. The presence of riparian habitat was evaluated based on woody plant species meeting the definition of riparian provided in *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607, California Fish and Game Code* (CDFG 1994) and based on best professional judgement of biologists completing the field surveys.

3.2 Wetland Delineation Methodology

WRA biologists performed a delineation of aquatic resources within the Study Area on January 14, 2021. Prior to conducting the evaluation, WRA reviewed the literature resources listed above. In addition, LIDAR data were reviewed to plan the site visit and as a reference during the site visit. During the on-site evaluation, WRA followed the methods outlined in the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Supplement; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States ("OHWM Guide"; Lichvar and McColley 2008).

Data on vegetation, hydrology, and soils were collected during the evaluation and recorded. Potentially jurisdictional wetlands were identified and their boundaries mapped using the Routine Method described in the Corps Manual. The jurisdictional limits of non-wetland waters under Section 404 of the CWA were mapped based on a combination of field indicators described in the OHWM Guide. Where direct access to the OHWM and TOB was not feasible, the location was hand drawn in the field on aerial photographs with LIDAR for subsequent digitizing in ArcGIS. The total acreage of potential jurisdictional waters was

measured digitally using ArcGIS software. Indicators described in the Corps Manual that were used to make wetland or waters determinations in the Study Area and are summarized below.

Routine Method. WRA followed the Routine Method to evaluate the Study Area for the presence or absence of indicators of the three wetland parameters described in the Corps Manual and Arid West Supplement. Prior to conducting the evaluation, available reference materials listed above were reviewed. Data on vegetation, hydrology, and/or soils were collected at sample points within potential wetland communities and adjacent upland areas. Except in cases of atypical or problematic wetland situations, sample points that lacked one or more indicators were considered to be upland.

3.2.1 Waters of the United States

The Study Area was evaluated for the presence of wetlands and non-wetland waters.

Wetlands

The Corps has defined the term "wetlands" as follows:

> *…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The basis for determining whether a given area is a wetland for the purposes of Section 404 of the CWA is outlined in the Corps Manual and Arid West Supplement. As defined in 33 CFR 328.4 (c), the extent of federal jurisdiction within wetlands is defined as extending to the limit of the wetland as determined using the methods outlined in the manuals.

The three parameters listed in the Corps Manual that are used to determine the presence of wetlands are: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual:

> *"...[E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland delineation."*

Vegetation. Plant species observed in the Study Area were identified using the Jepson eFlora (Jepson Flora Project 2021). Plants were assigned a wetland indicator status according to the National Wetland Plant List (NWPL; Lichvar 2012).

Hydrology. The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (a minimum of 14 consecutive days in the Arid West region). Evidence of wetland hydrology can include primary indicators, such as visible inundation or saturation, drift deposits, oxidized root channels, and salt crusts, or secondary indicators such as the FAC-neutral test, presence of a shallow aquitard, or crayfish burrows.

Soils. Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Hydric soils can have a hydrogen sulfide (rotten egg) odor, low chroma matrix color, generally designated 0, 1, or 2, used to identify them as hydric, presence of redox concentrations, gleyed or depleted matrix, or high organic matter content.

The Natural Resource Conservation Service defines a hydric soil as follows:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
>
> Federal Register July 13, 1994,
> U.S. Department of Agriculture, NRCS

The Arid West Supplement provides a list of 23 of these hydric soil indicators that are known to occur in the Arid West region.

Non-wetland Waters

The Study Area was also evaluated for the presence of "non-wetland waters". Non-wetland waters subject to Corps jurisdiction include lakes, rivers, and perennial or intermittent streams. Corps jurisdiction of non-wetland waters in non-tidal areas extends to the OHWM, defined as:

> *The term "ordinary high water mark" means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*
>
> Federal Register Vol. 51, No. 219,
> Part 328.3 (d). November 13, 1986.

Non-wetland waters are identified in the field by the presence of a defined river or streambed, a bank, and evidence of the flow of water, or by the absence of emergent vegetation in ponds or lakes. Assessment of the OHWM followed the OHWM Guide.

3.2.2 Waters of the State

State and Regional Water Quality Control Board

The SWRCB and RWQCB have not established a formal wetland definition nor have they developed a wetland delineation protocol; however, these agencies generally adhere to the same delineation protocol set forth by the Corps (U.S. Army Corps of Engineers, Environmental Laboratory 1987). Therefore, the methods used to determine potential Waters of the State were the same as those described above for potential Waters of the U.S. Potential SWRCB and RWQCB jurisdiction along streams in the Study was mapped to the TOB elevation and inclusive of adjacent riparian vegetation.

California Department of Fish and Wildlife

CDFW jurisdiction over lakes and streams extends to the TOB of the stream, or the edge of riparian

vegetation as determined by edge of dripline, whichever is further. Areas of potential CDFW jurisdiction under sections 1600-1616 of the CFGC were identified in the field.

3.2.3 California Coastal Commission/Local Coastal Program Jurisdiction

The Study Area is within the City LCP boundaries; potential wetlands, waters, and riparian areas and will be analyzed in accordance with the LCP definitions.

Wetlands

The Coastal Act defines wetlands as:

> *Wetland means lands within the Coastal Zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.*
>
> Public Resources Code Section 30121)

The Half Moon Bay LUP defines wetlands as:

> *Wetlands shall be defined according to the single-parameter definition in Section 30121 of the Coastal Act and Section 13577(b) of the Coastal Commission's Regulations. Wetlands shall include land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes. Wetlands may also include land where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats.*

CCC Administrative Regulations (Section 13577 (b)) provides a more explicit definition:

> *Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deepwater habitats.*

The CCC has considered this definition as requiring the observation of one diagnostic feature of a wetland such as wetland hydrology, dominance by wetland vegetation (hydrophytes), or presence of hydric soils as a basis for asserting jurisdiction under the Coastal Act.

In addition to the above definition, the *Statewide Interpretive Guidelines for Identifying and Mapping Wetlands and Other Wet Environmentally Sensitive Habitat Areas* (CCC ZP Hymanson 1981) provide technical criteria for use in identifying and delineating wetlands and other ESHAs within the Coastal Zone.

The technical criteria presented in the guidelines are based on the Coastal Act definition and indicate that wetland hydrology is the most important parameter for determining a wetland, recognizing that:

> *… the single feature that most wetlands share is soil or substrata that is at least periodically saturated with or covered by water, and this is the feature used to describe wetlands in the Coastal Act. The water creates severe physiological problems for all plants and animals except those that are adapted for life in water or in saturated soil, and therefore only plants adapted to these wet conditions (hydrophytes) could thrive in these wet (hydric) soils. Thus, the presence or absence of hydrophytes and hydric soils make excellent physical parameters upon which to judge the existence of wetland habitat areas for the purposes of the Coastal Act, but they are not the sole criteria.*

The Technical Criteria requires that saturation of soil in a wetland must be at or near the surface continuously for a period of time. The meaning of "at or near the surface" generally is considered to be approximately one-foot from the surface or less (the root zone), and the saturation must be continuously present for a period of time (generally more than two weeks) in order to create the necessary soil reduction (anaerobic) processes that create wetland conditions. For example, water from rain during a storm that causes saturation near the surface but then evaporates or infiltrates to 18 inches or deeper below the surface shortly after the storm does not meet the generally accepted criteria for wetland hydrology.

The presence of wetland classified plants or the presence of hydric soils (generally referred to as the "one parameter approach") can be used to identify an area as being a wetland in the Coastal Zone. There is correlation between the presence of wetland plants, wetland hydrology, and/or hydric soils occurring together, especially in natural undisturbed areas, and in many cases where one of these parameters is found (e.g., wetland plants) the other parameters will also occur. But there are situations which can result in the presence of wetland classified plants without there being wetland conditions, and these areas are not wetlands. Where these situations occur, the delineation study must carefully scrutinize whether the wetland classified plants that are present are growing there as hydrophytes in reducing (anaerobic) conditions caused by the presence of wetland hydrology or are there for some other (non-wetland) reason. Examples may include wetland-classified plants which are also salt-tolerant (e.g., alkali heath) and may be responding to either wetland conditions or saline soil conditions, but not necessarily both, and deep-rooted trees (e.g., willows) which are able to tap into deep groundwater sources and can grow in dry surface soils, but are also found in wetland conditions where surface water is present.

Hydric soils can also occur in upland areas especially in areas where historic disturbances may have exposed substratum or in densely vegetated grasslands (mollisols). Similarly, the delineation must determine if the hydric soil indicators are a result of frequent anaerobic conditions or if they are the result of non-wetland conditions.

The Coastal Act uses a broad wetland definition in which the presence of any one of the wetland parameters may indicate presence of a wetland. The CCC presumes that the area is a wetland if one of the wetland parameters is present. However, there may be exceptions to this presumption if there is strong positive evidence of upland conditions, as opposed to negative evidence of wetland conditions. Positive evidence of upland hydrology might be the observation that a given area saturates only ephemerally following significant rainfall, that the soil is very permeable with no confining layer, or that the land is steep and drains rapidly. Positive evidence of upland conditions should be obtained during the wet season. Based on these facts, this biological resource evaluation identified areas within the Study

Area that had wetland plants, hydric soils, or wetland hydrology indicators. Soils, hydrology, and vegetation were examined on January 14, 2021 at locations within the Study Area that had the potential to meet the LCP's wetland definition.

All areas meeting at least one parameter are depicted on the jurisdictional delineation map as red alder forest.

Streams

A stream is a natural watercourse as designated by a solid line or dash and three dots symbol shown on the USGS map most recently published, or any well-defined channel with distinguishable bed and bank that shows evidence of having contained flowing water as indicated by scour or deposit of rock, sand, gravel, soil, or debris (CCC ZP Hymanson 1981). Prior to visiting the site, WRA reviewed the most recent USGS map for the Study Area.

Riparian Corridors

The Half Moon Bay LCP definition of "riparian corridors" is:

> *Riparian corridors are defined on the ground by an association of native, and in some cases non-native, plant and animal species within or adjacent to a watercourse that contribute to the function or distinction of the riparian habitat. Boundaries of riparian corridors are determined by the limit of riparian vegetation or top of bank, or other confining topography, whichever is greater. The limit of riparian vegetation is determined by the drip line of riparian canopy trees or the limit of riparian shrubs or herbaceous vegetation.*

The LCP establishes a mandatory riparian buffer zone extending 50 feet outward from the limit of riparian vegetation on perennial streams. During the January 14, 2021 site visit, WRA made a rapid assessment of the dominant vegetation along the drainage course located within and adjacent to the Study Area. The dripline of vegetation along Pilarcitos Creek within the Study Area boundary was mapped using a hand-held GPS unit and aerial photography.

3.3 Special-status Species

Potential occurrence of special-status species in the Project Area was evaluated by first determining which special-status species occur in the vicinity of the Project Area through a literature and database review as described above. Presence of suitable habitat for special-status species was evaluated during the site visit based on physical and biological conditions of the site, as well as the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then determined according to the following criteria:

- No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

- Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

- Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

- High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

- Present. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site in the recent past.

If a more thorough assessment was deemed necessary, a targeted or protocol-level assessment or survey was conducted or recommended as a future study. If a special-status species was observed during the site visit, its presence was recorded and discussed below in Section 5.3. If designated critical habitat is present for a species, the extent of critical habitat present and an evaluation of critical habitat elements is provided as part of the species discussions below.

4.0 ECOLOGICAL SETTING

The approximately 0.61-acre Project Area consists of the proposed limit-of-work for the Project. The approximately 10.91-acre Study Area includes the Project Area, a 200-foot buffer around the Project Area, and a Staging Area. The Study Area is located in the City of Half Moon Bay in San Mateo County and crosses Pilarcitos Creek, a USGS blue-line stream. The Study Area includes a portion of the Strawflower Village shopping center parking lot (APN 056-300-150) to the north and Oak and Pilarcitos Avenues to the south, as well as portions of the following APNs, adjacent to Pilarcitos Creek: 056-300-210, 056-040-999, 056-141-970 (Oak Avenue Park), and 056-141-950. The Project Area is owned by the City, and all other staging and equipment laydown areas are either within utility easements or City-owned road right-of-way. Additional detailed of the local setting are below.

4.1 Soils and Topography

The existing ground surface elevations range between 42 feet on the north side and about 44 feet on the south side of the proposed crossing. The creek bed near the proposed centerline of the crossing ranges between 27 and 29 feet above sea level. According to the *Soil Survey San Mateo Area* (USDA 1961) and California Soil Resource Lab's (CSRL) online soil viewer (CSRL 2021), the Study Area is underlain by eight soil mapping units: Denison clay loam (nearly level), Denison loam (sloping), Farallone coarse sandy loam (gently sloping), Farallone coarse sandy loam (moderately steep, eroded), Farallone Coarse sandy loam (nearly level), Farallone Coarse sandy loam (sloping, eroded), Farallone loam (nearly level), and Gullied land (alluvial soil material). These soil series are described below and depicted in Figure 3, Appendix A.

DENISON Series: The Denison series consists of very deep, moderately well drained soils developed from moderately fine textured granitic alluvium. Denison soils are have a limited distribution and occur on low terraces adjacent to the coast in central California. These soils have slow to medium runoff, slow permeability, and slopes ranging from 0 to 15 percent.

FARALLONE Series: The Farallone series consists of very deep, well drained soils, nearly level to moderately steep soils and recent fans and flood plains. The soils have formed in alluvium that was

derived mainly from granitic rocks. The vegetation in uncultivated areas is mainly coyote brush, bush lupine, and there are willows and other hydrophytic vegetation along drainageways.

GULLIED LAND: This miscellaneous land type occurs near streams that extend through areas of Botella, Farallone, and Soquel soil series. Relief along streams range from gently sloping to sloping. These areas are prone to streambank cutting and are usually heavily vegetated by woody plants.

4.2 Climate and Hydrology

The Study Area is located in the coastal region of San Mateo County. The average monthly maximum temperature in the area is 67 degrees Fahrenheit, while the average monthly minimum temperature is 45 degrees Fahrenheit. Predominantly, precipitation falls as rainfall between November and March with an annual average precipitation of 27 inches.

The local watershed is Arroyo Leon (HUC 12: 180500060201) and the regional watershed is the San Francisco Coastal South (HUC 8: 18050006). The Study Area is located in the lower portion of the Arroyo Leon watershed. Pilarcitos Creek (also called Arroyo Leon) is a USGS blue-line perennial stream in the Study Area (USGS 2018). Detailed descriptions of aquatic resources are provided in Section 5.1 below.

4.3 Land-use

The north side of the Study Area consists of a paved parking lot behind Safeway in the Strawflower Village shopping center. The area along the proposed pipeline alignment is a heavily vegetated riparian corridor with trees, shrubs, understory vines, and Pilarcitos Creek. Active homeless encampments are present within the corridor. The south staging area is within Oak Park along the north side of Oak Avenue. The area consists of mowed lawn, paved and gravel walking paths, paved asphalt along Oak Avenue, and landscaped areas. Detailed plant community descriptions are included in Section 5.1 below. Surrounding land uses include residential development to south, a shopping center to the north, Pilarcitos Creek riparian corridor and Route 1 to the east, and Pilarcitos Creek riparian corridor and agriculture to the west (Google 2021).

5.0 ASSESSMENT RESULTS

5.1 Vegetation Communities and Other Land Cover

WRA observed three land cover types within the Study Area: developed area, red alder forest, and perennial stream. Land cover types within the Study Area are illustrated on Figure 4, Appendix A. The non-sensitive land cover types in the Study Area include developed, while the sensitive communities include red alder forest and perennial stream. The Project Area and HDD construction methodology have been intentionally chosen to avoid impacts to Pilarcitos Creek and associated riparian corridor. Table 1 below lists all vegetation communities and land cover types observed within the Study Area. A list of species observed during the site visit is included in Appendix B. Photographs of the Study Area are included in Appendix C.

TABLE 1. VEGETATION COMMUNITY AND LAND COVER TYPES

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING	ACRES WITHIN STUDY AREA
Terrestrial Community/Land Cover			

TABLE 1. VEGETATION COMMUNITY AND LAND COVER TYPES

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING	ACRES WITHIN STUDY AREA
Developed Area	N	None	5.59
Red Alder Forest	Y	G5/S4	3.50
Aquatic Resources			
Perennial Stream	Y	None	1.82

5.1.1 Terrestrial Land Cover

Developed Area (no vegetation alliance). CDFW Rank: Not Sensitive. Developed area consists of paved surfaces, buildings, mowed lawn, and ornamental landscaping. Vegetation in developed areas includes planted trees and horticultural varietals. Woody vegetation is sparse and consists of Monterey cypress (*Hesperocyparis macrocarpa,* NL), toyon (*Heteromeles arbutifolia*, NL), strawberry tree (*Arbutus unedo*, NL), Ngaio tree (*Myoporum laetum*, FACU), and other landscape varietals. Herbaceous species in mowed areas appeared to be dominated by non-native annual species at the time of the site visit; however, due to the January assessment timing and mowing schedule, not all species were readily identifiable. Observed common species included Italian ryegrass (*Festuca perennis*, FAC), slim oat (*Avena barbata*, NL), foxtail barley (*Hordeum murinum*, FACU), and forb seedlings including bristly ox-tongue (*Helminthotheca echioides*, FAC), poison hemlock (*Conium maculatum*, FAC), and wild geranium (*Geranium dissectum*, NL). This community is not considered sensitive under CEQA or the LCP.

Red Alder Forest (*Alnus rubra* Forest Alliance). CDFW Rank: Sensitive. Red alder forest is known from the central California coast, northern California coast, and Klamath mountain regions along the coastline. This vegetation community occurs both as riparian and upland stands located along stream and river backwaters, banks, flood plains, mouths, terraces, and slopes of all aspects (CNPS 2021b).

Red alder forest is mapped in the Study Area according to CNPS (2021b) as having red alder (*Alnus rubra*, FAC) greater than 50 percent relative cover in the tree canopy. Red alder forest in the Study Area is situated along the banks and floodplain of a perennial stream, but were in upland positions (i.e. hydric soil and wetland hydrology indicators absent). The overstory is dominated by red alder with occasional co- to sub-dominant stands of red willow (*Salix laevigata*, FACW). The sub-canopy ranges from dense thickets of red willow and arroyo willow (*Salix lasiolepis*, FACW) with scattered individuals of blackwood acacia (*Acacia melanoxylon*, NL), Ngaio tree, and cottonwood (*Populus fremontii* ssp. *fremontii*, FAC) to open understory dominated by herbaceous vegetation. Understory cover is dense to open and dominated by vines including Cape ivy (*Delairea odorata*, FAC), garden nasturtium (*Tropaeolum majus*, UPL), stinging nettle (*Urtica dioica*, FAC), California blackberry (*Rubus ursinus*, FAC), and English ivy (*Hedera helix*, FACU).

Red alder forest has a sensitivity ranking of G5S4 indicating that it is secure both globally and locally in California; however, because this habitat occurs as a riparian community, it is regulated by the CDFW and RWQCB and is therefore considered sensitive under CEQA. As more than 50 percent of riparian overstory consisted of riparian species; the riparian community is regulated under the Coast Act / City LCP and are therefore considered an ESHA. Accordingly, a 50-foot LCP buffer around this riparian community is displayed on Figure 5, Appendix A.

5.1.2 Aquatic Resources

Perennial Stream. (No vegetation alliance). CDFW Rank: Sensitive. Pilarcitos Creek is a perennial stream that occupies approximates 1,328 linear feet (1.82 acre) of the Study Area. The creek is confined within a well-defined meandering channel within a heavily vegetated riparian corridor. Within the Study Area, the creek flows east to west and enters the Pacific Ocean outside the Study Area approximately 1-mile west. The creek was flowing at the time of the site visit and had a substrate consisting of sand and fine bed material. Perennial stream was mapped where indicators of OHWM were observed, such as evidence of flow, bed and bank, scour, sediment sorting, wrack, and absence of vegetation. Where vegetation occurs below OHWM, it is generally sparse and consists of watercress (*Nasturtium officinale*, OBL) and garden nasturtium. Vegetation between OHWM and TOB is typically sparse, consisting of vine species including Cape ivy and garden nasturtium. All perennial stream mapped in the Study Area are regulated by the Corps, RWQCB, CCC/LCP, and CDFW.

5.2 Summary of Potentially Jurisdictional Features

A delineation of the Study Area was conducted concurrently with the site visit on January 14, 2021. Areas mapped as potential jurisdictional features include non-wetland waters (perennial stream) and red alder forest. Areas subject to Corps, RWQCB, CDFW, and CCC/LCP jurisdiction are summarized in Table 2 and shown in Figure 5, Appendix A. No delineation data sheets are included as no potentially jurisdictional wetlands were observed within the Study Area. Potentially jurisdictional natural communities are discussed in greater detail above in Section 3.

TABLE 2. JURISDICTIONAL FEATURES WITHIN THE STUDY AREA

JURISDICTION	FEATURE	PROJECT AREA (ACRE/LINEAR FEET)	STUDY AREA ACRE/LINEAR FEET)
Corps Section 404	Perennial Stream (based on OHWM	0.02 / 28	0.90 / 1,328
	CORPS TOTAL	**0.02 / 28**	**0.90 / 1,328**
RWQCB Section 401	Perennial Stream (based on TOB)	0.04 / 28	1.82 /1,328
	Riparian Corridor	0.12 / NA	3.39 / NA
	RWQCB TOTAL	**0.16 / 28**	**5.21 / 1,328**
CDFW Section 1602	Perennial Stream (based on TOB)	0.04 / 28	1.82 /1,328
	Riparian Corridor	0.12 / NA	3.39 / NA
	CDFW TOTAL	**0.16 / 28**	**5.21 / 1,328**
CCC / LCP	Perennial Stream (based on TOB)	0.04 / 28	1.82 /1,328
	Riparian Corridor and LCP Buffer	0.43 / NA	3.39 / NA
	CCC / LCP TOTAL	**0.47 / 28**	**5.21 / 1,328**

5.3 Special-status Species

5.3.1 Special-status Plants

Based upon a review of the resource databases listed in Section 3, 60 special-status plant species have been documented in the vicinity of the Study Area. Appendix D summarizes the potential for occurrence of each of these special-status plant species to occur in the Study Area. All plant species observed in the Study Area during the site visit are included in Appendix B. No special-status plant species were determined to have a moderate or high potential to occur within the Study Area. All special-status plants are unlikely or have no potential to occur within the Study Area for one or more of the following reasons:

- Edaphic (soil) conditions (e.g., sand, sandstone, serpentine) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., grassland, coastal scrub, chaparral, coastal bluff/dune, marsh, redwood forest) necessary to support the special-status plant species are not present in the Study Area; or
- Land use history and contemporary management (e.g., human activity) has degraded the localized habitat necessary to support the special-status plant species.

5.3.2 Special-status Wildlife

Based upon a review of the resources and databases given in Section 3, seven special-status wildlife species have been documented, or have potential to occur in the vicinity of the Study Area. Appendix D summarizes the potential for each of these species to occur in the Study Area.

The special-status wildlife species discussed below have a moderate or high potential to occur in the Study Area. The remaining species documented to occur in the vicinity of the Study Area have no potential or are unlikely to occur due to a lack of suitable habitat components (such as tidal salt marsh, marine environments, sand or dunes, caves, mines, or abandoned buildings) or the Study Area is outside of the known distribution of the species.

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), CDFW Species of Special Concern. This subspecies of the dusky-footed woodrat occurs in the Coast Ranges between San Francisco Bay and the Salinas River (Matocq 2002). Occupied habitats are variable and include forest, woodland, riparian areas, and chaparral. Woodrats feed on woody plants, but will also consume fungi, grasses, flowers and acorns. Foraging occurs on the ground and in bushes and trees. This species constructs robust stick houses/structures in areas with moderate cover and a well-developed understory containing woody debris. Breeding takes place from December to September. Individuals are active year-round, and generally nocturnal.

This species has been documented 3.5 miles to the northeast in vegetated areas along state highway 35 (CDFW 2021). While not documented in urban Half Moon Bay, this species is generally present in the region and is known to create nests in densely vegetated areas including riparian areas. While no stick nest structures were observed within the Study area during the January 2021 site visit, conditions are potentially favorable for occupation by this species were they to disperse to the Study Area from generally

more suitable habitats. Although impacts to the riparian area are not anticipated in the course of this Project, woodrat may establish nests adjacent to work areas and thus have moderate potential to occur.

San Francisco (salt marsh) common yellowthroat (*Geothlypis trichas sinuosa*), CDFW Species of Special Concern. This subspecies of the common yellowthroat is found in freshwater marshes, coastal swales, riparian thickets, brackish marshes, and saltwater marshes. Their breeding range extends from Tomales Bay in the north, Carquinez Strait to the east, and Santa Cruz County to the south. This species requires thick, continuous cover such as tall grasses, tule patches, or riparian vegetation down to the water surface for foraging and prefers willows for nesting. Dense patches of willow within the Study Area may provide suitable nesting habitat for this species. Additionally, this species has been documented to occur less than 1 mile from the Study Area (California Department of Fish and Wildlife (CDFW) 2021). Therefore, there is a high potential for this species to nest and forage within the Study Area.

White-tailed kite (*Elanus leucurus*). CDFW Fully Protected Species. The white-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities (Dunk 1995). Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall (Dunk 1995). This species preys upon a variety of small mammals, as well as other vertebrates and invertebrates.

This species is commonly present along the California coast, and can be observed foraging in grassland areas in the vicinity of the Study Area (Shuford and Gardali 2008). Small trees are present adjacent to open spaces nearby that could provide nesting habitat for this species. Foraging opportunities are common in shoreline grasslands and marshes. Thus, this species has a moderate potential to occur.

Western pond turtle (WPT, *Actinemys marmorata*), CDFW Species of Special Concern. The western pond turtle (WPT) is the only native freshwater turtle in California. This turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. WPT inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation. WPT also occupies man-made habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks, and sand. Warm, shallow, nutrient-rich waters are ideal as they support WPT prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, WPT often occupy creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high water flow, high salinity, or prolonged dry conditions, WPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months (Rathbun et al. 2002). Although upland habitat is utilized for refuging and nesting, this species preferentially utilizes aquatic and riparian corridors for movement and dispersal.

There have been no documented occurrences of this species within 5 miles of the Study Area (CDFW 2021). At the time of the January 14, 2021 site visit, the portion of Pilarcitos Creek within the Study Area was slow-moving, which is a positive attribute for turtles. It was shallow and clear, however, and did not provide aquatic escape habitat for turtles to evade predators. It is likely that during the rainy season, the creek would provide more aquatic escape habitat. The creek is also very entrenched through the Study Area, likely making it difficult for turtles to move to upland habitat for nesting or seasonal refuge. WPT is

unlikely to nest in or adjacent to the Study Area, though it may occasionally move through or bask within the Study Area when there are appropriate water levels and sufficient sunlight passes through the tree canopy. Therefore, there is a moderate potential for this species to occur within the Study Area.

San Francisco garter snake (SFGS, *Thamnophis sirtalis tetrataenia*), Federal Endangered, State Endangered, CDFW Fully Protected. Historically, San Francisco garter snake (SFGS) occurred in scattered wetland areas on the San Francisco Peninsula from approximately the San Francisco County line south along the eastern and western bases of the Santa Cruz Mountains, at least to the Upper Crystal Springs Reservoir, and along the coast south to Año Nuevo Point, San Mateo County, and Waddell Creek, Santa Cruz County. The preferred habitat of the SFGS is a densely vegetated pond near an open hillside where they can sun themselves, feed, and find cover in rodent burrows; however, considerably less-ideal habitats can be successfully occupied. Temporary ponds and other seasonal freshwater bodies are also used. Emergent and bankside vegetation such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.) and spike rushes (*Juncus* spp. and *Eleocharis* spp.) apparently are preferred and used for cover. The area between stream and pond habitats and grasslands or bank sides is used for basking, while nearby dense vegetation or water often provide escape cover. Snakes also use floating algal or rush mats, if available.

There are two significant components to SFGS habitat: 1) ponds or suitable habitat that support California red-legged frog (CRLF), American bullfrog (*Rana catesbeiana*), or the Pacific chorusfrog (*Pseudacris regilla*) and 2) surrounding upland that supports Botta's pocket gopher *(Thomomys bottae)* or the California meadow vole *(Microtus californicus).* Ranid frogs are an obligate component of the SFGS's diet (USFWS 2006).

SFGS has been documented to occur within Pilarcitos Creek (CDFW 2021). There is not a substantial amount of emergent vegetation within the Study Area, but the snake may still move through and occasionally forage within aquatic habitat and uplands on-site. Based on habitat conditions and the close proximity of documented occurrences, there is a high potential for this species to occur, at least as a transient, within the Study Area.

California red-legged frog (*Rana draytonii;* CRLF), Federal Threatened Species, CDFW Species of Special Concern. California red-legged frog (CRLF) is dependent on suitable aquatic, estivation, and upland habitat. During periods of wet weather, starting with the first rainfall in late fall, red-legged frogs disperse away from their estivation sites to seek suitable breeding habitat. Aquatic and breeding habitat is characterized by dense, shrubby, riparian vegetation and deep, still or slow-moving water. Breeding occurs between late November and late April. CRLF estivate (period of inactivity) during the dry months in small mammal burrows, moist leaf litter, incised stream channels, and large cracks in the bottom of dried ponds.

There are four physical and biological features that are considered to be essential for the conservation or survival of a species. The features for the CRLF include: aquatic breeding habitat; non-breeding aquatic habitat; upland habitat; and dispersal habitat (USFWS 2010).

Aquatic breeding habitat consists of low-gradient fresh water bodies, including natural and manmade (e.g. stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. It does not include deep water habitat, such as lakes and reservoirs. Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years. This is the average amount of time needed for egg, larvae, and tadpole development and metamorphosis so that juveniles can become capable of surviving in upland habitats (USFWS 2010).

Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult CRLF. These waterbodies include plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. The CRLF can use large cracks in the bottom of dried ponds as refugia to maintain moisture and avoid heat and solar exposure (Alvarez 2004). Non-breeding aquatic features enable CRLF to survive drought periods, and disperse to other aquatic breeding habitat (USFWS 2010).

Upland habitats include areas within 300 feet of aquatic and riparian habitat and are comprised of grasslands, woodlands, and/or vegetation that provide shelter, forage, and predator avoidance. These upland features provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat can include structural features such as boulders, rocks and organic debris (e.g. downed trees, logs), as well as small mammal burrows and moist leaf litter (USFWS 2010).

Dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites. Dispersal habitat includes various natural and altered habitats such as agricultural fields, which do not contain barriers to dispersal. Moderate- to high-density urban or industrial developments, large reservoirs, and heavily traveled roads without bridges or culverts are considered barriers to dispersal (USFWS 2010). Although CRLF is highly aquatic, this species has been documented to make overland movements of several hundred meters and up to one mile during a winter-spring wet season in Northern California (Bulger et al. 2003; Fellers and Kleeman 2007) and 2,860 meters (1.8 miles) in the central California coast (Rathbun and Schneider 2001). Frogs traveling along water courses can exceeded these distances.

The portion of Pilarcitos Creek within the Study Area may provide suitable aquatic breeding and dispersal habitat for this species. The riparian canopy cover and low gradient, slow-moving intermittent creek are positive habitat attributes. This species is unlikely to use uplands within the Study Area, however, due to the highly entrenched banks around the creek, which are likely difficult for this frog to climb in most locations, and due to the highly developed area surrounding the Study Area. This species was documented directly adjacent to the Study Area in 2006 (CDFW 2021). Based on habitat conditions and the close proximity of documented occurrences, there is a high potential for this species to occur within the Study Area.

Steelhead - Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened. The Central California Coast DPS includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending two years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4-or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.

This species has been observed within Pilarcitos Creek, and both adults and smolting juveniles likely pass through the Study Area on their way to or from breeding grounds. This species is likely to be present only seasonally when water levels allow fish passage, during migrations to spawning grounds further upstream, and during outmigration. Based on habitat characteristics and documented occurrences within Pilarcitos Creek, this species has a high potential to occur within the Study Area.

5.4 Wildlife Corridors and Native Wildlife Nursery Sites

The Study Area falls within an essential connectivity area identified by the California Essential Habitat Connectivity Project, and is classified in the "least permeable" category (CalTrans 2010; CDFW 2021). The stream and associated riparian corridor, which runs through the Study Area may serve as a small-scale habitat corridor. The riparian corridor may allow wildlife to move between habitats, or into small patches of nearby undeveloped uplands. While this corridor is narrow and actively traversed by homeless people, it still serves to link these smaller, potentially core habitats, fulfilling the criteria as a wildlife corridor.

6.0 POTENTIAL IMPACTS AND MITIGATION EVALUATION

The CCWD proposes to construct a new water pipeline under Pilarcitos Creek as part of upgrades to their water supply infrastructure. Preliminary cross-section and plan view drawings are provided in Appendix E. The entire 450-foot-long pipeline would be installed using HDD and avoid all impacts to sensitive natural communities. The limits of work are shown in relation to sensitive natural communities and LCP buffer areas in the Study Area in Appendix A, Figures 4 and 5. The following sections provide an evaluation of potential impacts to sensitive habitats and species and recommended avoidance, minimization, and mitigation measures.

6.1 Sensitive Natural Communities and Land Cover Types

Pilarcitos Creek and its riparian corridor is within the Study Area; however, outside the limit of disturbance due to the proposed HDD construction method. Thus, no direct impacts are anticipated to occur to potential ESHAs or areas subject to the regulatory jurisdiction of the Corps, RWQCB, or CDFW. The Project will pass through the 50-foot LCP buffer zone for riparian habitat surrounding perennial streams; however, the City LCP permits necessary water supply projects in these zones (Appendix A, Figure 5). The Project will require a coastal development permit because it involves the placement or removal of solid material or the use of mechanized equipment within the 50-foot buffer zone.

Although no direct impacts to potential ESHAs or other jurisdictional areas are anticipated, HDD does have the potential for "frac-out", where pressure built up in the bore tunnel can force drilling mud up through the ground and into the natural environment. The Project has been specifically designed to minimize the risk of frac-outs, as described in Section 4.1.5 and Appendix E of the Preliminary Design Report (Appendix F). Although it is unlikely, if frac-out occurs, it may affect sensitive ESHA communities.

To avoid impacts to sensitive ESHA communities, the following best management practices are recommended in addition to the Mitigation Measures in Section 6.5.

- Implement best management practices to prevent erosion of soils, runoff, and sedimentation, and to prevent discharge of toxic substances;

- Minimize soil disturbance in the riparian corridor and the 50-foot buffer zone around the riparian corridor. This will reduce the impact to existing soils and vegetation that will remain as natural habitat and reduce the potential for soil erosion; and

- Solid materials, including wood, masonry/rock, glass, paper, or other materials should not be stored in the 50-foot riparian buffer zone outside exclusion fencing. Solid waste materials should be properly disposed of off-site. Fluid materials, including concrete, wash water, fuels, lubricants, or other fluid materials used during construction should not be disposed of on-site and should be stored or confined as necessary to prevent spillage into natural habitats. If a spill of such materials occurs, the area should be cleaned and contaminated materials disposed of properly. The affected area should be restored to its natural condition.

6.2 Special-Status Plant Species

Of the 60 special-status plant species known to occur in the vicinity of the Study Area, none were determined to have a moderate or high potential to occur in the Study Area. No additional special-status plant surveys are recommended.

6.3 Special-Status Wildlife Species

Of the 41 special-status wildlife species known to occur within the vicinity of the Study Area, seven species were determined to have a moderate or high potential to occur within the Study Area. Recommended mitigation measures to avoid take of these species are included in Section 6.5.

6.3.1 Special-status and Non-special-status Nesting Birds

This assessment determined that two special-status bird species may nest within the Study Area (San Francisco common yellowthroat and white-tailed kite). In addition, common native bird species protected by the MBTA as well as CFGC sections 3503 and 3503.5 may nest within the Study Area. Mitigation Measure BIO-2 (see Section 6.5) is recommended to avoid impacts to special-status bird species and birds protected under the MBTA or CFGC.

6.3.2 California Red-legged Frog, San Francisco Garter Snake, Western Pond Turtle, and Steelhead

It is not anticipated that HDD activities will affect CRLF, SFGS, WPT, or steelhead. However, as discussed previously, HDD does have the potential for frac-out. Although it is unlikely, if frac-out occurs, it may affect habitat and potentially individuals of these species. California red-legged frog, WPT and SFGS are likely to inhabit aquatic habitat and the banks of Pilarcitos Creek within the Study Area, and steelhead habitat includes aquatic features and the cover provided by riparian trees, in-channel root wads and debris, and emergent vegetation (to the extent that it occurs). These species may forage and disperse through the Study Area; CRLF may also breed in and adjacent to the Study Area. Recommended mitigation measures to avoid take of CRLF, WPT, SFGS and steelhead are included in Section 6.5.

6.3.3 San Francisco Dusky-footed Woodrat

San Francisco dusky-footed woodrat has potential to occur in densely vegetated riparian areas of the Study Area. While no disturbance to these areas is anticipated as a result of HDD, any traversal of the

riparian area could result in impacts to and woodrat nests that may be present. Recommended mitigation measures to avoid impacts to San Francisco dusky-footed woodrat are included in Section 6.5.

6.4 Wildlife Corridors

While the Study Area is classified as a "less permeable" wildlife corridor, planned Project activities will not impact the riparian area or any other nearby natural habitat. Impacts will be highly localized to paved or landscaped areas. Waterways that could provide fish passage will additionally not be impacted or obstructed, as the planned HDD will occur underneath the stream bed. Because no work is planned in the stream or riparian habitat, no impacts to wildlife corridors are anticipated.

6.5 Mitigation Measures

MM BIO-1: Vegetation Removal. All vegetation removal, ground disturbance, and other construction activities shall occur at minimum 15 feet above the top of the creek bank to avoid low-lying mesic areas on the fringe of the creek.

MM BIO-2: Nesting Birds. All proposed Project activities shall occur between September 1 and February 14 in order to avoid potential impacts during the nesting season. If Project activities are conducted during the nesting season (February 15 – August 31), a pre-construction nesting bird survey shall be performed no more than 14 days prior to initial ground disturbance to avoid impacting active nests. If the survey identifies any active nests, an exclusion buffer shall be established for protection of the nest. Buffer distances shall vary based on species and conditions at the site, but typically range from 25 feet to 500 feet. The buffer shall be maintained until all young have fledged or until the nest fails, or otherwise becomes inactive. Buffers may be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

MM BIO-3: Frac-out Plan. The Project has been designed and shall be implemented in such a way to avoid and minimize the risk of spills and frac-outs, as evaluated in the Preliminary Design Report (Appendix F) for this Project. Although the risk of frac-outs was identified as low, the HDD contractor shall prepare a Frac-out and Surface Spill Prevention Plan, based on information contained in the HDD Specifications section 02413, prepared by EKI and dated April 2021. The Frac-out Plan shall be submitted to the City for approval prior to the issuance of the grading permit, and the contractor shall submit a letter signed by an authorized representative confirming that the plan will be followed during all HDD activity. The plan shall address the potential risks and modes of frac-outs and frac-out prevention and detection. The plan shall include a project description, including site description, existing conditions, relevant permit requirements, and HDD design and operations, and shall at a minimum include the following information.

- Calculations of maximum allowable and minimum required drilling fluid pressures, and the critical downhole pressure that would cause hydrofracture.
- Measures describing training of personnel regarding frac-out monitoring procedures, equipment, materials, and procedures in place for the prevention, containment, cleanup, and disposal of drilling fluids.
- Pre-construction measures such as lining the entry pit with an impervious flexible membrane, creating an earth berm, or erecting silt fence around the drilling fluid mixing and pumping areas, and erecting silt fences between the drilling staffing areas and sensitive areas.

- Identifying the personnel on site during the entire HDD installation process with responsibility for detecting whether surface returns have occurred and how they will conduct the monitoring.
- Monitoring of drilling pressures to ensure that they are maintained at a minimum level necessary to maintain fluid circulation and do not exceed those pressures that may penetrate the ground.
- Monitoring of fluid returns at the exit and entry pit to determine if fluid circulation has been lost.
- The Contractor shall measure and record the drilling fluid viscosity and density at least two times per shift or once every 150 feet of advancement, whichever is more frequent, with at least two hours between readings, using a calibrated Marsh funnel or rheometer/rotating viscometer, and a mud balance. These records shall be maintained and provided daily to the Engineer.

Protocols to be followed if there is a loss of circulation or other indication of frac-out are described below.

- Immediately respond to detection of a frac-out by stopping drilling operations and pulling back the drill head to relieve pressure.
- Implement procedures to contain terrestrial returns (e.g., by an earth berm, installation of materials to contain the fluid, or other method).
- Implement procedures to contain returns into a waterway or sensitive area (e.g., installation of sandbags or a standpipe or barrel tall enough to exceed the water level and sealed at the base).
- Implement procedures for clean-up and disposal of frac-out materials.
- Include an on-site materials list to manage and control drilling fluid surface releases, such as heavy weight plastic gravel filled and sealed bags, splash boards, 5-gallon hard plastic pails, wide heavy-duty push brooms, flat blade and round-nose shovels, silt fence and t-posts or straw bales, chicken wire or connecting material to tie off the perimeter of a dewatering structure, absorbent pads to use with plastic sheeting for placement beneath motorized equipment, straw wattles, portable pumps, hoses, vacuum trailers or trucks, silt fence or screens.
- The performance standard for this mitigation measure is that if a frac-out event occurs cleanup, surveys, photographs, agency or consultant recommendations, and a mitigation plan shall be submitted to the city of Half Moon Bay and any permitting agencies within 30 days of the event. Measures taken might include habitat restoration efforts, or surveys of special status species to assess impacts of the frac-out event. The city and regulatory agencies shall inspect and approve any remedial actions taken by the Lead Agency to respond to the frac-out event.

MM BIO-4: Dusky-footed Woodrat. To avoid impacts to the San Francisco dusky-footed woodrat, a pre-construction survey shall be conducted to search for stick nests in suitable habitats adjacent to the work area. Nest structures shall be avoided by Project work or access routes by a minimum of 5 feet. If avoidance is not feasible, the nest structure shall be dismantled by a qualified biologist. Nest material would be moved to suitable adjacent areas that shall not be disturbed. If young are encountered during the dismantling process, the material would be placed back on the nest and remain undisturbed for a minimum of two weeks to give the young enough time to mature and leave on their own accord. After the young have left the nest, the nest dismantling process would begin again.

MM BIO-5: General Avoidance Measures in Riparian and Stream Areas. To avoid impacts to riparian and stream areas, the following measures shall be implemented.

- Plastic monofilament netting (erosion control matting or wrapping around wattles), or similar material in any form shall not be used on the Project in order to avoid entangling, strangling, or trapping CRLF, SFGS, or WPT.

- Prior to the start of groundbreaking activities, all construction personnel shall receive training on special-status species and their habitats by a qualified biologist. The importance of these species and their habitat shall be described to all employees as well as the minimization and avoidance measures that are to be implemented as part of the Project. A list of trained personnel shall be maintained by the contractor and be made available for review by the USFWS and the CDFW upon request.

- No trash shall be deposited on the site during construction activities. All trash shall be placed in trash receptacles with secure lids stored in vehicles and removed nightly from the Study Area.

- Any fueling and maintenance of equipment shall be conducted off-site and at least 50 feet from any designated ESHA.

- When working within 50 feet of sensitive areas (e.g. adjacent to riparian habitat), wildlife exclusion fencing shall be installed and maintained around the perimeter of work areas. Exclusion fencing shall enclose any staged materials, equipment staging areas, work areas or access routes. Fencing shall be placed in areas which would prevent SFGS and CRLF from entering equipment or materials overnight. Once work in that area has been completed, exclusion fencing shall be removed as soon as possible. Exclusion fencing shall additionally be of a size and material that will not cause entrapment of CRLF.

- Construction activities shall not start until 30 minutes after sunrise, and should cease 30 minutes before sunset.

- No holes or trenches shall be left open overnight. Holes or trenches shall have at minimum escape ramps installed, or be backfilled at the end of the day.

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APPENDIX A – FIGURES

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Sources: National Geographic, WRA | Prepared By: SGillespie, 1/31/2021

Figure 1. Study Area Regional Location Map

CCWD Water Line Replacement
Under Pilarcitos Creek
Half Moon Bay, California

0 0.25 0.5 Miles

N

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Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 2. Aerial Site Map

CCWD Water Line Replacement
Under Pilarcitos Creek
Half Moon Bay, California

0 100 200 Feet

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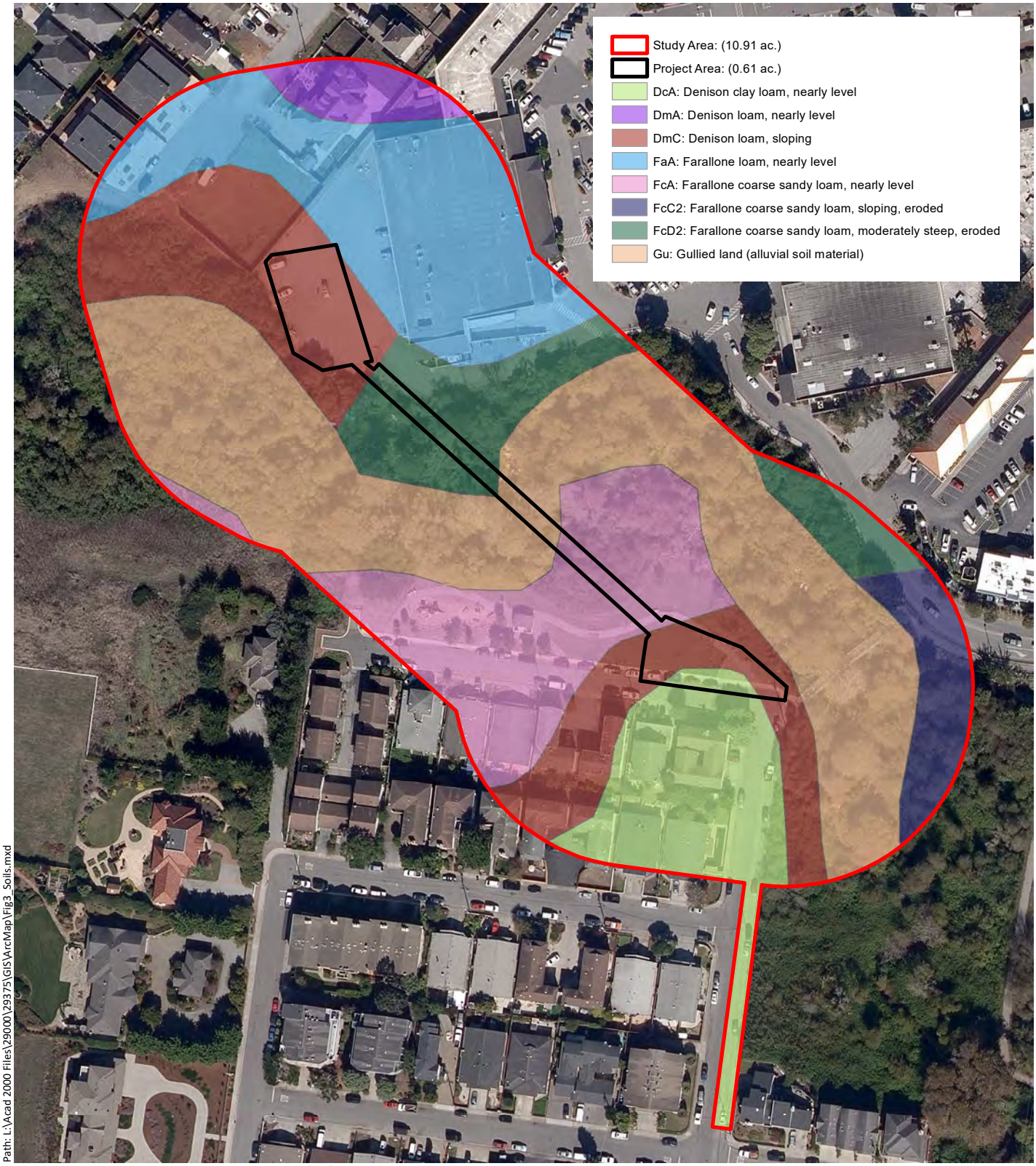

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Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 3. Soils within the Study Area

CCWD Water Line Replacement
Under Pilarcitos Creek
Half Moon Bay, California

0 100 200 Feet

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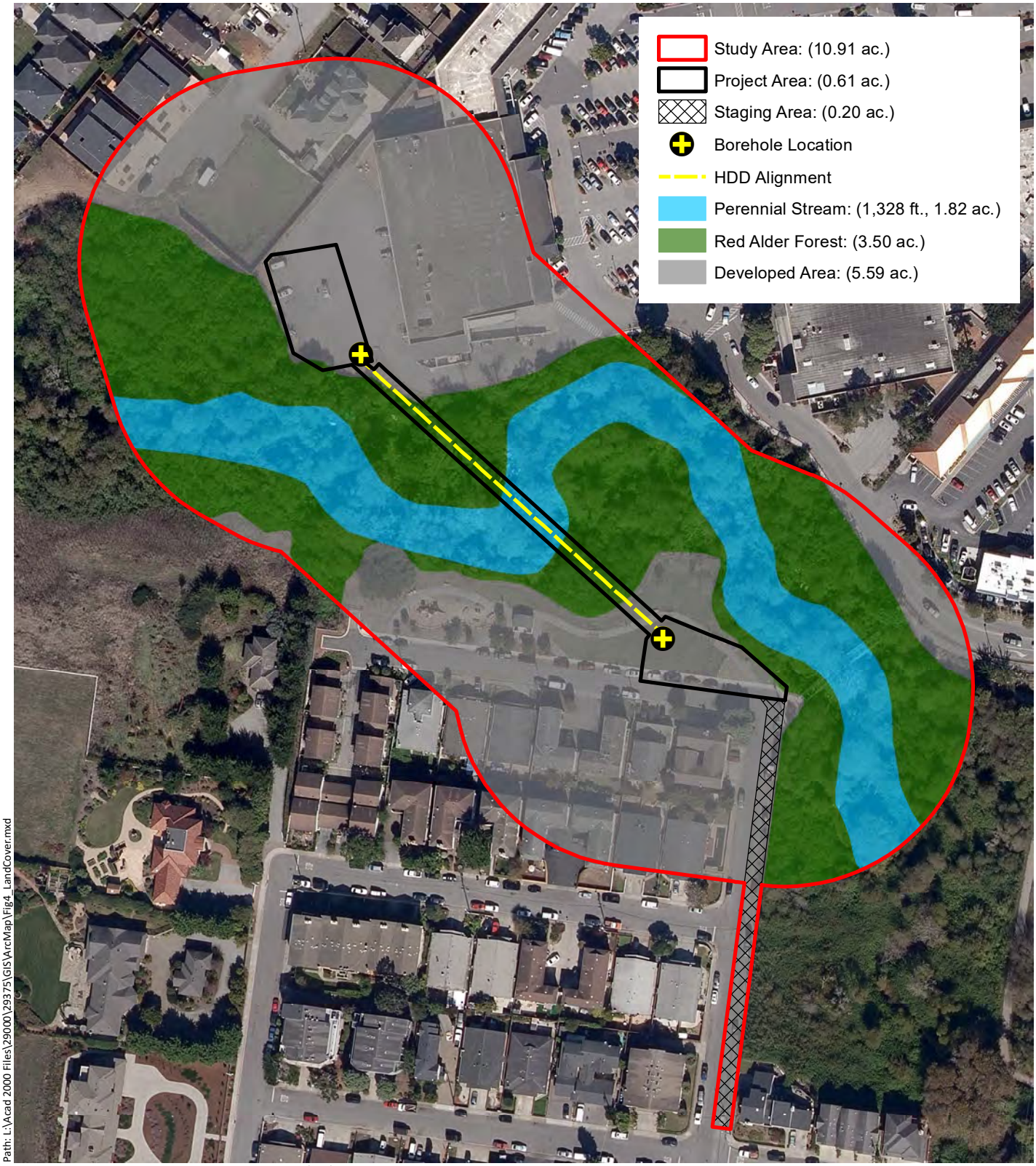

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Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 4. Land Cover Types within the Study Area

CCWD Water Line Replacement
Under Pilarcitos Creek
Half Moon Bay, California

0 100 200 Feet

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Sources: EKI, WRA | Prepared By: SGillespie, 1/31/2021

Figure 5. Potential Jurisdictional Features Located within the Study Area

CCWD Water Line Replacement
Under Pilarcitos Creek
Half Moon Bay, California

0 100 200 Feet

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APPENDIX B – SPECIES DOCUMENTED WITHIN AND AROUND THE STUDY AREA

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Appendix B.1. Plant species observed during January 14, 2021 site visit.

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status[3] (AW 2018)
Plants						
Acacia melanoxylon	Blackwood acacia	non-native (invasive)	tree	-	Limited	-
Alnus rubra	Red alder	native	tree, shrub	-	-	FACW
Arctotheca prostrata	Prostrate cape weed	non-native (invasive)	annual, perennial herb	-	Moderate	-
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Carduus pycnocephalus ssp. pycnocephalus	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-
Conium maculatum	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate	FACW
Convolvulus arvensis	Field bindweed	non-native	perennial herb, vine	-	-	-
Cortaderia jubata	Andean pampas grass	non-native (invasive)	perennial grass	-	High	FACU
Delairea odorata	Cape ivy	non-native (invasive)	perennial herb	-	High	FAC
Equisetum arvense	Common horsetail	native	fern	-	-	FAC
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC
Foeniculum vulgare	Fennel	non-native (invasive)	perennial herb	-	High	-
Geranium dissectum	Wild geranium	non-native (invasive)	annual herb	-	Limited	-
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC
Hesperocyparis	Monterey cypress	native	tree	Rank	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status[1]	CAL-IPC Status[2]	Wetland Status[3] (AW 2018)
macrocarpa				1B.2*		
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Hordeum murinum	Foxtail barley	non-native (invasive)	annual grass	-	Moderate	FACU
Morella californica	California wax myrtle	native	shrub	-	-	FACW
Myoporum laetum	Ngaio tree	non-native (invasive)	tree, shrub	-	Moderate	FACU
Nasturtium officinale	Watercress	native	perennial herb (aquatic)	-	-	OBL
Oxalis pes-caprae	Bermuda buttercup	non-native (invasive)	perennial herb	-	Moderate	-
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC
Populus fremontii ssp. fremontii	Cottonwood	native	tree	-	-	FAC
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
Rubus ursinus	California blackberry	native	vine, shrub	-	-	FAC
Salix laevigata	Red willow	native	tree	-	-	FACW
Salix lasiandra	Pacific willow	native	tree	-	-	FACW
Toxicodendron diversilobum	Poison oak	native	vine, shrub	-	-	FACU
Tropaeolum majus	Garden nasturtium	non-native	annual herb, vine	-	-	UPL
Urtica dioica	Stinging nettle	native	perennial herb	-	-	FAC
Vitis californica	California wild grape	native	vine, shrub	-	-	FACU

All species identified using the *Jepson eFlora* [Jepson Flora Project (eds.) 2021]; nomenclature follows *Jepson eFlora* [Jepson Flora Project (eds.) 2021]
*Special-status only within its native range. The Study Area is outside of the native range of this species.

[1]Rarity Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2021)

FE:	Federal Endangered
FT:	Federal Threatened
SE:	State Endangered
ST:	State Threatened
SR:	State Rare
Rank 1A:	Plants presumed extinct in California
Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere
Rank 2:	Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3:	Plants about which we need more information – a review list
Rank 4:	Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2021)

High:	Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate:	Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited-moderate distribution ecologically
Limited:	Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed:	Assessed by Cal-IPC and determined to not be an existing current threat

[3]Wetland Status: National List of Plant Species that Occur in Wetlands, California – Arid West (Lichvar et al. 2016)

OBL:	Almost always found in wetlands;
FACW:	Usually found in wetlands
FAC:	Equally found in wetlands and uplands
FACU:	Usually not found in wetlands
UPL:	Almost never found in wetlands
NL:	Not listed, assumed almost never found in wetlands
NI:	No information; not factored during wetland delineation

Appendix B.2. Wildlife species observed during January 14, 2021 site visit.

Scientific Name	Common Name	Conservation Status
Birds		
Haemorhous mexicanus	House Finch	None
Thryomanes bewickii	Bewicke's wren	None
Melozone crissalis	California towhee	None
Setophaga townsendi	Townsend's warbler	None
Setophaga coronata	Yellow-rumped warbler	None
Sturnus vulgaris	European starling	None
Corvus brachyrhynchos	American crow	None
Buteo lineatus	Red-shouldered hawk	None
Calypte anna	Anna's hummingbird	None
Regulus calendula	Ruby-crowned kinglet	None
Zonotrichia leucophrys	White-crowned sparrow	None
Poecile rufescens	Chestnut-backed chickadee	None

APPENDIX C – -SITE PHOTOGRAPHS

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Photo 1. Red alder forest within the Study Area. View from the north side of Pilarcitos Creek looking south.

Photo 2. Pilarcitos Creek within the Study Area. Creek banks are vegetated with garden nasturtium.

Photo 3. View of existing landscaped and paved area within the Study Area. Photograph shows the approximate location of the south staging area and borehole location for the Project.

Photo 4. View of the existing paved lot behind Safeway within the Study Area. Photograph shows the approximate location of the north staging area and borehole location for the Project..

APPENDIX D – SPECIAL-STATUS SPECIES POTENTIAL TABLE

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Appendix D. Potential for Special-Status Plant and Wildlife Species to Occur in the Study Area. List compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database (2021), U.S. Fish and Wildlife Service (USFWS) Species Lists (2021), and California Native Plant Society (CNPS) Electronic Inventory (2021) searches of the 6 Quad Search centered on the Half Moon Bay USGS 7.5-minute quadrangle.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Plants				
San Mateo thorn-mint *Acanthomintha duttonii*	FE, SE, Rank 1B.1	Chaparral, valley and foothill grassland. Elevation ranges from 160 to 985 feet (50 to 300 meters). Blooms Apr-Jun.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
Blasdale's bent grass *Agrostis blasdalei*	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms May-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or coastal dunes.	No further actions are recommended.
Franciscan onion *Allium peninsulare var. franciscanum*	Rank 1B.2	Cismontane woodland, valley and foothill grassland. Elevation ranges from 170 to 1000 feet (52 to 305 meters). Blooms (Apr)May-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as woodland or grassland.	No further actions are recommended.
bent-flowered fiddleneck *Amsinckia lunaris*	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 5 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as woodland or grassland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
coast rockcress *Arabis blepharophylla*	Rank 4.3	Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 5 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or upland forest.	No further actions are recommended.
Anderson's manzanita *Arctostaphylos andersonii*	Rank 1B.2	Broadleafed upland forest, chaparral, north coast coniferous forest. Elevation ranges from 195 to 2495 feet (60 to 760 meters). Blooms Nov-May.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
Montara manzanita *Arctostaphylos montaraensis*	Rank 1B.2	Chaparral (maritime), coastal scrub. Elevation ranges from 260 to 1640 feet (80 to 500 meters). Blooms Jan-Mar.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
Kings Mountain manzanita *Arctostaphylos regismontana*	Rank 1B.2	Broadleafed upland forest, chaparral, north coast coniferous forest. Elevation ranges from 1000 to 2395 feet (305 to 730 meters). Blooms Dec-Apr.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral or upland forest.	No further actions are recommended.
ocean bluff milk-vetch *Astragalus nuttallii var. nuttallii*	Rank 4.2	Coastal bluff scrub, coastal dunes. Elevation ranges from 5 to 395 feet (3 to 120 meters). Blooms Jan-Nov.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub or coastal dunes.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	Rank 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides). Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms (Apr)Jun-Oct.	**Unlikely.** Suitable habitat not present within the Study Area. Areas within the Study Area that are considered mesic are frequently disturbed and dominated by non-native invasive plant species.	No further actions are recommended.
Brewer's calandrinia *Calandrinia breweri*	Rank 4.2	Chaparral, coastal scrub. Elevation ranges from 30 to 4005 feet (10 to 1220 meters). Blooms (Jan)Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub or chaparral.	No further actions are recommended.
Oakland star-tulip *Calochortus umbellatus*	Rank 4.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 325 to 2295 feet (100 to 700 meters). Blooms Mar-May.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
johnny-nip *Castilleja ambigua var. ambigua*	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Elevation ranges from 0 to 1425 feet (0 to 435 meters). Blooms Mar-Aug.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, marsh, or grassland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as seeps, marsh, or grassland.	No further actions are recommended.
Point Reyes bird's-beak *Chloropyron maritimum ssp. palustre*	Rank 1B.2	Marshes and swamps (coastal salt). Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun-Oct.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as marsh or swamp.	No further actions are recommended.
San Francisco Bay spineflower *Chorizanthe cuspidata var. cuspidata*	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 5 to 705 feet (3 to 215 meters). Blooms Apr-Jul(Aug).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or coastal dunes.	No further actions are recommended.
Franciscan thistle *Cirsium andrewsii*	Rank 1B.2	Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, upland forest, or coastal dunes.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Crystal Springs fountain thistle *Cirsium fontinale var. fontinale*	FE, SE, Rank 1B.1	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland. Elevation ranges from 145 to 575 feet (45 to 175 meters). Blooms (Apr)May-Oct.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
San Francisco collinsia *Collinsia multicolor*	Rank 1B.2	Closed-cone coniferous forest, coastal scrub. Elevation ranges from 95 to 820 feet (30 to 250 meters). Blooms (Feb)Mar-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coniferous forest or coastal scrub.	No further actions are recommended.
clustered lady's-slipper *Cypripedium fasciculatum*	Rank 4.2	Lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 325 to 7990 feet (100 to 2435 meters). Blooms Mar-Aug.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coniferous forest.	No further actions are recommended.
mountain lady's-slipper *Cypripedium montanum*	Rank 4.2	Broadleafed upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 605 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coniferous forest or woodland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
western leatherwood *Dirca occidentalis*	Rank 1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. Elevation ranges from 80 to 1395 feet (25 to 425 meters). Blooms Jan-Mar(Apr).	**Unlikely.** Potentially suitable riparian habitat is present within the Study Area, and this species is known from the region. However, all potentially suitable habitat within the Study Area is heavily disturbed and dominated by non-native invasive plant species. The nearest documented occurrence is 5-miles north on Montara Mountain.	No further actions are recommended.
California bottle-brush grass *Elymus californicus*	Rank 4.3	Broadleafed upland forest, cismontane woodland, north coast coniferous forest, riparian woodland. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms May-Aug(Nov).	**Unlikely.** Potentially suitable riparian habitat is present within the Study Area, and this species is known from the region. However, all potentially suitable habitat within the Study Area is heavily disturbed and dominated by non-native invasive plant species.	No further actions are recommended.
San Mateo woolly sunflower *Eriophyllum latilobum*	FE, SE, Rank 1B.1	Cismontane woodland (often serpentine, on roadcuts), coastal scrub, lower montane coniferous forest. Elevation ranges from 145 to 1085 feet (45 to 330 meters). Blooms May-Jun.	**No Potential.** The Study Area lacks serpentine habitat not present within Study Area. The Study Area does not include areas characterized as coniferous forest, coastal scrub, or woodland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
San Francisco wallflower *Erysimum franciscanum*	Rank 4.2	Chaparral, coastal dunes, coastal scrub, valley and foothill grassland. Elevation ranges from 0 to 1805 feet (0 to 550 meters). Blooms Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal dunes, coastal scrub, or grassland	No further actions are recommended.
Hillsborough chocolate lily *Fritillaria biflora var. ineziana*	Rank 1B.1	Cismontane woodland, valley and foothill grassland. Elevation ranges from 490 to 490 feet (150 to 150 meters). Blooms Mar-Apr.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
Marin checker lily *Fritillaria lanceolata var. tristulis*	Rank 1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 45 to 490 feet (15 to 150 meters). Blooms Feb-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
fragrant fritillary *Fritillaria liliacea*	Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 5 to 1345 feet (3 to 410 meters). Blooms Feb-Apr.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub or grassland.	No further actions are recommended.
San Francisco gumplant *Grindelia hirsutula var. maritima*	Rank 3.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland. Elevation ranges from 45 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub or grassland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
short-leaved evax *Hesperevax sparsiflora var. brevifolia*	Rank 1B.2	Coastal bluff scrub (sandy), coastal dunes, coastal prairie. Elevation ranges from 0 to 705 feet (0 to 215 meters). Blooms Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
Marin western flax *Hesperolinon congestum*	FT, ST, Rank 1B.1	Chaparral, valley and foothill grassland. Elevation ranges from 15 to 1215 feet (5 to 370 meters). Blooms Apr-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral or grassland.	No further actions are recommended.
Kellogg's horkelia *Horkelia cuneata var. sericea*	Rank 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub. Elevation ranges from 30 to 655 feet (10 to 200 meters). Blooms Apr-Sep.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral, coniferous forest, or coastal scrub.	No further actions are recommended.
Point Reyes horkelia *Horkelia marinensis*	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 15 to 2475 feet (5 to 755 meters). Blooms May-Sep.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
coast iris *Iris longipetala*	Rank 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie, coniferous forest, or seeps.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
perennial goldfields *Lasthenia californica ssp. macrantha*	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1705 feet (5 to 520 meters). Blooms Jan-Nov.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
serpentine leptosiphon *Leptosiphon ambiguus*	Rank 4.2	Cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 390 to 3705 feet (120 to 1130 meters). Blooms Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.
coast yellow leptosiphon *Leptosiphon croceus*	SS, Rank 1B.1	Coastal bluff scrub, coastal prairie. Elevation ranges from 30 to 490 feet (10 to 150 meters). Blooms Apr-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
rose leptosiphon *Leptosiphon rosaceus*	Rank 1B.1	Coastal bluff scrub. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Apr-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal prairie or coastal scrub.	No further actions are recommended.
Crystal Springs lessingia *Lessingia arachnoidea*	Rank 1B.2	Cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 195 to 655 feet (60 to 200 meters). Blooms Jul-Oct.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as woodland, grassland, or coastal scrub.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
woolly-headed lessingia *Lessingia hololeuca*	Rank 3	Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Elevation ranges from 45 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as woodland, grassland, coniferous forest, or coastal scrub.	No further actions are recommended.
coast lily *Lilium maritimum*	Rank 1B.1	Broadleafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps (freshwater), north coast coniferous forest. Elevation ranges from 15 to 1560 feet (5 to 475 meters). Blooms May-Aug.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as woodland, coastal prairie, marsh, coniferous forest, or coastal scrub.	No further actions are recommended.
Ornduff's meadowfoam *Limnanthes douglasii ssp. ornduffii*	Rank 1B.1	Meadows and seeps. Elevation ranges from 30 to 65 feet (10 to 20 meters). Blooms Nov-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as meadows or seeps.	No further actions are recommended.
San Mateo tree lupine *Lupinus arboreus var. eximius*	Rank 3.2	Chaparral, coastal scrub. Elevation ranges from 295 to 1805 feet (90 to 550 meters). Blooms Apr-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral or coastal scrub.	No further actions are recommended.
Indian Valley bush-mallow *Malacothamnus aboriginum*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 490 to 5575 feet (150 to 1700 meters). Blooms Apr-Oct.	**No Potential.** Suitable habitat not present within Study Area. Study Area is out of the species elevation range.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
arcuate bush-mallow *Malacothamnus arcuatus*	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 45 to 1165 feet (15 to 355 meters). Blooms Apr-Sep.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral or cismontane woodland.	No further actions are recommended.
Davidson's bush-mallow *Malacothamnus davidsonii*	Rank 1B.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland. Elevation ranges from 605 to 3740 feet (185 to 1140 meters). Blooms Jun-Jan.	**Unlikely.** Potentially suitable riparian habitat is present within the Study Area, and this species is known from the region. However, all potentially suitable habitat within the Study Area is heavily disturbed and dominated by non-native invasive plant species.	No further actions are recommended.
Hall's bush-mallow *Malacothamnus hallii*	Rank 1B.2	Chaparral, coastal scrub. Elevation ranges from 30 to 2495 feet (10 to 760 meters). Blooms (Apr)May-Sep(Oct).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as chaparral or coastal scrub.	No further actions are recommended.
marsh microseris *Microseris paludosa*	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet (5 to 355 meters). Blooms Apr-Jun(Jul).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, or coastal scrub.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
woodland woolythreads *Monolopia gracilens*	Rank 1B.2	Broadleafed upland forest (openings), chaparral (openings), cismontane woodland, north coast coniferous forest (openings), valley and foothill grassland. Elevation ranges from 325 to 3935 feet (100 to 1200 meters). Blooms (Feb)Mar-Jul.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, grassland, or coastal scrub.	No further actions are recommended.
Dudley's lousewort *Pedicularis dudleyi*	SR, Rank 1B.2	Chaparral (maritime), cismontane woodland, north coast coniferous forest, valley and foothill grassland. Elevation ranges from 195 to 2955 feet (60 to 900 meters). Blooms Apr-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, grassland, or coastal scrub.	No further actions are recommended.
white-rayed pentachaeta *Pentachaeta bellidiflora*	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland (often serpentine). Elevation ranges from 110 to 2035 feet (35 to 620 meters). Blooms Mar-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, grassland, or coastal scrub.	No further actions are recommended.
Choris' popcornflower *Plagiobothrys chorisianus var. chorisianus*	Rank 1B.2	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 5 to 525 feet (3 to 160 meters). Blooms Mar-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or chaparral.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Oregon polemonium *Polemonium carneum*	Rank 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation ranges from 0 to 6005 feet (0 to 1830 meters). Blooms Apr-Sep.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or coniferous forest.	No further actions are recommended.
Hickman's cinquefoil *Potentilla hickmanii*	FE, SE, Rank 1B.1	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps (vernally mesic), marshes and swamps (freshwater). Elevation ranges from 30 to 490 feet (10 to 149 meters). Blooms Apr-Aug.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, marsh, or coniferous forest.	No further actions are recommended.
Lobb's aquatic buttercup *Ranunculus lobbii*	Rank 4.2	Cismontane woodland, north coast coniferous forest, valley and foothill grassland, vernal pools. Elevation ranges from 45 to 1540 feet (15 to 470 meters). Blooms Feb-May.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, grassland, or coastal scrub.	No further actions are recommended.
chaparral ragwort *Senecio aphanactis*	Rank 2B.2	Chaparral, cismontane woodland, coastal scrub. Elevation ranges from 45 to 2625 feet (15 to 800 meters). Blooms Jan-Apr(May).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, chaparral, or cismontane woodland.	No further actions are recommended.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Scouler's catchfly *Silene scouleri ssp. scouleri*	Rank 2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms (Mar-May)Jun-Aug(Sep).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or grassland.	No further actions are recommended.
San Francisco campion *Silene verecunda ssp. verecunda*	Rank 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 95 to 2115 feet (30 to 645 meters). Blooms (Feb)Mar-Jun(Aug).	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as cismontane woodland, coniferous forest, grassland, or coastal scrub.	No further actions are recommended.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as marsh or grassland. No vernal pools are present within or adjacent to the Study Area.	No further actions are recommended.
San Francisco owl's-clover *Triphysaria floribunda*	Rank 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 30 to 525 feet (10 to 160 meters). Blooms Apr-Jun.	**No Potential.** Suitable habitat not present within Study Area. The Study Area does not include areas characterized as coastal scrub, coastal prairie, or grassland.	No further actions are recommended.
Wildlife				

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Mammals				
fringed myotis *Myotis thysanodes*	WBWG	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwood/sequoia groves. Buildings, mines, and large snags are important day and night roosts.	**No Potential.** No abandoned buildings, mines, rock outcrops or other suitable cavernous features are present. No large snags or conifer forest is present. The absence of such habitat features precludes the species from the Study Area.	No further recommendations.
hoary bat *Lasiurus cinereus*	WBWG	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Unlikely.** Vegetation within the Study Area is primarily riparian in nature, which does not support the thermoregulatory needs of this species.	No further recommendations.
pallid bat *Antrozous pallidus*	SSC, WBWG	Occupies a variety of habitats at low elevation including grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting.	**No Potential.** No suitable trees, snags, mines, rock formations, or abandoned buildings are present to support roosting.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Townsend's big-eared bat *Corynorhinus townsendii*	SSC, WBWG	Primarily found in rural settings in a wide variety of habitats including oak woodlands and mixed coniferous-deciduous forest. Day roosts highly associated with caves and mines. Building roost sites must be cave like. Very sensitive to human disturbance.	**Unlikely.** No caves or mines are present, and the Study Area has high levels of disturbance from Pacific Coast Highway, therefore the Study Area does not contain suitable roost habitat.	No further recommendations.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	SSC	Typically occurs in forest habitats of moderate canopy and moderate to dense understory. Also found in chaparral habitats.	**Moderate Potential.** Although no nests were identified during the site visit, the Study Area contains dense riparian understory that could be used by this species as nesting habitat.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable, uncultivated soils. Prey on burrowing rodents.	**No Potential.** The Study Area does not contain suitable grassland habitat for this species and it is not contiguous with occupied habitat. High development and disturbance levels preclude badger from the Study Area.	No further recommendations.
southern sea otter *Enhydra lutris nereis*	FT, CFP, MMC SSC, SMC LCP	Nearshore marine environments from about Año Nuevo, San Mateo County. To Point Sal, Santa Barbara County. Needs canopies of giant kelp and bull kelp for rafting and feeding. Prefers rocky substrates with abundant invertebrates.	**No Potential.** The Study Area does not contain ocean habitat required to support this species.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Steller (=Northern) sea lion *Eumetopias jubatus*	FD, MMC SSC	Breeds on Año Nuevo, San Miguel and Farallon islands, Point Saint George, and Sugarloaf. Hauls-out on islands and rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply and with no human disturbance.	**No Potential.** The Study Area does not contain ocean habitat required to support this species.	No further recommendations.
Guadalupe fur seal *Arctocephalus townsendi*	FT, ST, CFP, SMC LCP	Breed on Isla de Guadalupe off the coast of Mexico, occasionally found on San Miguel, San Nicolas, and San Clemente islands. Prefers shallow, nearshore island water with cool and sheltered rocky areas for haul-outs.	**No Potential.** The Study Area does not contain open ocean, or beach habitat which is used by the species.	No further recommendations.
Birds				
burrowing owl *Athene cunicularia*	SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**No Potential.** The Study Area does not contain suitable burrows, and no ground squirrels were observed within or adjacent to the Study Area; all adjacent grassy areas are landscaped. Additionally, dense riparian trees and vegetation block the views of owls, making the habitat unsuitable for nesting.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
white-tailed kite *Elanus leucurus*	CFP	Year-long resident of coastal and valley lowlands. Preys on small diurnal mammals and occasional birds, insects, reptiles, and amphibians.	**Moderate Potential.** While continual anthropogenic disturbances are present nearby, this species typically nests in close proximity to human activities and has ample foraging areas within nearby open spaces.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
California black rail *Laterallus jamaicensis coturniculus*	ST, CFP, SMC LCP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	**No Potential.** No marsh habitats are present within the Study Area to support this species.	No further recommendations.
California least tern *Sternula antillarum browni*	FE, SE, CFP, SMC LCP	Summer resident along the coast from San Francisco Bay south to northern Baja California; inland breeding also very rarely occurs. Nests colonially on barren or sparsely vegetated areas with sandy or gravelly substrates near water, including beaches, islands, and gravel bars. In San Francisco Bay, has also nested on salt pond margins.	**No Potential.** No sand bar, mud flat, or other open areas are present within the Study Area to support this species.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
California Ridgway's (clapper) rail *Rallus obsoletus obsoletus*	FE, SE, CFP	Year-round resident in tidal marshes of the San Francisco Bay estuary. Requires tidal sloughs and intertidal mud flats for foraging, and dense marsh vegetation for nesting and cover. Typical habitat features abundant growth of cordgrass and pickleweed. Feeds primarily on molluscs and crustaceans.	**No Potential.** The Study Area is outside the known range of this species. No salt marsh is present to support the species.	No further recommendations.
California brown pelican *Pelecanus occidentalis californicus*	FD, SD, CFP, SMC LCP	Nests colonially on coastal islands of small to moderate size, which afford immunity from attack by ground-dwelling predators. Does not breed north of the Channel Islands. Winter visitor and post-breeding disperser to San Francisco Bay region.	**No Potential.** The Study Area does not contain coastal island habitat and is out of the breeding range for this species.	No further recommendations.
marbled murrelet *Brachyramphus marmoratus*	FT, SE	Breed in old-growth redwood stands containing platform-like branches along the coast. Winters in coastal waters.	**No Potential.** The Study Area and vicinity do not contain suitable old growth redwood or fir trees to support nesting by this species.	No further recommendations.
short-tailed albatross *Diomedea albatrus*	FE	Nests on Japanese islands. Very rare winter visitor to offshore California waters.	**No Potential.** The Study Area is outside the typical breeding range for this species. The Study Area does not contain offshore islands required for nesting by the species.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
western snowy plover *Charadrius alexandrinus nivosus*	FT, SSC, RP	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees, and shores of large alkali lakes. Requires sandy, gravelly, or friable soils for nesting.	**No Potential.** There is no sand, dune or beach habitat present within the Study Area to support nesting by the species.	No further recommendations.
Alameda song sparrow *Melospiza melodia pusillula*	SSC	Year-round resident in tidal-influenced marshes along the eastern and southern portions of San Francisco Bay.	**No Potential.** The Study Area does not contain tidal marsh habitat used for nesting by this species. The Study Area is also outside of the typical range occupied by this species.	No further recommendations.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	SSC	Resident of San Francisco bay region fresh and salt-water marshes. Requires thick, continuous cover down to water surface for foraging, tall grasses, tule patches, willows for nesting.	**Moderate Potential.** While marsh habitats are not present within the Study Area, the dense riparian vegetation could provide a nesting substrate for this species.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
great blue heron *Ardea herodias*	breeding colonies protected by CDFW	Year-round resident. Nests colonially or semi-colonially in tall trees and on cliffs, also sequestered terrestrial substrates. Breeding sites usually in close proximity to foraging areas: marshes, lake margins, tidal flats, and rivers. Forages primarily on fishes and other aquatic prey, also smaller terrestrial vertebrates.	**Unlikely.** Rookeries for this species require large trees adjacent to waterbodies with sufficient access to forage fishes in order to provide food for the colony. No suitable waterbodies are present to support a colony of this species. The species may be observed individually foraging.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Reptiles and Amphibians				
Western pond turtle *Actinemys [Emys] marmorata*	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**Moderate Potential.** Although steep channel morphology likely precludes WPT from using the Study Area as a breeding site due to the difficulty of reaching upland areas, WPT may use aquatic portions of Pilarcitos Creek for travelling between other locations.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE, SE, CFP	Vicinity of freshwater marshes, ponds, and slow moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot.	**Moderate Potential.** This species has been documented in coastal areas near the Study Area. A ranid frog prey base is likely present within the Study Area, and the stream appears slow moving enough to provide suitable habitat for this aquatic species.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
California tiger salamander *Ambystoma californiense*	FE/FT, ST, RP	Populations in Santa Barbara and Sonoma counties currently listed as endangered; threatened in remainder of range. Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Adults are fossorial and utilize mammal burrows and other subterranean refugia. Breeding occurs primariiy in vernal pools and other seasonal water features.	**No Potential.** The Study Area is outside of the known range for this species.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Santa Cruz black salamander *Aneides flavipunctatus niger*	SSC	Climbing salamanders of the genus *Aneides* frequent damp woodlands and are usually found hiding under various debris (i.e. bark, woodrat nests, logs). The Santa Cruz black salamander exists south of the San Francisco Bay and was only recently recognized as a separate and protected species. Santa Cruz black salamander is highly sedentary, preferring to stay hidden under riparian debris.	**Unlikely.** This species is generally present in forested environments or woodlands, which are not present within the Study Area.	No further recommendations.
California giant salamander *Dicamptodon ensatus*	SSC	Occurs in the north-central Coast Ranges. Moist coniferous and mixed forests are typical habitat; also uses woodland and chaparral. Adults are terrestrial and fossorial, breeding in cold, permanent, or semi-permanent streams. Larvae usually remain aquatic for over a year.	**No Potential.** The habitat does not contain true forest habitat, and is surrounded by significant barriers to dispersal in the form of roads and human development. The nearest occurrence is approximately 4.2 miles away in a headwater stream (CDFW 2021).	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
California red-legged frog *Rana draytonii*	FT, SSC	Associated with quiet perennial to intermittent ponds, stream pools, and wetlands with adjacent upland habitat containing refugia. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	**High Potential.** This species has been documented within 0.1 mile of the Study Area. Although extensive emergent vegetation is not present, Pilarcitos Creek is perennial and provides sufficient hydroperiod for larval development.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.
foothill yellow-legged frog *Rana boylii*	SC, SSC	Found in or adjacent to rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	**No Potential.** Pilarcitos creek within the Study Area does not have a rocky substrate that is typical of habitat for this species.	No further recommendations.
Fish				
tidewater goby *Eucyclogobius newberryi*	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**No Potential.** There is no lagoon habitat present within the Study Area.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Delta smelt *Hypomesus transpacificus*	FT, SE, RP	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt; most often at salinities < 2 ppt.	**No Potential.** The Study Area is outside of the species known range.	No further recommendations.
longfin smelt *Spirinchus thaleichthys*	ST, RP	Found in open waters of estuaries, mostly in the middle or bottom of the water column. This species prefers salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	**No Potential.** The Study Area is not within the known distribution of this species.	No further recommendations.
steelhead, Central California Coast ESU *Oncorhynchus mykiss irideus*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	**High Potential.** Steelhead have been documented in Pilarcitos Creek, and may use the Study Area as a passage between the ocean and breeding grounds.	See section 5.3.2 for further discussion of this species, and section 6.3 for associated recommended mitigation.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Invertebrates				
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE, SMC LCP	Inhabits coastal mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	**No Potential.** The Study Area is outside of this species known range and does not contain suitable rocky outcrops or north facing terrain to support the host plant.	No further recommendations.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE	Foggy, coastal dunes and hills of the Point Reyes Peninsula.	**No Potential.** The Study Area is outside of this species known range	No further recommendations.
Monarch butterfly *Danaus plexippus*	Winter roosts protected by CDFW	Winter roost sites located in wind-protected tree groves (Eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Winter roosts monitored by CDFW.	**Unlikely.** The Study Area does not contain groves of larger trees that are typical of roost sites of this species, or that would provide suitable wind block or thermoregulation.	No further recommendations.
Mission blue butterfly *Plebejus icarioides missionensis*	FE	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons*, *L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	**No Potential.** The Study Area does not contain conditions for the establishment of the host plant for this species.	No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**	RECOMMENDATIONS
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT, RP	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. *Plantago erecta* is the primary host plant; *Orthocarpus densiflorus* and *O. purpurscens* are the secondary host plants.	**No Potential.** The Study Area lacks serpentine soils, which precludes the presence of species-specific host plants required to sustain a population.	No further recommendations.
San Francisco tree lupine moth *Grapholita edwardsiana*	SMC LCP	Occurs only on sandy northern peninsula sites. Tree lupine (*Lupinus arboreus*) host the larvae of this species. This species is addressed in the San Mateo County LCP.	**No Potential.** The Study Area does not contain sandy habitats or the larval host plant for this species.	No further recommendations.
California brackish water snail *Tryonia imitator*	SMC LCP	Occurs in brackish water, such as Pescadero Marsh.	**No Potential.** There is no brackish water habitat in the Study Area.	No further recommendations.
globose dune beetle *Coelus globosus*	SMC LCP	Inhabits California's coastal dune system.	**No Potential.** The Study Area does not contain sandy or dune habitats required by this species.	No further recommendations.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
SE	State Endangered
ST	State Threatened
SD	State Delisted
RP	Species for which a recovery plan has been published
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority species
MMC SSC	Marine Mammal Commission Species of Special Concern
SMC LCP	San Mateo County Local Coastal Plan Covered Species

**** Key to Potential for Occurrence:**

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

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APPENDIX E– PROJECT PLANS AND CROSS-SECTIONS

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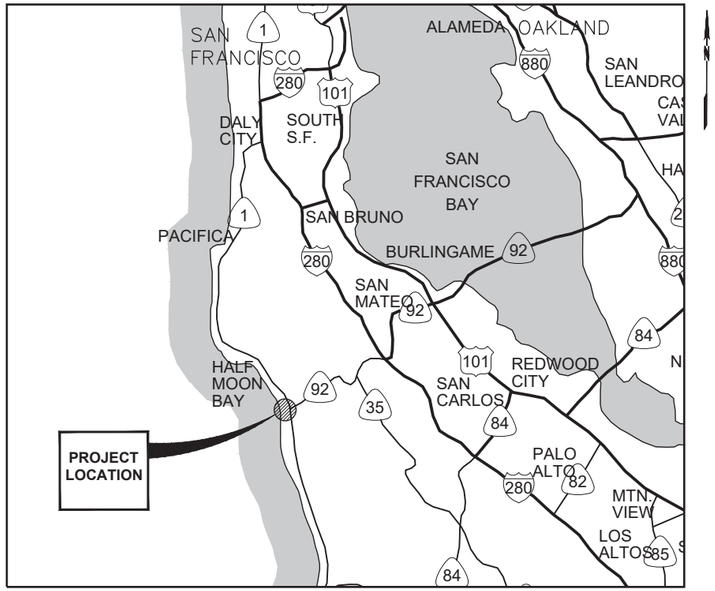
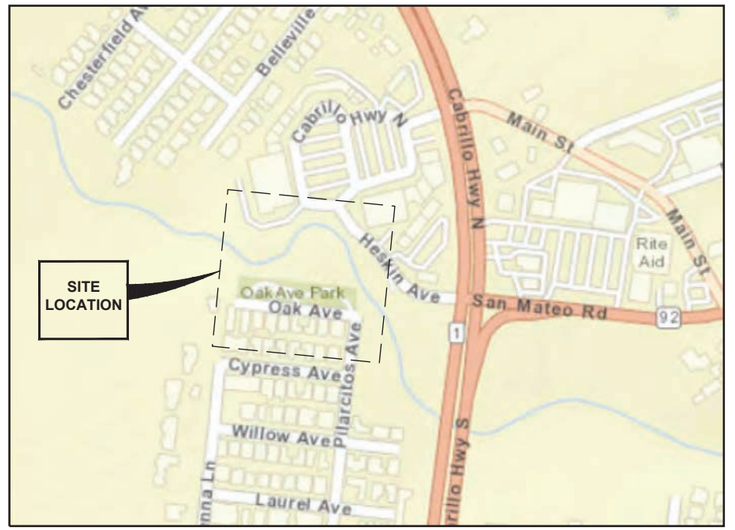
REPLACEMENT OF 8-INCH PIPELINE UNDER PILARCITOS CREEK AT PILARCITOS AVENUE (STRAWFLOWER)

COASTSIDE COUNTY WATER DISTRICT
HALF MOON BAY, CA
CIP 18-01

MARCH 2021



LOCATION MAP
NO SCALE



VICINITY MAP
NO SCALE

SHEET INDEX

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Call Two Working Days Before You Dig!
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REGISTERED PROFESSIONAL ENGINEER
JONATHAN P. N. SUTTER
C 81606
EXP. 09/30/2021
CIVIL
STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

ekl environment & water
2001 JUNIPERO SERRA BOULEVARD, SUITE 300
DALY CITY, CALIFORNIA 94014
(650) 292-9100 • FAX (650) 552-9012

REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

TITLE SHEET, LOCATION MAP, AND DRAWING LIST

	DATE	DESCRIPTION	APPRD
1	MAR 2021	100% DESIGN SUBMITTAL	JPNS

DATE: MAR 2021
SCALE: AS SHOWN
DRAWN: TCA
DESIGNED: JPNS
APPROVED: JPNS
JOB NO.: B80108.11

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

SHEET NUMBER
G-1
1 OF 8

GENERAL NOTES

1. EXISTING UTILITIES SHOWN ON THESE PLANS ARE BASED ON AVAILABLE INFORMATION AND ARE NOT GUARANTEED TO BE EITHER ACCURATE NOR COMPLETE. EXISTING UTILITY MAINS ARE SHOWN; NOT ALL LATERALS FOR EXISTING UTILITIES ARE SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXACT UTILITY LOCATION. THIS VERIFICATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE APPROPRIATE UTILITY COMPANY AS REQUIRED. FIELD VERIFY BY POTHOLING AND PHYSICALLY EXPOSING THE LOCATION AND ELEVATION OF ALL EXISTING UNDERGROUND UTILITY SYSTEMS AND INDIVIDUAL SERVICES CROSSING THE ALIGNMENT OF THE NEW WATER LINE AS PART OF THE POTHOLING REPORT DESCRIBED IN THE SPECIFICATIONS. CALL U.S.A. (UNDERGROUND SERVICE ALERT) FOR UTILITY LOCATION AT LEAST 48 HOURS BEFORE DIGGING. PHONE 1-800-227-2600 (OR DIAL 811).
2. CONTRACTOR MAY DEVIATE FROM PROPOSED WATER MAIN ALIGNMENT ONLY WITH PRIOR WRITTEN APPROVAL FROM THE DISTRICT. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING UNDERGROUND UTILITIES AND SERVICES THAT CROSS OR PARALLEL THE NEW WATER LINES OR THAT MAY BE WITHIN THE INFLUENCE OF CONSTRUCTION ACTIVITIES INCLUDING DEWATERING, EXCAVATING, SHORING AND BACKFILLING ACTIVITIES. CONTRACTOR SHALL SUBMIT POTHOLING RECORDS TO OWNER PRIOR TO CONSTRUCTION AND ON RECORD DRAWINGS.
3. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION. DAMAGE TO EXISTING UTILITIES RESULTING FROM THE CONTRACTOR'S CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE.
4. CONTRACTOR'S WORK INCLUDES ALL INCIDENTAL AND APPURTENANT WORK NECESSARY TO PROVIDE A COMPLETE AND FULLY-FUNCTIONING FACILITY. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR ANY ACTIVITIES OTHER THAN THOSE LISTED IN THE BID SCHEDULE WITHOUT AN AUTHORIZED CHANGE ORDER.
5. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, APPURTENANCES, AND APPARATUS NOT SPECIFICALLY MENTIONED ON THE PLANS OR SPECIFICATIONS, BUT WHICH ARE NECESSARY TO COMPLETE THE CONTRACTED WORK AND PROVIDE A FULLY-FUNCTIONING INSTALLATION READY FOR FULL-TIME OPERATION.
6. THE CONTRACTOR SHALL SUPPLY AND MAINTAIN SANITARY FACILITIES FOR WORKERS AND VISITORS AT THE CONSTRUCTION SITE. SERVICE AT LEAST TWICE WEEKLY. CONTRACTOR SHALL COMPLY WITH ALL STATE AND COUNTY ORDERS RELATED TO COVID-19.
7. THE CONTRACTOR SHALL SATISFY ITSELF AS TO THE EXISTING CONDITIONS PRIOR TO BIDDING THE PROJECT.
8. ALL EXCESS EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HANDLED, TRANSPORTED, AND DISPOSED FROM THE SITE IN ACCORDANCE WITH LAWS AND REGULATIONS AT THE CONTRACTOR'S EXPENSE. CONTRACTOR MAY ASSUME, FOR BIDDING PURPOSES ONLY, THAT EXCAVATED SOIL IS NON-HAZARDOUS. HOWEVER, SUCH ASSUMPTION DOES NOT RELIEVE CONTRACTOR'S FULL AND COMPLETE RESPONSIBILITY FOR COMPLYING WITH LAWS AND REGULATIONS, INCLUDING CHARACTERIZATION OF EXCESS MATERIAL FOR MANAGEMENT AND DISPOSAL. CONTRACTOR SHALL PROMPTLY NOTIFY AND CONFER WITH ENGINEER IF ANY EVIDENCE OF SOIL CONTAMINATION IS OBSERVED.
9. SAWCUT LINES SHALL BE DETERMINED BY THE WIDTH OF THE TRENCH AND DISTRICT STANDARD DETAILS OR AS SHOWN ON THE DRAWINGS.
10. UNLESS OTHERWISE SHOWN ALL NEW PIPES SHALL HAVE A MINIMUM COVER OF 36 INCHES.
11. THE CONTRACTOR SHALL RESTORE ALL DAMAGED, REMOVED, OR OTHERWISE DISTURBED WALLS, FENCES, SERVICES, UTILITIES, IMPROVEMENTS, OR FEATURES OF WHATEVER NATURE DUE TO CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER. UNLESS OTHERWISE NOTED, ALL PAVEMENT, GUTTERS, WALKS, FENCES AND OTHER SURFACE IMPROVEMENTS THAT ARE DISTURBED OR DAMAGED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITIONS BY CONTRACTOR, AT THE CONTRACTOR'S EXPENSE.
12. CONCRETE OR OTHER GUTTER REMOVED FOR TRENCHING IN STREETS SHALL BE REPLACED IN KIND. WHEN BRICK GUTTER OR CONCRETE GUTTER AND/OR CURB IS REMOVED FOR INSTALLATION OF SERVICE CONNECTION AND/OR WATER MAIN, REMOVE AND REPLACE IN KIND.
13. CONTRACTOR SHALL PROVIDE A MINIMUM OF 12" VERTICAL CLEARANCE AT CROSSINGS BETWEEN PROPOSED WATER MAINS AND ALL UTILITIES.
14. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
15. WORK IN THE CITY OF HALF MOON BAY RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF HALF MOON BAY STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS.
16. AT CONNECTIONS TO EXISTING BURIED PIPE, CONTRACTOR SHALL EXPOSE THE EXISTING PIPE AND VERIFY LOCATIONS, INVERT, MATERIALS, AND DIMENSIONS. THE CONTRACTOR SHALL FURNISH ALL NECESSARY COUPLINGS, FITTINGS, APPURTENANCES, TOOLS, AND LABOR TO COMPLETE THE CONNECTIONS WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT, AT NO ADDITIONAL COST TO THE OWNER.
17. INSTALL AND MAINTAIN TEMPORARY SILT FENCING ALONG THE PERIMETER OF THE WORK AREA ADJACENT TO THE CREEK BANK AS SHOWN ON PLANS. NO PROJECT ACTIVITIES SHALL BE PERMITTED IN THE AREA BETWEEN THE SILT FENCE AND THE CREEK, EXCEPT FOR FOOT TRAFFIC RELATED TO HDD GUIDANCE ACTIVITIES. ALL CONSTRUCTION ACTIVITIES SHALL COMPLETELY AVOID IMPACTS TO RIPARIAN VEGETATION IN ACCORDANCE WITH SPECIFICATION SECTION 01410.
18. THRUST BLOCKS SHALL BE CONSTRUCTED AT ALL BENDS, TEES, REDUCERS, VALVES, BLIND FLANGES, CAPS, AND PLUGS PER DISTRICT STANDARDS WHETHER OR NOT THEY ARE SPECIFICALLY SHOWN ON THE PLANS.
19. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE SAN MATEO COUNTY AND CITY OF HALF MOON BAY MUNICIPAL REGIONAL PERMIT (MRP) NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND SHALL FOLLOW STORM WATER BEST MANAGEMENT PRACTICES AS SPECIFIED IN THE CITY OF HALF MOON BAY STANDARD SPECIFICATIONS & PROJECT SPECIFICATIONS.
20. FOR LANE CLOSURES, THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN AND OBTAIN APPROVAL FROM THE PERMITTING AGENCIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE FLAG PEOPLE, CONES, AND/OR BARRICADES, AS NECESSARY TO CONTROL TRAFFIC AND PREVENT HAZARDOUS CONDITIONS, PER THE CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS, SPECIFICATION, AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITIONS.
21. THE CONTRACTOR SHALL CONTROL DUST AT ALL TIMES AND SWEEP THE STREETS AS OFTEN AS NECESSARY DURING CONSTRUCTION, AS REQUIRED BY THE OWNER REPRESENTATIVE.
22. ALL PAVEMENT MARKING AND STRIPING DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR IN ACCORDANCE WITH CITY OF HALF MOON BAY STANDARDS, & PROJECT SPECIFICATIONS, AS DIRECTED BY ENGINEER.
23. NO TRENCHES OR HOLES IN THE PUBLIC RIGHT OF WAY SHALL BE LEFT OPEN OVERNIGHT; USE STEEL PLATING OR HOT-MIX ASPHALT AS REQUIRED TO PROTECT OPEN EXCAVATIONS OVERNIGHT.
24. WHEN UTILITY CONFLICTS ARE ENCOUNTERED, INSTALL WATER LINE ABOVE OR BELOW EX UTILITY PER DETAIL 2/C-4. WATER LINE SHALL BE INSTALLED ABOVE SANITARY SEWER, UNLESS APPROVED IN ADVANCE BY ENGINEER.
25. ALL WORK SHALL BE PERFORMED WITHIN THE LIMITS OF THE PERMANENT AND TEMPORARY EASEMENTS AND THE CITY OF HALF MOON BAY ROW AS SHOWN ON THE DRAWINGS.

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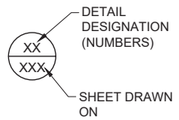
ABBREVIATIONS

APPROX.	APPROXIMATE
APN	ASSESSOR'S PARCEL NUMBER
CB	CATCH BASIN
CIP	CAST IRON PIPE
CO	CLEANOUT
DIP	DUCTILE IRON PIPE
DR	DIMENSION RATIO
(E)	EXISTING
ELEV.	ELEVATION
FL	FLANGE
FH	FIRE HYDRANT
G	GAS
GPRS	GENERAL PACKET RADIO SERVICE
GV	GATE VALVE
HDD	HORIZONTAL DIRECTIONAL DRILLING
HDPE	HIGH DENSITY POLYTHENE
HORIZ	HORIZONTAL
IN.	INCHES
INV	INVERY
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
(N)	NEW
NTS	NOT TO SCALE
PL	PLASTIC
ROW	RIGHT-OF-WAY
SD	STORM DRAIN
SSMH	SANITARY SEWER MANHOLE
SPEC(S)	SPECIFICATION(S)
SS	SANITARY SEWER
STA.	STATION
TYP.	TYPICAL
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VIF	VERIFY IN FIELD
W	WATER
WM	WATER METER

REFERENCE SYMBOLS



GENERAL LEGEND

EXISTING

BACKFLOW PREVENTER
BENCHMARK
BOLLARD
CLEAN OUT
CONTOUR (45)
CURB
DOOR
DRAIN INLET
ELECTRIC METER/BOX
ELECTROLIER
ELEVATION W/ DESCRIPTION (× 40.77 EP)
NATURAL GROUND SHOT (× 42.9)
FIRE HYDRANT
FOUND MONUMENT
FOUND MONUMENT IN WELL
GUY WIRE
IRRIGATION VALVE (IRR)
SANITARY SEWER MANHOLE (S)
SIGN
STREET/SITE LIGHT PULL BOX
TREES
UNDERGROUND UTILITY LINE LABEL AND DIRECTION
UTILITY POLE
WALL
GEOTECHNICAL BOREHOLE LOCATION

BOUNDARY LINES
ADJACENT PROPERTY LINE
CENTER LINE
EASEMENT LINE
PROPERTY LINE
RIGHT OF WAY LINE

HARDSCAPE LINES
BACK OF CURB
FACE OF CURB
FLOWLINE
LIP OF GUTTER
SIDEWALK/CONCRETE

MISCELLANEOUS LINES
BUILDING OUTLINE
FENCE, CHAIN-LINK (X — X)
FENCE, METAL (HEIGHT NOTED)
FENCE, WOOD (HEIGHT NOTED)

UTILITY LINES
GAS LINE (G — G)
OVERHEAD (OH — OH)
SANITARY SEWER (SS — SS)
WATER (W — W)

PROPOSED / DESCRIPTION

PROPOSED	DESCRIPTION
◉	HDD ENTRY/EXIT LOCATION
8" W (DIP)	8" DUCTILE IRON PIPE WATER LINE
10" W (HDPE)	10" HDPE WATER LINE
⋈	GATE VALVE
⌐	WATER LINE CAP OR PLUG
◀	REDUCER
#	COUPLING

ekl environment & water
2001 JUNIPERO SERRA BOULEVARD, SUITE 300
DALY CITY, CALIFORNIA 94014
(650) 296-9100 • FAX (650) 552-9012

REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

NOTES, ABBREVIATIONS, AND LEGEND

REV	DESCRIPTION	APPRVD	DATE
1	100% DESIGN SUBMITTAL	JPNS	MAR 2021

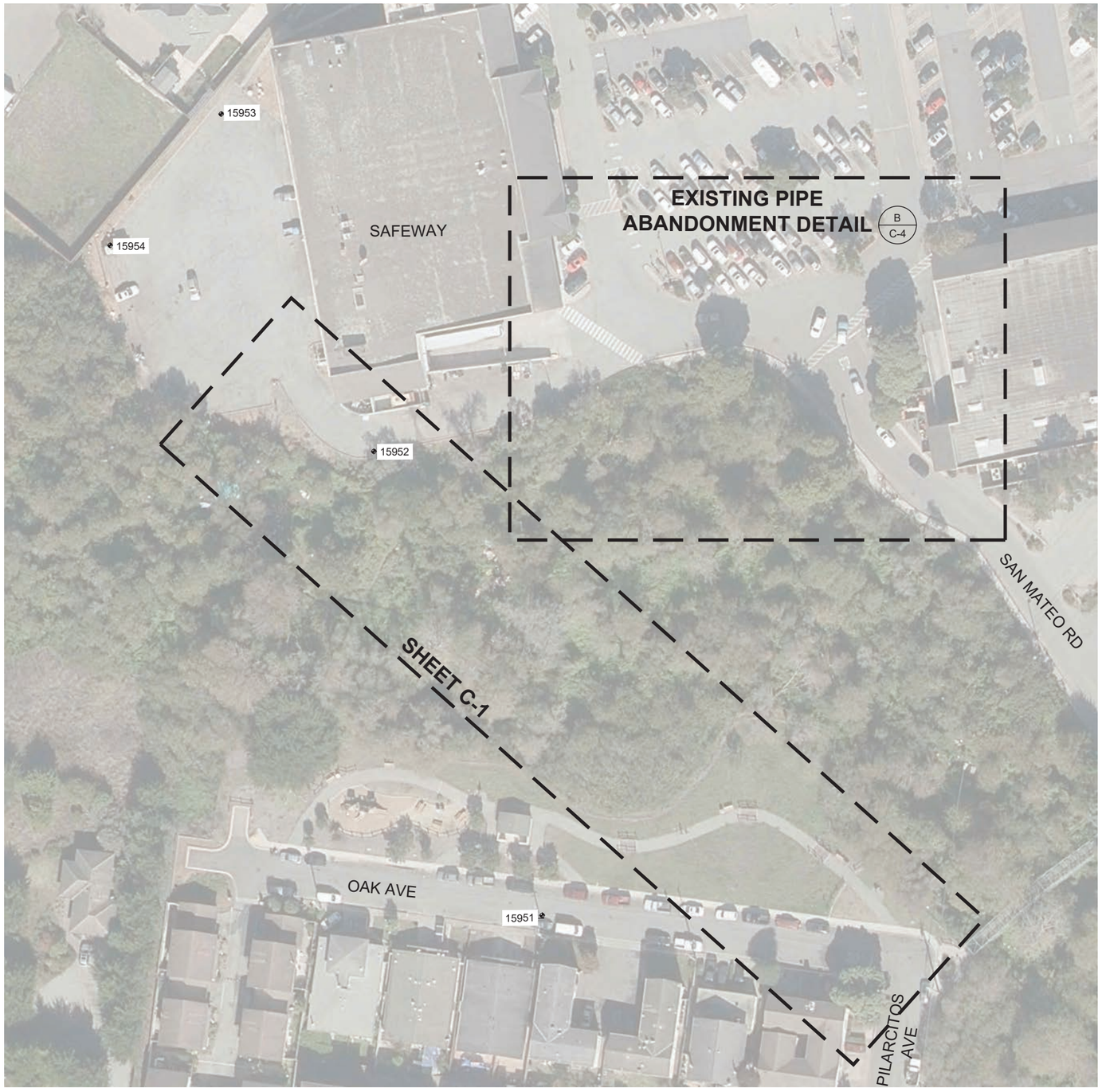
DATE: MAR 2021
SCALE: AS SHOWN
DRAWN: TCA
DESIGNED: JPNS
APPROVED: JPNS
JOB NO.: B80108.11

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY
0 1"

REGISTERED PROFESSIONAL ENGINEER
JONATHAN P. N. SUTTER
C 81606
EXP. 09/30/2021
CIVIL
STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

SHEET NUMBER
G-2
2 OF 8



KEY MAP AND CONTROL POINTS

SCALE: 1"=40'

0 20 40 80 120

SCALE: 1"=40'

SURVEY CONTROL NOTES

HORIZONTAL DATUM
NORTH AMERICAN DATUM OF 1983 (NAD83).

COORDINATE SYSTEM
COORDINATES SHOWN HEREON ARE GROUND AND BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), ZONE III.

VERTICAL DATUM
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

PROJECT BENCHMARK (NGS BM DESINATION F 1239)
BENCH MARK DISK SET IN A RETAINING WALL OR CONCRETE LEDGE OF CULVERT HEADWALL AT THE SOUTHEAST CORNER OF THE JUNCTION OF STATE HIGHWAY 1 AND KELLY AVENUE, IN THE TOP AND 0.9 FOOT NORTH OF THE SOUTH END OF THE EAST CONCRETE HEADWALL OF 24 INCH PIPE CULVERT $\frac{48}{72}$, 31 FEET EAST FO THE CENTER LINE OF THE AVENUE, 7 FEET NORTH OF STEEL LIGHT POLE "D 3036" AND ABOUT 1/2 FOOT LOWER THEN THE HIGHWAY.
ELEVATION = 62.78' (NAVD 88)

LOCAL BM
PT 15951 BEING MAG NAIL SET IN AC APPROXIMATELY 237' NORTHWEST ALONG OAK AVENUE FROM THE INTERSECTION WITH PILARCITOS AVENUE, 18' NORTH OF A POWER POLE.
ELEVATION = 40.53' (NAVD 88)

BASIS OF BEARINGS
THE BEARING BETWEEN POINTS 15951 TO 15953 BEING N 21° 49'10" W.

CONTROL POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
15951	1998663.97	5999899.24	SET GCP
15952	1998971.41	5999787.74	SET GCP
15953	1999195.00	5999686.63	SET GCP
15954	1999107.95	5999613.01	SET GCP

UTILITY NOTES

PHYSICAL ITEMS SHOWN ON THIS SURVEY ARE LIMITED TO THOSE SURFACE ITEMS VISIBLE AS OF THE DATE OF THIS SURVEY. SUBSURFACE OBJECTS, IF ANY, ARE NOT SHOWN, WITH THE EXCEPTION OF UNDERGROUND UTILITY LINES. NO WARRANTY IS IMPLIED AS TO THE EXACT LOCATION OF THESE LINES OR AS TO THE COMPLETENESS OF THE UTILITY INFORMATION SHOWN HEREON. SAID SUBSURFACE OBJECTS MAY INCLUDE, BUT ARE NOT LIMITED TO, CONCRETE FOOTINGS, SLABS, SHORING, STRUCTURAL PILES, UTILITY VAULTS, PIPING, UNDERGROUND TANKS, ADDITIONAL UNDERGROUND UTILITY LINES, TELECOMMUNICATION LINES, FIBER OPTIC LINES AND ANY OTHER SUBSURFACE STRUCTURES OR FACILITIES NOT REVEALED BY A SURFACE INSPECTION ON THE DATE THAT THE FIELD WORK FOR THIS SURVEY WAS PERFORMED. FIELD WORK WAS PERFORMED ON SEPTEMBER 26 AND OCTOBER 10, 2019.

MONUMENT NOTES

PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ON THIS SITE, IT IS ADVISED THAT ALL INVOLVED PARTIES REVIEW SECTION 8771 AND SECTION 8725 OF THE BUSINESS AND PROFESSIONS CODE AND SECTION 605 OF THE CALIFORNIA PENAL CODE TO ENSURE THAT MONUMENT CONSERVATION HAS BEEN PROPERLY ADDRESSED.

SURVEY NOTES

THE SURVEY WAS CONDUCTED BY O'DELL ENGINEERING, INC. BETWEEN SEPTEMBER AND NOVEMBER 2019.

100% SUBMITTAL/BID SET

NOT FOR CONSTRUCTION

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C 81606
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ekl environment & water
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REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

KEY MAP, CONTROL POINTS, AND SURVEY NOTES

REV	DESCRIPTION	APPRD	DATE
	100% DESIGN SUBMITTAL	JPNS	MAR 2021

DATE: MAR 2021
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DRAWN: TCA
DESIGNED: JPNS
APPROVED: JPNS
JOB NO.: B80108.11

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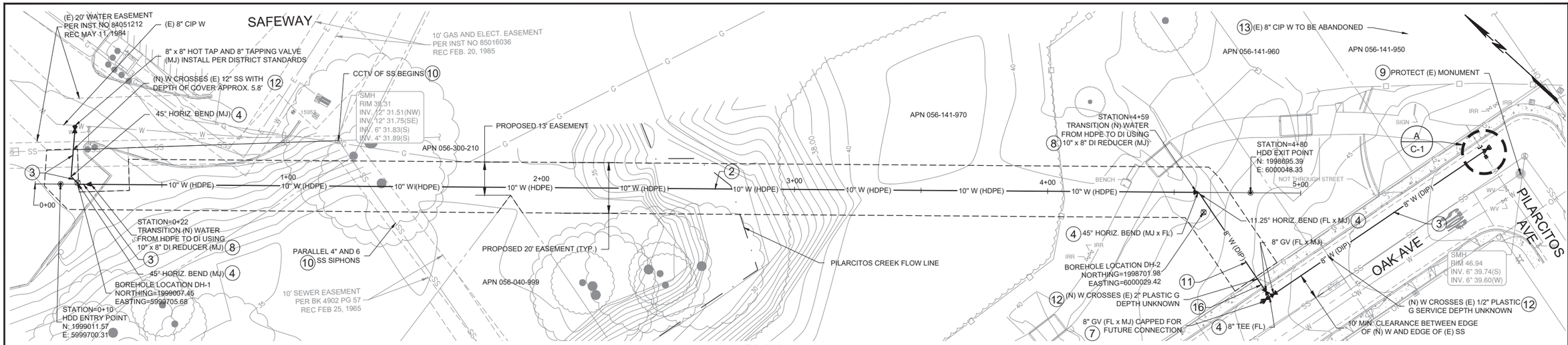
SHEET NUMBER
G-3
3 OF 8

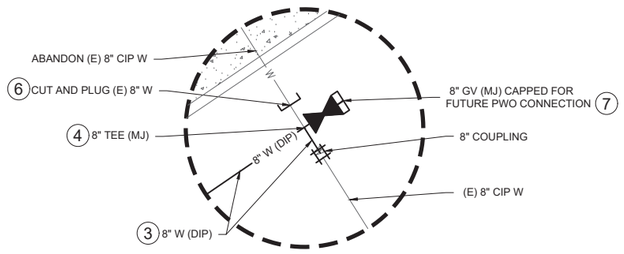


PLAN

SCALE: 1"=20'

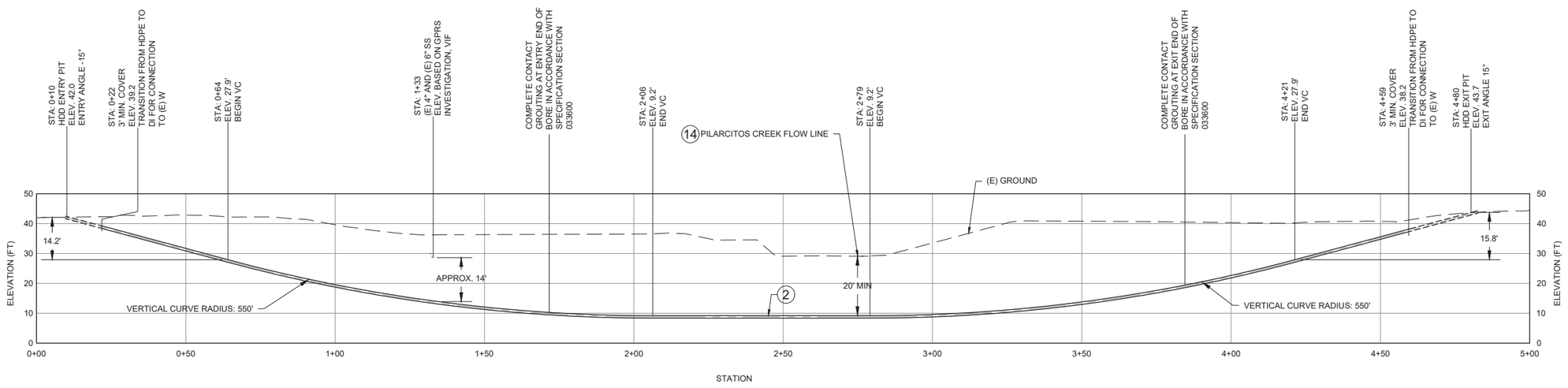
CONSTRUCTION NOTES:

1. ALL LOCATIONS AND DEPTHS OF (E) UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR POTHOLING AND VERIFYING SIZES, DEPTHS, AND LOCATIONS OF ALL UTILITIES. ANY CHANGES TO THESE PLANS AND SPECIFICATIONS SHALL BE APPROVED BY THE ENGINEER OR OWNER REPRESENTATIVE.
2. INSTALL 10" W HDPE VIA HORIZONTAL DIRECTIONAL DRILLING.
3. INSTALL (N) WATER LINE BY OPEN TRENCH PER DETAIL CC-01/C-3 FOR PAVED AREAS AND PER DETAIL CC-03/C-3 FOR UNIMPROVED AREAS.
4. INSTALL THRUST BLOCKS ON ALL FITTINGS PER DETAIL CC-22/C-3
5. INSTALL GATE VALVE PER DETAIL CC-09/C-3 WHERE REQUIRED INSTALL VALVE EXTENSION PER DETAIL CC-11/C-3.
6. CUT AND PLUG EX INACTIVE WATER LINE PER DETAIL 4/C-4 TO ABANDON (E) W IN PLACE.
7. CAP ACTIVE WATER LINE PER DETAIL 3/C-4.
8. CONTRACTOR SHALL INSTALL REDUCER ANCHOR BLOCK PER DETAIL 1/C-4.
9. PROTECT (E) MONUMENT. IF TRENCH IS LESS THAN 5' FROM EDGE OF (E) MONUMENT, CONTRACTOR SHALL NOTIFY ENGINEER AND SURVEY (E) MONUMENT. IF MONUMENT IS DAMAGED DURING CONSTRUCTION, CONTRACTOR SHALL REPLACE MONUTMENT PER CITY OF HALF MOON BAY STANDARDS AT THE CONTRACTOR'S EXPENSE.
10. PRIOR TO AND AFTER HDD INSTALLATION, CONTRACTOR SHALL CONDUCT CCTV INSPECTIONS OF THE (E) 4" AND 6" SS SIPHONS PER SPECIFICATION SECTION 02732. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING DAMAGE TO THE SS SIPHONS CAUSED BY HDD OPERATIONS AT THE CONTRACTORS EXPENSE.
11. RETAIN EXISTING VEGETATION AS PRACTICABLE. TURF AREA DISTURBED BY TRENCH OR CONSTRUCTION ACTIVITIES SHALL BE REPLACED PER SPECIFICATION SECTION 02900. CONTRACTOR SHALL COORDINATE TURF AND SPRINKLER REPAIR WITH CITY PUBLIC WORKS STAFF AND THAT THE CONTRACTOR IS RESPONSIBLE FOR ANY REPAIRS TO CITY SPRINKLERS AND TURF AREAS.
12. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES THAT CROSS THE (N) W ALIGNMENT AND PROVIDE POTHOLE DATA TO THE DISTRICT PRIOR TO CONSTRUCTION.
13. FOR ABANDONMENT OF THE (E) W ON THE NORTHERN SIDE SEE DETAIL B/C-4.
14. CONTRACTOR SHALL CONFIRM THALWEG OF CREEK ALONG HDD ALIGNMENT PRIOR TO BEGINNING CONSTRUCTION. IF THALWEG IS DIFFERENT THAN SHOWN ON PLANS CONTRACTOR SHALL INFORM ENGINEER.
16. SIDEWALK, CURB AND GUTTER SHALL BE RESTORED PER CITY OF HALF MOON BAY STANDARD DETAIL SI-3/C-3.



PILARCITOS AVE CONNECTION DETAIL A

NOT TO SCALE



PROFILE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'

100% SUBMITTAL/BID SET

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REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

PLAN AND PROFILE

DATE	DESCRIPTION	APPRD
MAR 2021	100% DESIGN SUBMITTAL	JPNS

DATE: MAR 2021
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APPROVED: JPNS
JOB NO.: B80108.11

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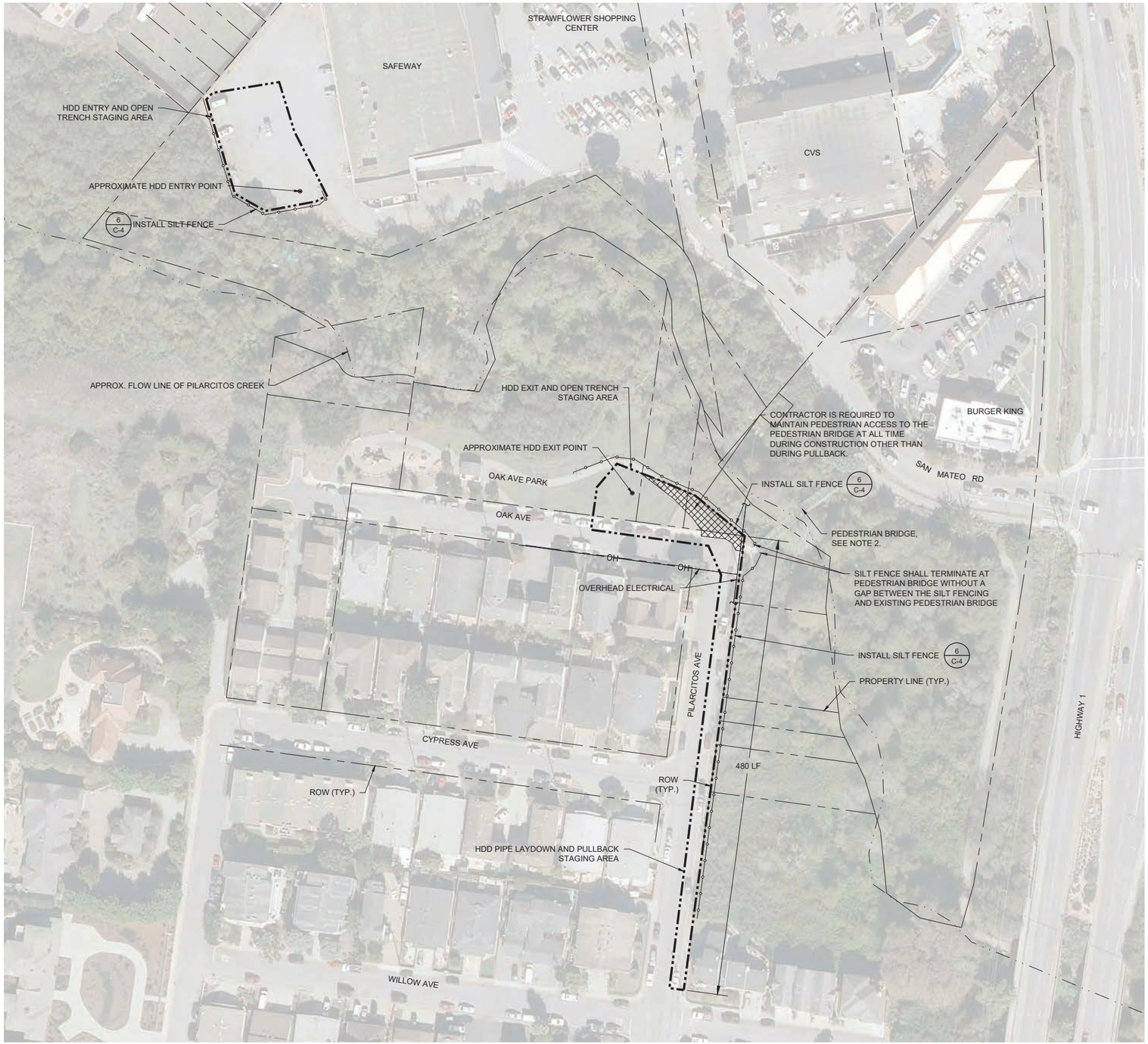
SHEET NUMBER
C-1
4 OF 8

REGISTERED PROFESSIONAL ENGINEER
JONATHAN P. N. SUTTER
C 81606
EXP. 09/30/2021
CIVIL
STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

Path: \\eklconsult.com\go\cad\EKL_CONSTRUCTION DWGS\B80108.01 (CIP PROJECTS)\B80108.11 Filename: B80108.11 - C-1.dwg Plot Date: March 30, 2021 - 10:40 AM CADD User: Taylor Allen



PLAN

0 30 60 120 180

SCALE: 1"=60'

LEGEND:

- ROW /PROPERTY LINE
- OH — OVERHEAD ELECTRICAL
- SILT FENCE
- APPROX. FLOW LINE OF PILARCITOS CREEK
- STAGING AREA

NOTES:

1. ALL HDD CONSTRUCTION MATERIALS AND EQUIPMENT SHALL ONLY BE STORED IN DESIGNATED STAGING AREAS SHOWN ON THIS PLAN UNLESS OTHERWISE ARRANGED BY THE CONTRACTOR. ENGINEER TO DELINEATE STAGING AREAS IN FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ENCLOSURE FENCING AROUND THE HDD STAGING AREAS IN ACCORDANCE WITH SPECIFICATION SECTION 01410 TO PREVENT ENTRY OF UNAUTHORIZED PERSONS.
2. SAFE VEHICULAR AND PEDESTRIAN ACCESS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION. AT LEAST ONE LANE OF TRAFFIC ALONG OAK AVE AND PILARCITOS AVE MUST BE MAINTAINED AT ALL TIMES. ACCESS TO THE PEDESTRIAN BRIDGE MUST BE MAINTAINED AT ALL TIMES OTHER THAN DURING THE HDD PIPE PULLBACK.
3. ALL HDD PIPE FABRICATION SHALL BE COMPLETED WITHIN THE ALLOWABLE PIPE LAYDOWN AREA ON PILARCITOS AVENUE, AS SHOWN ON THE PLANS.
4. ALL OPEN TRENCH CONSTRUCTION MATERIALS AND EQUIPMENT SHALL ONLY BE STORED IN THE DESIGNATED STAGING AREA SHOWN AT THE END OF EACH WORK DAY THROUGHOUT THE DURATION OF THE OPEN TRENCH INSTALLATION.
5. AT NO TIME MAY THE CONTRACTORS OPERATIONS IMPEDE WITH THE STRAWFLOWER SHOPPING CENTER'S OPERATIONS.
6. THE CONTRACTOR SHALL INSTALL BARRIERS OR FENCING AS NEEDED TO KEEP THE PUBLIC OUT OF OAK AVENUE PARK WORK AREA AND MAINTAIN SAFE ACCESS TO THE PEDESTRIAN WALKWAYS AND BRIDGE AT ALL TIMES OTHER THAN DURING THE HDD PIPE PULLBACK.

100% SUBMITTAL/BID SET

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REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

CONSTRUCTION STAGING AREAS

	DATE	DESCRIPTION	APPRD
	MAR 2021	100% DESIGN SUBMITTAL	JPNS

DATE: MAR 2021
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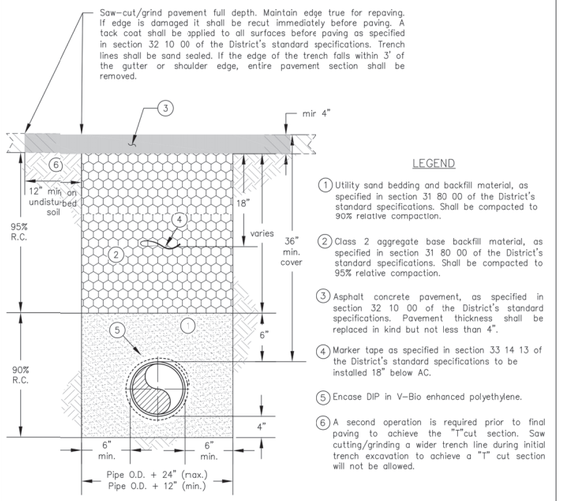
C 81606
EXP. 09/30/2021
CIVIL
STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

SHEET NUMBER
C-2
5 OF 8



LEGEND

1. Utility sand bedding and backfill material, as specified in section 31 80 00 of the District's standard specifications. Shall be compacted to 90% relative compaction.
2. Class 2 aggregate base backfill material, as specified in section 31 80 00 of the District's standard specifications. Shall be compacted to 95% relative compaction.
3. Asphalt concrete pavement, as specified in section 32 10 00 of the District's standard specifications. Pavement thickness shall be replaced in kind but not less than 4".
4. Marker tape as specified in section 33 14 13 of the District's standard specifications to be installed 18" below AC.
5. Encase DIP in V-Bio enhanced polyethylene.
6. A second operation is required prior to final paving to achieve the "T"cut section. Saw cutting/grinding a wider trench line during initial trench excavation to achieve a "T" cut section will not be allowed.

Note:
Replace existing tracer wire if damaged during trenching operation.

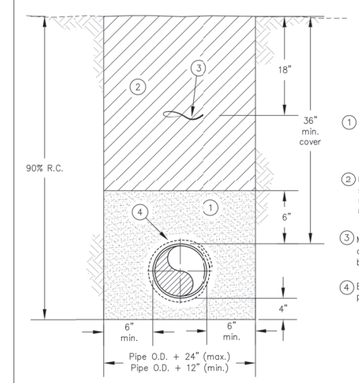
TRENCH SECTION - TYPE A PAVED SURFACES

REV. 05/2018

COASTSIDE COUNTY WATER DISTRICT
766 MAIN STREET
HALF MOON BAY, CA

Approved by:
David Dickson, General Manager

STD. NO. CC-01



LEGEND

1. Utility sand bedding and backfill material, as specified in section 31 80 00 of the District's standard specifications. Shall be compacted to 90% relative compaction.
2. Native backfill material, as specified in section 31 80 00 of the District's standard specifications. Shall be compacted to 95% relative compaction.
3. Marker tape as specified in section 33 14 13 of the District's standard specifications to be installed 18" below AC.
4. Encase DIP with V-Bio enhanced polyethylene.

Note:
Replace existing tracer wire if damaged during trenching operation.

TRENCH SECTION - TYPE C UNIMPROVED AREA

REV. 05/2018

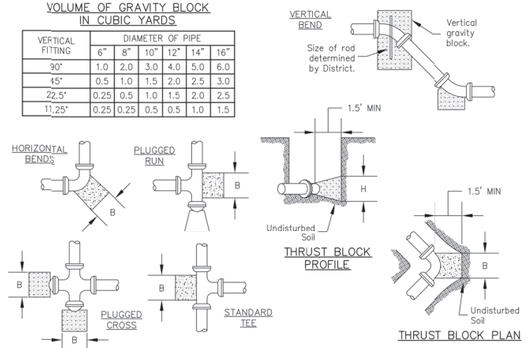
COASTSIDE COUNTY WATER DISTRICT
766 MAIN STREET
HALF MOON BAY, CA

Approved by:
David Dickson, General Manager

STD. NO. CC-03

VOLUME OF GRAVITY BLOCK IN CUBIC YARDS

VERTICAL FITTING	DIAMETER OF PIPE					
	6"	8"	10"	12"	14"	16"
90°	1.0	2.0	3.0	4.0	5.0	6.0
45°	0.5	1.0	1.5	2.0	2.5	3.0
22.5°	0.25	0.5	1.0	1.5	2.0	2.5
11.25°	0.25	0.25	0.5	0.5	1.0	1.5



DIMENSIONS OF THRUST BLOCKS IN FEET

HORIZONTAL FITTING	DIAMETER OF PIPE											
	6"		8"		10"		12"		14"		16"	
	B	H	B	H	B	H	B	H	B	H	B	H
90°	1'-9"	1'-9"	2'-3"	2'-3"	2'-9"	2'-9"	3'-3"	3'-3"	3'-9"	3'-9"	4'-3"	4'-3"
45°	1'-0"	1'-0"	1'-6"	1'-6"	2'-0"	2'-0"	2'-6"	2'-6"	3'-0"	3'-0"	3'-6"	3'-6"
22.5°	1'-0"	0'-6"	1'-0"	0'-8"	1'-6"	0'-8"	1'-6"	1'-0"	1'-6"	1'-6"	2'-0"	1'-6"
11.25°	1'-0"	0'-6"	1'-0"	0'-6"	1'-0"	0'-6"	1'-0"	0'-8"	1'-8"	0'-8"	1'-5"	1'-0"
PLUG/TEE	1'-3"	1'-3"	1'-9"	1'-9"	2'-3"	2'-3"	2'-9"	2'-9"	3'-3"	3'-3"	3'-9"	3'-9"

NOTES:
1. Use 2,000 psi high early strength concrete.
2. All thrust blocks and gravity blocks shall bear against undisturbed earth.
3. Encased DI pipe in 8 mil. linear low-density polyethylene film.
4. Maintain a minimum clearance of 2" between the thrust block reinforcing steel and pipe.
5. Concrete not to extend beyond the face of the bell.
6. Thrust block shall encompass at least one-half of the outside diameter of the pipe.
7. Flanges, bolts, and nuts shall be kept clear of concrete.
8. Dimensions above include use of mechanical restraints on pipe.
9. If groundwater is presented, thrust block dimensions shall be determined by the District.
10. Thrust block dimensions shall be doubled if used on non-restrained connections.

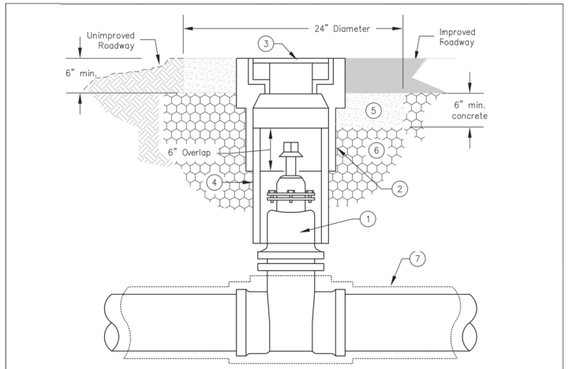
THRUST RESTRAINT - THRUST BLOCK DETAILS

REV. 05/2018

COASTSIDE COUNTY WATER DISTRICT
766 MAIN STREET
HALF MOON BAY, CA

Approved by:
David Dickson, General Manager

STD. NO. CC-22



LEGEND

1. Gate valve, Mueller No. A-2362 with Type 316 SS bolts and nuts, and 2" square bronze operation nut. Steam seal shall be O-ring type. Valve stem shall be made of ASTM B98-C66100/H02 (Everdur) bar stock mcterial; EPDM rubber; machined release groove below operating nut; and stuffing box aligned with the direction of the pipe. If coating on gate valve is damaged during the installation, it should be repaired using Mueller Epoxy Kit No. 280089 to the satisfaction of the District. Valve shall be set plumb.
2. Traffic valve box, Christy Concrete No. G05TBOX.
3. Cast iron traffic cover inscribed "WATER", Christy Concrete No. G05CT.
4. SDR 35 PVC pipe riser - 8" minimum diameter.
5. 2,000 psi high early strength. Asphalt shall be placed on top of concrete collar, same day.
6. Backfill material, aggregate base per road surface, see Detail CC-01.
7. Encase DIP in V-Bio enhanced polyethylene. Wrap excess film with 10-mil pipe tape.

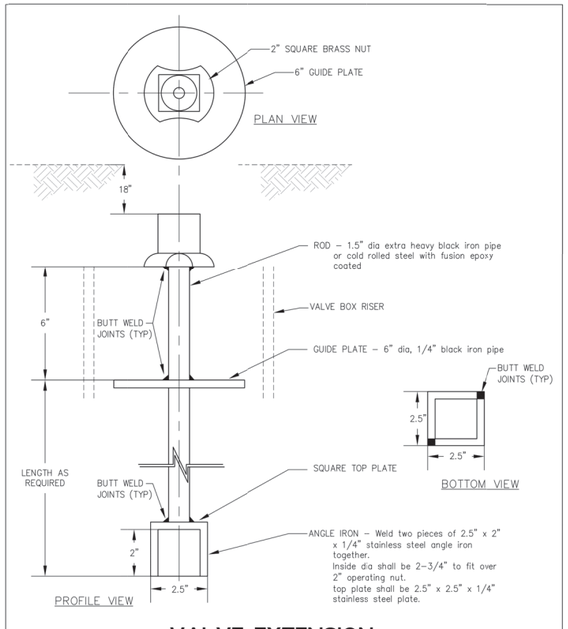
GATE VALVE ASSEMBLY

REV. 05/2018

COASTSIDE COUNTY WATER DISTRICT
766 MAIN STREET
HALF MOON BAY, CA

Approved by:
David Dickson, General Manager

STD. NO. CC-09



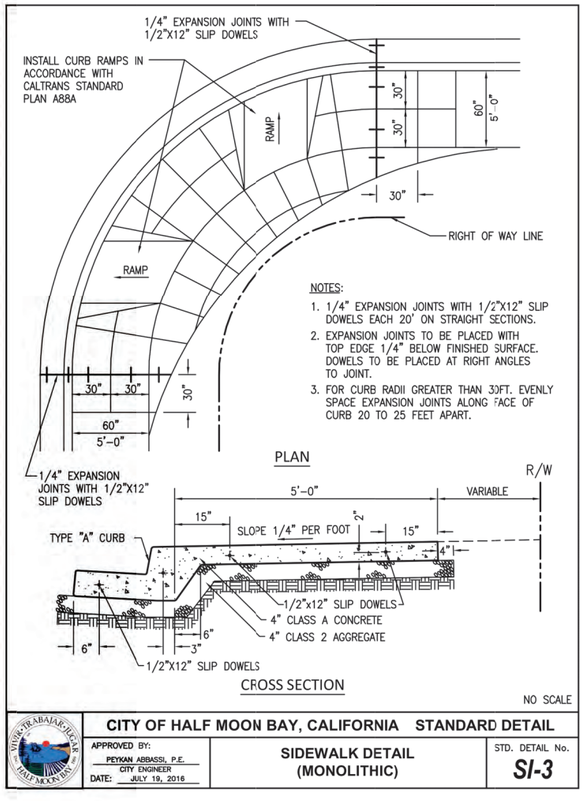
VALVE EXTENSION

REV. 05/2018

COASTSIDE COUNTY WATER DISTRICT
766 MAIN STREET
HALF MOON BAY, CA

Approved by:
David Dickson, General Manager

STD. NO. CC- 11



NOTES:
1. 1/4" EXPANSION JOINTS WITH 1/2"X12" SLIP DOWELS EACH 20' ON STRAIGHT SECTIONS.
2. EXPANSION JOINTS TO BE PLACED WITH TOP EDGE 1/4" BELOW FINISHED SURFACE. DOWELS TO BE PLACED AT RIGHT ANGLES TO JOINT.
3. FOR CURB RADII GREATER THAN 30FT. EVENLY SPACE EXPANSION JOINTS ALONG FACE OF CURB 20 TO 25 FEET APART.

NO SCALE

CITY OF HALF MOON BAY, CALIFORNIA STANDARD DETAIL

APPROVED BY: PEYKAN ABBASSI, P.E., CITY ENGINEER
DATE: JULY 19, 2016

SIDEWALK DETAIL (MONOLITHIC)

STD. DETAIL No. SI-3

100% SUBMITTAL/BID SET
NOT FOR CONSTRUCTION

ekl environment & water
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REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

CONSTRUCTION DETAILS 1

DESCRIPTION	REV	APPRD	DATE
100% DESIGN SUBMITTAL		JPNS	MAR 2021

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C 81606
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SHEET NUMBER
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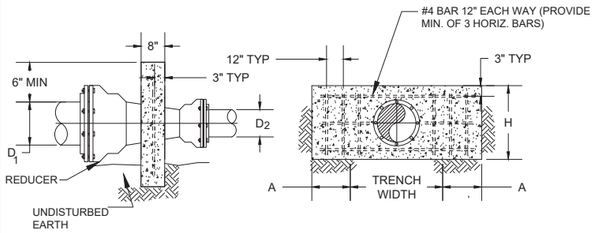
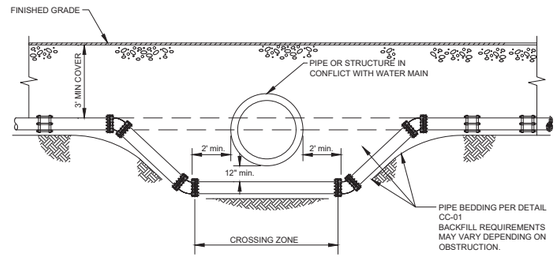
6 OF 8



ANCHOR BLOCK FOR REDUCERS

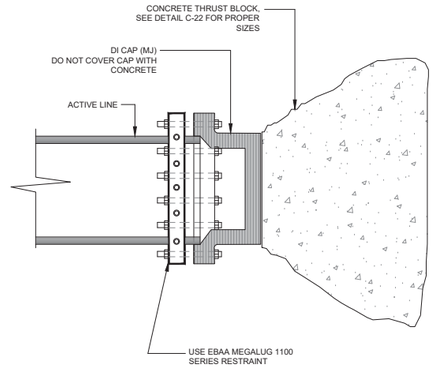
REDUCER SIZE D_1 X D_2	H (FT.)	A (FT.)
20" X 16"	3.0	3.5
16" X 12"	2.5	3.0
16" X 10"	3.0	3.5
16" X 8"	4.0	3.5
16" X 6"	4.5	3.5
12" X 10"	1.5	2.0
12" X 8"	2.0	2.5
12" X 6"	2.0	3.5
10" X 8"	1.5	2.0
8" X 6"	1.0	2.0
8" X 4"	1.0	3.0
6" X 4"	1.0	1.5

REDUCER ANCHOR BLOCK 1
NTS

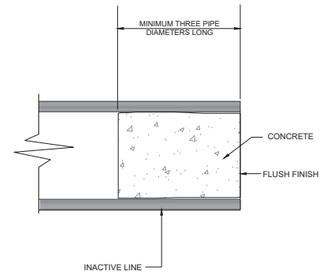


NOTES:
1. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS, AS REQUIRED FOR PROPER HORIZONTAL SEPARATION.
2. ALL MECHANICAL JOINTS SHALL BE PROVIDED WITH APPROVED JOINT RESTRAINT DEVICES, "MEGALUGS" BY EBBA, OR EQUAL.
3. THRUST BLOCKS ARE REQUIRED AT ALL BENDS, TEES AND VALVES IN ACCORDANCE WITH STANDARD DETAIL CC-22
4. NEW WATER MAINS SHALL NOT BE INSTALLED IN THE SAME TRENCH AS, AND SHALL BE AT LEAST 10 FT. HORIZONTALLY FROM AND ONE FOOT VERTICALLY ABOVE, ANY PARALLEL SANITARY SEWER LINE. WATER MAIN SHALL BE ENCAPSOLATED WITH CONCRETE OR CDF IF CROSSING UNDER SANITARY SEWER LINE.
5. NEW WATER MAINS SHALL BE INSTALLED AT LEAST 4 FEET HORIZONTALLY FROM, AND ONE FOOT VERTICALLY ABOVE, ANY PARALLEL STORM DRAINAGE PIPELINE. WATER MAIN SHALL BE ENCAPSOLATED WITH CONCRETE OR CDF IF CROSSING UNDER STORM DRAINAGE PIPELINE.
6. IF CROSSING A SANITARY OR STORM DRAINAGE PIPELINE, A NEW WATER MAIN SHALL BE CONSTRUCTED NO LESS THAN 45 DEGREES TO AND AT LEAST ONE FOOT ABOVE THAT PIPELINE. NO CONNECTION JOINTS SHALL BE MADE IN THE WATER MAIN WITHIN EIGHT HORIZONTAL FEET OF THE SANITARY OR STORM DRAINAGE PIPELINE.
7. NEW WATER MAINS SHALL NOT BE INSTALLED WITHIN 100 HORIZONTAL FEET OF THE NEAREST EDGE OF ANY SANITARY LANDFILL, WASTEWATER DISPOSAL POND, OR HAZARDOUS WASTE DISPOSAL SITE, OR WITHIN 25 FEET OF THE NEAREST EDGE OF ANY CESSPOOL, SEPTIC TANK, SEWAGE LEACH FIELD, SEEPAGE PIT, UNDERGROUND HAZARDOUS MATERIALS.

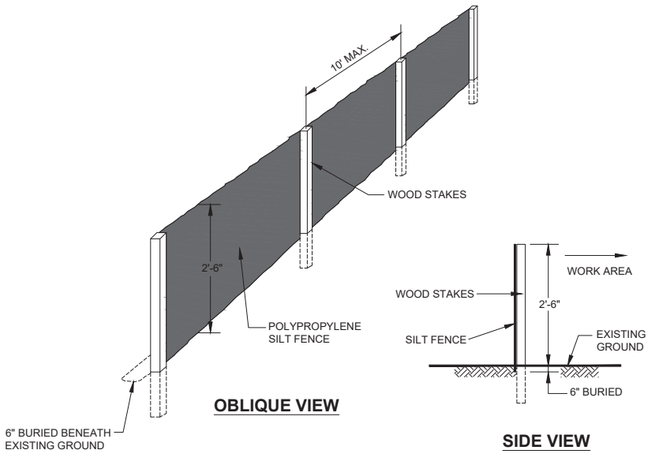
UTILITY CROSSING 5
NTS



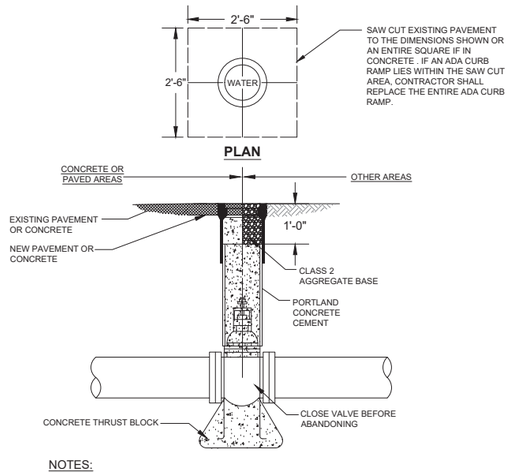
CAP ACTIVE LINE 3
NTS



PLUG INACTIVE LINE 4
NTS

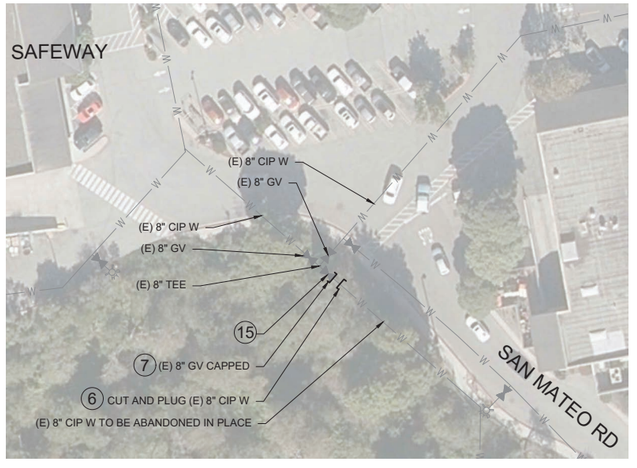


TEMPORARY SILT FENCE 5
NTS



NOTES:
1. REMOVE VALVE BOX AND LID.
2. FILL RISER WITH PORTLAND CEMENT CONCRETE TO 12" BELOW GRADE FOR UNIMPROVED AREAS, TO THE BOTTOM OF EXISTING PAVEMENT FOR PAVED AREAS, AND TO THE SURFACE FOR CONCRETE AREAS.
3. REPAIR SURFACE IN KIND FOR PAVED OR CONCRETE AREAS. REPLACE TOPSOIL IN UNPAVED AREAS.

VALVE ABANDONMENT 6
NTS



SAN MATEO RD WATER LINE ABANDONMENT B
SCALE: 1"=40'

CONSTRUCTION NOTES:
6 CUT AND PLUG EX INACTIVE WATER LINE PER DETAIL 4/C-4 TO ABANDON (E) W IN PLACE.

7 CAP ACTIVE WATER LINE PER DETAIL 3/C-4

15 ABANDON (E) W VALVE PER DETAIL 6/C-4.

NOTE: SEE KEY MAP ON SHEET G-3 FOR LOCATION.

100% SUBMITTAL/BID SET

NOT FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER JONATHAN P. N. SUTTER C 81606 EXP. 09/30/2021 CIVIL STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

ekl environment & water
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DALY CITY, CALIFORNIA 94014
(650) 292-9100 • FAX (650) 552-9012

REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

CONSTRUCTION DETAILS 2

	DATE	DESCRIPTION	APPRD
1	MAR 2021	100% DESIGN SUBMITTAL	JPNS

DATE: MAR 2021
SCALE: AS SHOWN
DRAWN: TCA
DESIGNED: JPNS
APPROVED: JPNS
JOB NO.: B80108.11

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

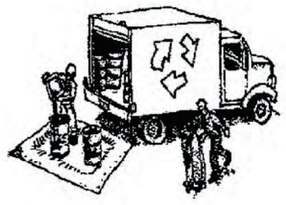
SHEET NUMBER
C-4
7 OF 8

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Construction Best Management Practices (BMPs)

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

Hazardous Materials

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.

Construction Entrances and Perimeter

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

Equipment Management & Spill Control

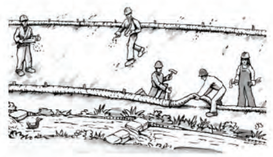
Maintenance and Parking

- ❑ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Earthmoving



- ❑ Schedule grading and excavation work during dry weather.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Remove existing vegetation only when absolutely necessary, and seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.
- ❑ Prevent sediment from migrating offsite and protect storm drain inlets, gutters, ditches, and drainage courses by installing and maintaining appropriate BMPs, such as fiber rolls, silt fences, sediment basins, gravel bags, berms, etc.
- ❑ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

Contaminated Soils

- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells
  - Buried barrels, debris, or trash.

Paving/Asphalt Work

- ❑ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

Sawcutting & Asphalt/Concrete Removal

- ❑ Protect nearby storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, absorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

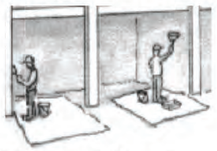
Concrete, Grout & Mortar Application

- ❑ Store concrete, grout, and mortar away from storm drains or waterways, and on pallets under cover to protect them from rain, runoff, and wind.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and in a manner that will prevent leaching into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ When washing exposed aggregate, prevent washwater from entering storm drains. Block any inlets and vacuum gutters, hose washwater onto dirt areas, or drain onto a bermed surface to be pumped and disposed of properly.

Landscaping

- ❑ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ❑ Stack bagged material on pallets and under cover.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

Painting & Paint Removal



Painting Cleanup and Removal

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

Dewatering

- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

Storm drain polluters may be liable for fines of up to $10,000 per day!

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eki environment & water
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(650) 292-9100 • FAX (650) 552-9012

REPLACEMENT OF 8-INCH PIPELINE UNDER CREEK AT PILARCITOS AVENUE (STRAWFLOWER)
COASTSIDE COUNTY WATER DISTRICT

CONSTRUCTION BEST MANAGMENT PRACTICES

	100% DESIGN SUBMITTAL	JPNS	MAR 2021
REV	DESCRIPTION	APPRD	DATE

DATE: MAR 2021
SCALE: AS SHOWN
DRAWN: TCA
DESIGNED: JPNS
APPROVED: JPNS
JOB NO.: B80108.11

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY
0 1"

REGISTERED PROFESSIONAL ENGINEER
JONATHAN P. N. SUTTER
C 81606
EXP. 09/30/2021
CIVIL
STATE OF CALIFORNIA

100% DESIGN SUBMITTAL

SHEET NUMBER
C-5
8 OF 8

APPENDIX F – PRELIMINARY DESIGN REPORT

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Preliminary Design Report

Coastside County Water District

Replacement of 8-Inch Pipeline Under Pilarcitos Creek at Pilarcitos Avenue (Strawflower) Project, Half Moon Bay, CA

FINAL
27 April 2020
EKI B80108.08

EKI ENVIRONMENT & WATER, INC.

www.ekiconsult.com
577 Airport Blvd, Suite 500 • Burlingame, CA 94010

Preliminary Design Report

Replacement of 8-Inch Pipeline Under Pilarcitos Creek at Pilarcitos Avenue (Strawflower) Project

Coastside County Water District

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LIST OF ABBREVIATIONS

AACE	Association for the Advancement of Cost Engineering
APN	Assessor's Parcel Number
AWWA	American Water Works Association
bgs	below ground surface
CCWD or District	Coastside County Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City	City of Half Moon Bay
Creek	Pilarcitos Creek
DIP	ductile iron pipe
DR	Dimension Ratio
EA	each
EKI	EKI Environment & Water, Inc.
FPVC	fusible polyvinylchloride
ft	feet
GLA	Geo-Logic Associates
HDD	horizontal directional drilling
HDPE	high-density polyethylene
in	inch
IPS	Iron Pipe Size
IS/MND	Initial Study/Mitigated Negative Declaration
LF	linear feet
LSAA	1602 Lake and Streambed Alteration Agreement
NAVD88	North American Vertical Datum of 1988
OPC	opinion of probable construction cost
pcf	pounds per cubic feet
PDR	Preliminary Design Report
PE	Polyethylene
PG&E	Pacific Gas and Electric Company
P_{max}	maximum allowable drilling fluid pressure that the soil can withstand before hydrofracture occurs
P_{min}	minimum required pressure to return the soil cuttings back to the surface
psf	pounds per square foot
psi	pounds per square inch
R_{pmax}	radius of plastic zone
SF	square feet
SSMH	Sanitary Sewer Manhole
V_a	volume of the annulus
V_s	settlement trough volume

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1. INTRODUCTION

EKI Environment & Water, Inc. (EKI) is providing engineering design services to the Coastside County Water District (CCWD or District) for the Replacement of the 8-Inch Pipeline Under Pilarcitos Creek at Pilarcitos Avenue (Strawflower) Project (Project) located in Half Moon Bay, California (Figure 1). EKI has prepared this Preliminary Design Report (PDR) for CCWD to evaluate the feasibility of installing the new pipeline under Pilarcitos Creek via horizontal directional drilling (HDD) construction methods.

1.1. Project Background

The existing 8-inch pipeline crossing Pilarcitos Creek (creek) between the intersection of Pilarcitos Avenue and Oak Avenue south of the creek and the Strawflower Village Shopping Center north of the creek is one of only two pipelines supplying water to areas of the District south of Pilarcitos Creek, including downtown Half Moon Bay. The pipe's age, current condition, and exact location in the creek are unknown. A break occurring in the section of pipe underneath the creek bed would be difficult to detect and could cause significant water loss, serious water quality issues, and environmental damage with potential fines. The District completed an initial phase of work in June 2017 that consisted of installing approximately 400 feet of 8-inch pipe within the Strawflower access road from Highway 92 that ensures water supply to commercial customers in the event of a problem with the existing pipe under the creek.

In 2016, the District prepared a preliminary design to replace the section of pipe under the creek with a new pipeline running over the creek, attached to the existing pedestrian bridge, which is owned and maintained by the City of Half Moon Bay (City). Based on recent discussions between the District and the City, the District is concerned that it will be difficult for both parties to agree on terms for operations and maintenance of the bridge and pipeline that will be in the District's best interests. Consequently, the District decided to evaluate replacing the existing pipeline with a new pipe that crosses under the creek, installed via HDD. This trenchless construction method would also reduce impacts to the creek, which is known to be habitat for endangered steelhead. Figure 1 shows an aerial view of the project site and the preliminary crossing location.

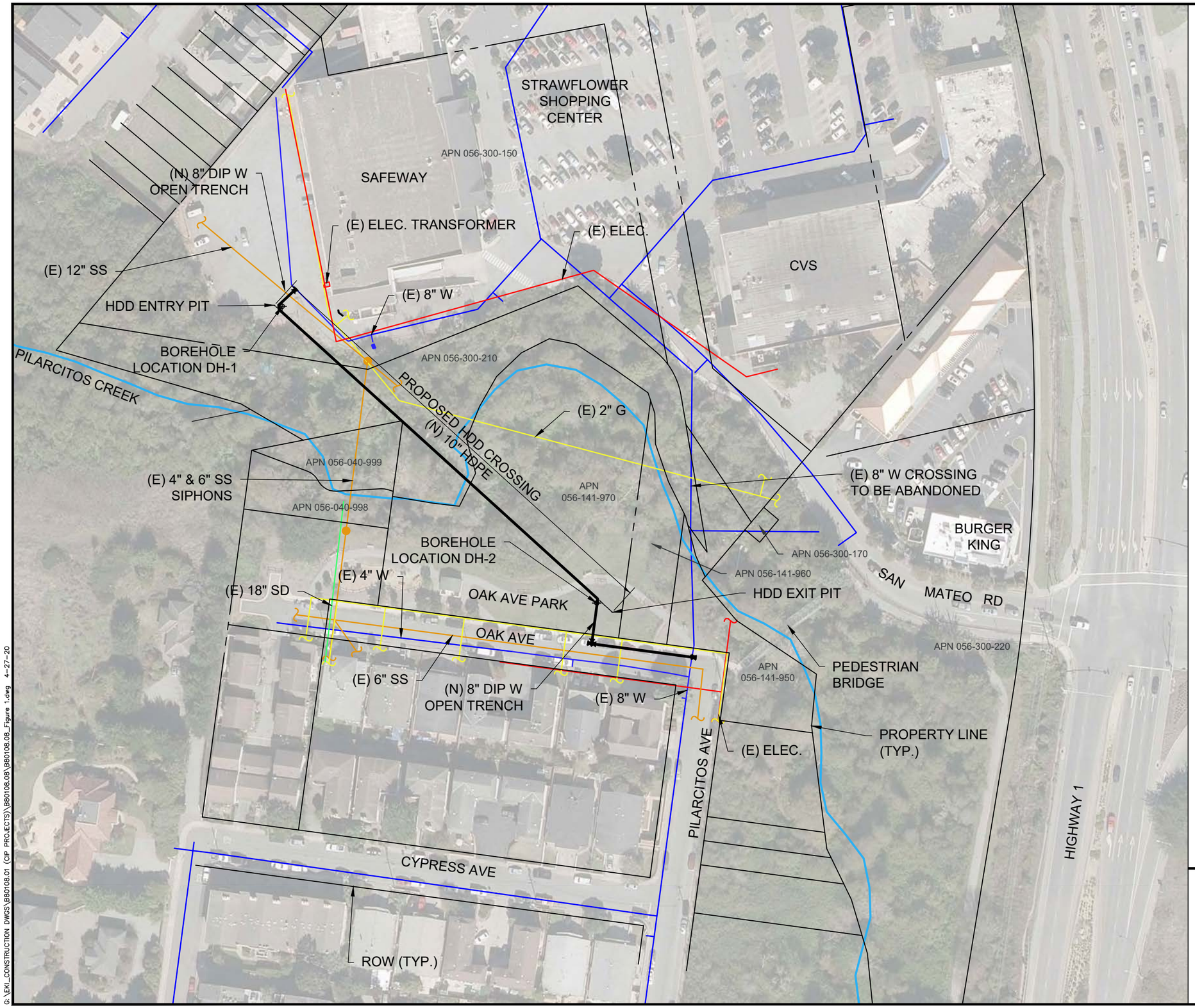
1.2. PDR Objectives and Scope

The main objectives of this PDR are to develop the preliminary design and construction approach for the new pipeline under Pilarcitos Creek. The scope of the preliminary design for the Project includes:

- Analysis of site conditions including potential utility conflicts;
- Identification of existing property boundaries and easements in the vicinity of the Project;
- Analysis of geotechnical conditions;
- Development of a preliminary pipeline alignment;

- Selection of pipe material and size;
- Calculations to confirm that the pipe can resist pullback forces during installation;
- Calculations to estimate the risk of hydrofracture;
- Calculations to estimate potential settlement at sensitive locations;
- Development of preliminary construction laydown and work areas;
- Review of permitting and easement requirements;
- Preparation of preliminary design drawings; and
- Preparation of a preliminary opinion of probable construction costs (OPC) and total project costs.

This PDR provides the basis for future detailed design and permitting efforts.



Legend:

- ROW/Property Line
- Existing Water Line
- Existing Storm Drain
- Existing Gas
- Existing Sanitary Sewer
- Existing Electrical
- Proposed Water Line
- Approximate Creek Flow Line

Abbreviations:

APN	Assessor's parcel number
(E)	Existing
ELEC.	Electrical
G	Gas
(N)	New
ROW	Right-of-Way
SD	Storm Drain
SS	Sanitary Sewer
TYP.	Typical
W	Water

Notes:

1. All locations are approximate.

N

0 100 200

(Scale in Feet)

Project Site Plan

Coastside County Water District
Half Moon Bay, CA
April 2020
EKI B80108.08

Figure 1

G:\EKI_CONSTRUCTION DWGS\B80108.01 (CIP PROJECTS)\B80108.08\B80108.08_Figure 1.dwg 4-27-20

2. HORIZONTAL DIRECTIONAL DRILLING (HDD) CONSTRUCTION METHOD

HDD is a trenchless construction method whereby a pipe is installed along an arcing drill path, beginning and ending at the ground surface and typically passing under a conflicting feature. HDD can be used in most soil conditions including areas with high groundwater and is often used to cross rivers or other waterbodies. HDD installations may encounter difficulties in soils with cobbles and boulders.

HDD is typically a three-phase process. The first phase involves setting up a drill rig on one side of the crossing and drilling a pilot hole from a small entry pit in front of the rig. The entry pit contains drilling fluids. The bore begins with a vertically angled straight tangent section to quickly gain depth. Then the bore is steered in a vertical curved path into a horizontal section before following an upward curved path and straight tangent section to the exit point. Another small pit is typically excavated at the exit point to contain fluids and facilitate the reaming and pullback operations.

Figure 2 – HDD drill rig installing pilot bore [Left]; Pilot bore drill bit at exit pit [Right]

The second phase involves enlarging the pilot hole using reaming equipment to the diameter required for pullback of the pre-fabricated product pipe, typically 1.5 times the pipe diameter. The final borehole must be larger than the product pipe to reduce frictional pullback forces on the pipe by allowing for the flow of drilling fluids around the pipe. A reamer tool replaces the drill bit on the drill pipe and is rotated and pulled back by the HDD machine to expand the pilot hole. One or more reaming passes may be required depending on the product pipe size.


Figure 4 – Example reaming equipment

After reaming, the third phase involves pulling back the pre-fabricated product pipe through the enlarged hole from the exit point back to the drill rig at the entry pit. The product pipe is typically fully assembled before pullback while the bore is completed. Pullback is typically completed without interruption to reduce the risk of the bore collapsing.


Figure 3 – Example of pre-fabricated product pipe string [Left]; Pullback of product pipe [Right]

Drilling mud, typically a mixture of water and bentonite or polymer, is used to remove the soil cuttings, support the walls of the borehole, and cool the cutting tools. Mixing systems are used to mix the drilling fluid additives with water to achieve the fluid properties appropriate for the site-specific geology. Separation plants are used to remove soil cuttings and recycle drilling fluids.

Because no shafts or casing pipes are required, HDD installations often minimize impacts to nearby residents and businesses, have shorter construction durations, and are less expensive

than other types of trenchless construction. However, the surface-launched nature of HDD typically requires a longer overall crossing length and a long, narrow work area on one side of the crossing to fabricate the pipe string.

During HDD installations, there is the potential for hydrofracture – when drilling fluids inadvertently escape from the borehole and migrates to the ground surface. Hydrofracture or frac-out conditions occur when pressures in the drilling fluids build up within the borehole until they exceed the strength of the surrounding soils. Hydrofracture can lead to the discharge of drilling fluids and is a serious concern when crossing sensitive areas such as waterways.

3. SITE CONDITIONS

This section describes the site's surface conditions, existing utilities, and geotechnical conditions. These discussions are based on field visits, available utility maps, topographic and boundary surveying completed by O'Dell Engineering between September and November 2019, geotechnical investigations completed by Geo-Logic Associates (GLA) between September and November 2019, and ground-penetrating radar (GPR) services performed by Presidio Systems Inc. (PSI) in March 2020. The topographic and boundary survey base maps are included in Appendix A, and the geotechnical report is included in full in Appendix B. As-built records were not available for the existing 8-inch water main or other utilities.

3.1. Surface Conditions and Existing Utilities

The north end of the proposed creek crossing is on private property in the paved parking lot behind Safeway in the Strawflower Village shopping center. This parking lot is not heavily used due to its location behind the store. The parking lot is accessible from the east directly from San Mateo Road through the Strawflower Access Road, west of Highway 1. The asphalt concrete surface across the parking lot is essentially flat-lying. Thick overgrowth associated with Pilarcitos Creek riparian zone borders the parking lot to the south and west.

EKI researched existing utilities in the project area. Existing utilities are shown in Figure 1. The utilities north of the creek are summarized as follows:

- There are no overhead utilities in the Project area north of the creek.
- The District's existing 8-inch water main wraps around the Safeway in the parking lot to the Strawflower Access Road.
- According to maps provided by Pacific Gas and Electric Company (PG&E) and an existing easement, a 2-inch gas main and 3-inch electrical conduit run between the District's water line and the Safeway building. Per the PG&E maps, the 2-inch gas main extends parallel to the proposed crossing for approximately 150 feet, before it bends east towards Highway 1. The proposed crossing maintains a horizontal clearance from the gas main of at least 13 feet, but the exact location of the gas main must be verified by the contractor before construction.[1]
- A 12-inch sanitary sewer owned by the City runs southeast behind the Safeway in the parking lot to a manhole located in the vegetated area south of Safeway. From this manhole, parallel 6" and 4" sanitary sewer siphons run south under the creek to a manhole located along the southern bank of the creek. The project is anticipated to cross these siphons approximately 25 feet south of the manhole north of the creek. No as-built records are available for these siphons. The District contracted with PSI to

[1] Note that the location per the PG&E map is inconsistent with the location of the PG&E easement. There is additional clearance from the proposed crossing according based on the PG&E easement.

perform a GPR survey of the siphons. PSI marked the measured depths of both siphons at several locations between the upstream manhole and the creek bed. At the proposed crossing location, the upper 4" siphon is assumed to have approximately 6.25' of cover and the deeper 6" siphon is assumed to have 7.25' feet of cover based on the GPR measurements. The siphons are exposed above grade on the southern side of the creek bed, as shown on Figure 5.

Figure 5 – Exposed twin sanitary sewer siphons in Pilarcitos Creek, facing west.

The south end of the proposed crossing is in Oak Avenue Park along the north side of Oak Avenue, in the flat-lying, grassy area east of the bathroom and playground facilities. This park and the parcels in the creek riparian zone are owned by the City. There are no known underground or overhead utilities in the area of the park at the south end of the proposed crossing. A paved walking path with three small bridges runs north of the grassy area adjacent to the creek vegetation. A wire fence borders the creek vegetation to the south, north of the path. Due to the density of the brush, the creek bed has very limited accessibility from the south.

Based on the topographic survey data, the existing ground surface is approximately 42 feet on the north side of the proposed crossing and approximately elevation 44 feet on the south side of the proposed crossing.[2] The elevation of the bottom of the creek along its centerline near the proposed crossing is between approximately elevation 27 and 29 feet.

[2] All elevations are based on the North American Vertical Datum of 1988 (NAVD88).

The pipe on the south end that connects to the new crossing is proposed to be installed in an open trench south to Oak Avenue and east in the Oak Avenue right-of-way, where it will connect to the existing 8-inch water main at Pilarcitos Avenue. Oak Avenue consists of a two-lane street with parallel parking spaces along each side. The south side of the street (across from the park) is occupied by private residences. Oak Street utilities include the following:

- A 2-inch gas main runs along the northern back of walk;
- a 6-inch sanitary sewer runs along the centerline of the street;
- an existing 4-inch water main runs between the sanitary sewer and the southern edge of pavement; and
- An overhead electrical line runs behind the back of walk on the south side of the street and extends east across Pilarcitos Avenue.

Pilarcitos Avenue has been identified as a potential laydown area to pre-fabricate the new pipe before pullback. Pilarcitos Avenue is a two-lane residential street with private residences located only on the west side. The east side of the street is undeveloped and does not contain any driveways between Oak Avenue and Willow Avenue (approximately 485 feet), so it is well-suited for laying down and fabricating the pipe. An overhead electrical line runs along the east side of the street behind the back of walk.

3.2. Boundary Survey

O'Dell Engineering performed a boundary survey of the Project area to determine the property and easement ownership and location of property boundaries and easements as defined by an analysis of available record maps, title reports, supporting documents, and physical evidence. A boundary survey exhibit is included in Appendix A. A summary of the reviewed title reports is included in Table 1, below.

As listed in Table 1, an open-space conservation easement exists in Strawflower Shopping Center property (APN 056-300-150), which restricts development in the Pilarcitos Creek riparian zone and designates areas for permitted encroachments. The easement, however, explicitly exempts "the installation or repair of underground utility lines and septic systems" from the development restrictions. Therefore, this easement should not affect the Project implementation beyond what is typically required for the California Environmental Quality Act (CEQA) and California Coastal Act compliance (see Section 5).

Table 1 – Summary of Title Reports Included in Boundary Survey

Title Report No.	APN(s)	Owner	Easements
55914-1664743-19	056-141-950 056-141-960 056-141-970	City of Half Moon Bay	• Electrical transmission line, Great Western Power Company of California (location cannot be determined - not mapped) • Water main, Coastside County Water District (location cannot be determined - not mapped)
55914-1664750-19	056-300-150	HMB Musich, LLC	• Electrical and Gas Utilities, PG&E • Water main, Coastside County Water District • Sanitary sewer lines, City of Half Moon Bay • Electrical wires and pipeline, Augustino Tesi and others • Open-space conservation easement, Half Moon Bay Open Space Trust. •
55914-00007-19	056-300-210	City of Half Moon Bay	• Sanitary sewer lines, City of Half Moon Bay
55914-00010-19	115-040-998	Cypress-By-The-Sea HOA and Eight Condominium Owners (Common Area Portion) City of Half Moon Bay (Public Right-of-Way Portion)	• 15' Public Utilities Easement • Sanitary sewer lines, City of Half Moon Bay
55914-00009-19	115-040-999	Cypress-By-The-Sea HOA and Eight Condominium Owners	• 15' Public Utilities Easement • Sanitary sewer lines, City of Half Moon Bay

3.3. Geotechnical Conditions

GLA advanced two geotechnical borings, one on each side of the creek, on 27 September 2019 to evaluate the ground conditions to be expected along the replacement water pipeline alignment. The geotechnical report is included in full in Appendix A, and key surface and sub-surface conditions are summarized below.

GLA drilled and collected samples from the following exploratory borings, which are shown on the 30% Design Drawings (Appendix C):

- Boring DH-1 on the north side of the creek, in the asphalt section behind Safeway; and

- Boring DH-2 on the south side of the creek, in the grassy area of the Oak Avenue Park near the intersection of Pilarcitos Avenue and Oak Avenue.

According to available geologic maps, subsurface soils encountered on the site consist generally of alluvial fan and stream terrace deposits.

In drill hole DH-1, GLA observed very stiff to hard clay with sand to sandy clay to a depth of about 12 feet below ground surface (bgs), underlain by medium dense clayey sand to a depth of about 20 feet bgs. Below, GLA observed stiff lean clay to clayey silt to a depth of about 24½ feet bgs and medium dense to dense clayey sand to very stiff sandy lean clay to a depth of about 27½ feet bgs. Alternating layers of stiff clay and dense to very dense clayey sand and clayey sand with gravel were encountered below to the maximum explored depth of 50 feet bgs.

In drill hole DH-2, GLA observed very stiff to hard clay to a depth of about 9½ feet bgs, underlain by alternating layers of medium dense clayey sand and stiff to very stiff sandy clay and clay to a depth of about 22 feet bgs. These soils are underlain by medium dense to very dense clayey sand and clayey sand with gravel to the maximum explored depth of 50 feet bgs.

Groundwater was encountered in both DH-1 and DH-2 at a depth of approximately 18 and 18.5 ft bgs, respectively, which correspond to elevations of approximately 23.5 feet in DH-1 and 22 feet in DH-2. GLA notes that seasonal groundwater fluctuations may occur, and that groundwater is likely affected by the water level in Pilarcitos Creek.

The soil conditions are not anticipated to present significant challenges for HDD installations, as GLA did not encounter significant cobbles and boulders in either boring.

4. PRELIMINARY DESIGN

4.1. HDD Design Considerations

4.1.1. Design Standards and References

Design of pipeline crossing Pilarcitos Creek will be completed per the following standards and reference materials:

- ASTM-F1962 (2005), "Standard guide for use of maxi-horizontal directional drilling for placement of polyethylene pipe or conduit under obstacles, including river crossings", ASTM International.
- AWWA C906-15 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. through 65 In. (100 mm Through 1,650 mm), For Waterworks.
- Handbook of PE Pipe, Second Edition, "Chapter 3 - Material Properties, Appendix B". Irving Tx: The Plastic Pipe Institute, 2008.
- Handbook of PE Pipe, Second Edition, "Chapter 12 - Horizontal Directional Drilling". Irving Tx: The Plastic Pipe Institute, 2008.
- Horizontal Directional Drilling (HDD) Good Practices Guidelines, Fourth Edition. North American Society for Trenchless Technology, 2017.
- Duyvestyn, Glenn (2009), "Comparison of Predicted and Observed HDD Installation Loads for Various Calculation Methods", Proceedings, NO-DIG 2009 International Conference, Toronto, ON, paper B-1-01.

4.1.2. Pipe Size and Material

The new pipe must be sized to match the 8-inch inner diameter of the existing crossing and connecting piping. The product pipe material for HDD projects must be fully restrained and be flexible or have flexible joints. The most commonly used pipe materials for HDD projects are fused high-density polyethylene (HDPE) and fusible polyvinylchloride (FPVC). Restrained joint ductile iron pipe (DIP) is another option, but DIP requires cathodic protection and is limited to 5-degree flexibility at the joint, meaning it is not as flexible as HDPE or FPVC and may not work for short crossings. HDPE is more flexible than FPVC but has a thicker wall than FPVC for the same pressure class. The two products are usually cost competitive for the same project.

For purposes of this PDR, based on direction from the District, EKI assumed the product pipe will be butt-fused HDPE. The District has successfully installed HDPE pipes as part of the El Granada Pipeline Replacement Final Phase and Highway 1 South HDD projects. EKI could evaluate other pipe materials as part of the detailed design if directed to by the District.

The pipe's working pressure, or "the maximum anticipated, sustained operating pressure applied to the pipe exclusive of transient pressures" as defined by AWWA C906, is approximately 100 pounds per square inch (psi) at the bottom of the proposed bore path based on the current system operations. Future system operational changes could potentially increase the working

pressure to approximately 150 psi.[3] Based on this working pressure, a DR 13.5 PE4000 (Pressure Class 160 psi) pipe could be installed to accommodate anticipated internal pressures. As discussed in Section 4.1.4, however, a DR 11 PE4000 (Pressure Class 200 psi) pipe is required to resist pullback forces. Because of the HDPE pipe thickness, a nominal 10-inch DR 11 HDPE Iron Pipe Size (IPS) pipe is needed to meet the required 8-inch inner diameter and pressure class requirements.

For the open trench sections of the project that will connect the 10-inch HDPE crossing to the existing pipe on each side of the creek, 8-inch Class 52 DIP will be installed per the District's standards. HDPE adapters or mechanical joint fittings with the appropriate HDPE restraints will be used to connect the two pipe materials.

4.1.3. Bore Geometry Design

EKI developed an initial bore geometry design based on the site constraints, typical HDD entry and exit angles, the allowable minimum bending radii for HDPE pipe and HDD tooling, and assumed minimum depths of cover below the existing sanitary sewer and creek bed. EKI assumed a 20-foot minimum depth of cover below the creek bed, equivalent to the depth of cover of the pipe installed as part of the District's El Granada Final Phase HDD crossing, and typical minimum clearance below creeks to minimize the chance for fracking out of drilling fluid.[4] The bore geometry provides a depth of cover of approximately 15 feet below the lower sanitary sewer siphon based on the results of the GPR survey conducted over the siphons (see Section 3.1). The preliminary design assumes that the drill rig and entry point will be located north of the creek and pipe assembly and pullback will be staged south of the creek based on staging and work area considerations discussed in Section 4.1.7. Typical entry angles range from 5 to 18 degrees, and exit angles are typically shallower to ensure that the pipe can enter without excessive bending stresses and breakover height.

As discussed below, EKI confirmed the viability of this preliminary alignment by calculating pullback loads, pipe stresses, hydrofracture risk, and settlement risk associated with the alignment. The bore plan and profile are shown on Sheet C-1 of the 30% Design Drawings (Appendix C). A schematic of the typical bore geometry parameters is shown on Figure 5, and the design parameters for the preliminary HDD crossing alignment are listed in Table 2.

[3] The pipeline would see this pressure if the pressure reducing valves that reduce pressure to downtown Half Moon Bay were fully opened.

[4] The EL Granada Final Phase HDD crossing was designed and permitted with a depth of cover below the Creek bed of 15 feet, but the contractor chose to install the pipe with 20 feet of cover.

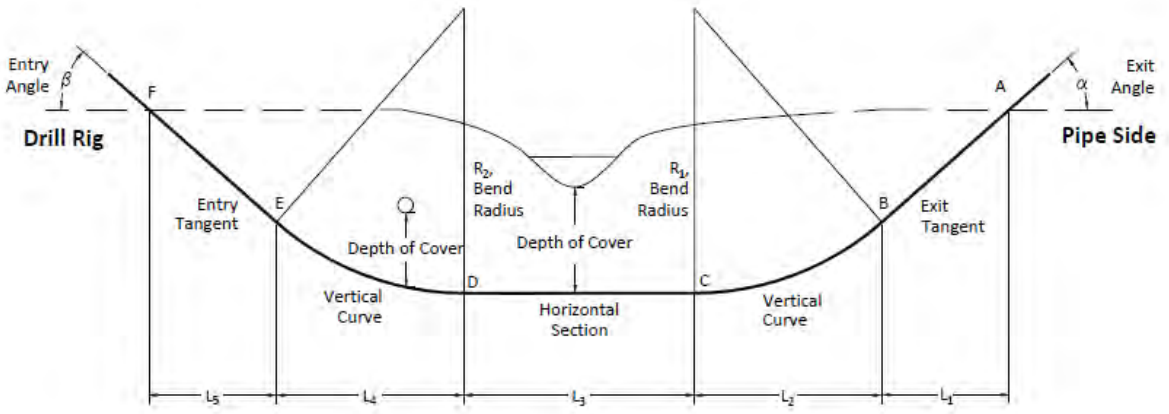


Figure 6 – Schematic of Typical Bore Geometry Design Parameters

Table 2 – Design Parameters for the Project's Preliminary HDD Crossing Alignment

Parameter[1]	Value
Entry Angle, β (degree)	15
Exit Angle, α (degree)	15
Horizontal Length of Bore Section 1 (straight tangent F to E), L_5 (feet)	59.1
Horizontal Length of Bore Section 2 (vertical curve E to D), L_4 (feet)	129.4
Horizontal Length of Bore Section 3 (horizontal section D to C), L_3 (feet)	85.9
Horizontal Length of Bore Section 4 (vertical curve C to B), L_2 (feet)	129.4
Horizontal Length of Bore Section 5 (straight tangent B to A), L_1 (feet)	65.3
Total Horizontal Length of Bore, L (feet)	469.2
Bend Radius of First Vertical Curve, R_2 (feet)	500
Bend Radius of Second Vertical Curve, R_1 (feet)	500
Depth of Cover Below Existing Sanitary Sewer Siphon (feet)	15
Depth of Cover Below Creek Bed (feet)	20
Notes: **(1) The numbering of the symbol subscripts is ordered based on the pipe pullback path (i.e., the reverse of the pilot bore path).**	

During preliminary design, EKI also evaluated an alternative alignment that ran from the Safeway parking lot to the turnout at the western end of Oak Avenue. This alignment would potentially be a shorter length and could eliminate the existing water main dead end at the end of Oak Avenue. However, based on preliminary analysis and discussions with several HDD contractors, EKI determined that the entry/exit angles and vertical curve bend radii would need to be far outside standard industry parameters to avoid staging area limitations and restricting access to residents along Oak Avenue during construction. This alternative alignment was not further evaluated.

4.1.4. Pipe Pullback Force and Stress Analysis

Pipes installed by HDD are subject to a variety of stresses during installation and long-term operation, including tensile pulling stresses, bending stresses, and external hoop or hydrostatic buckling stresses associated with earth loads and drilling fluid pressures. These loads and stresses must be evaluated to ensure that the proper pipe material and thickness are specified, and the design is adequate.

EKI calculated the anticipated stresses following the design guidelines of the Plastic Pipe Institute, ASTM F1962-05, and the HDD Good Practices Guidelines based on the preliminary bore geometry, pipe size and material (10-inch HDPE), and assumptions regarding drilling fluid properties and other contractor means and methods that include a level of conservatism relative to best practices. The following load conditions were evaluated:

1. Installation: Pullback forces on the pipe during installation using manufacturers' material properties to check tensile stress and buckling, assuming the pipe is installed empty (i.e., with no ballast) and is staged on rollers on the ground surface to reduce friction.
2. Operation: Post-installation loads from earth pressures to check pipe deflection and unconstrained buckling and hoop stresses, assuming the pipe is drained and empty for 1,000 hours (i.e., approximately 42 days).

The pullback load and stress calculations are provided in Appendix D. Based on the conditions and design guidelines described above, EKI determined that 10-inch DR 11 HDPE (PE 4000) will be able to resist the anticipated loads on the pipe according to the factors of safety prescribed in the design guidelines. Pullback stresses on the pipe could be further reduced by installing the pipe with ballast (i.e., filled with water); however, calculations indicate that ballast is not required.

If the District would like to evaluate a different pipe material such as FPVC, the analysis would need to be redone based on the other pipe's material properties.

4.1.5. Hydrofracture Analysis

As discussed in Section 2, hydrofracture is a serious concern for HDD installations that cross sensitive areas such as Pilarcitos Creek. Hydrofracture risks for the HDD alignment of this project have been evaluated, as detailed below, to ensure that the design is adequate to prevent hydrofracture.

The hydrofracture analyses were based on the procedures outlined in the HDD Good Practices Guidelines that evaluate and compare at each point along the alignment the maximum allowable drilling fluid pressure that the soil can withstand before hydrofracture occurs (P_{max}) and the minimum required pressure to return the soil cuttings to the surface (P_{min}). Locations where P_{min} exceeds the P_{max} have elevated risk of hydrofracture. The risk of hydrofracture was analyzed for drilling of the pilot bore only because this step of the HDD process is when the pressures on the borehole sidewalls are highest and the risk of hydrofracture is highest. The risk of hydrofracture

decreases dramatically for reaming passes due to the larger diameter bore resulting in lower downhole pressures and the drilling fluid being able to travel to either the exit or entry point.

The Delft Cavity Expansion Model is used to calculate P_{max} as outlined in the HDD Good Practices Guidelines and discussed in other sources (Bennett and Wallin, 2008, Staheli, et. al., 1998; Delft Geotechnics, 1997; Luger and Hergarden, 1988). The maximum allowable pressure is the safe upper bound value of allowable drilling fluid pressures for the HDD bore and is dependent on the depth of earth cover and the soil properties. The calculations assume homogeneous soil properties within each modeled soil layer and do not explicitly account for the possibility of preexisting preferential seepage paths to the ground surface. However, no potential preferential seepage paths have been identified for this project, based on the geotechnical investigation performed. The radius of plastic zone (R_{pmax}) is assumed to be 50% of the depth to the ground surface, providing a factor of safety.

The Bingham Plastic Model is used to calculate P_{min} based on the procedures outlined in the HDD Good Practices Guidelines and discussed in other sources (Ariaratnam, et al, 2003; Duyvestyn, 2009). The model assumes laminar flow conditions. The laminar flow approach generates a conservative result since the conditions will more likely be a combination of laminar and turbulent flow. The minimum required pressure is dependent on the length, depth, and diameter of the bore, as well as the drilling fluid properties. The assumptions regarding drilling fluid properties and other contractor means and methods include a level of conservatism relative to best practices. The assumed values approach the lower bounds of what could be considered good drilling practices. In this way, the resulting analysis includes an inherent qualitative factor of safety for competent HDD contractors who employ good practices.

4.1.5.1. Geotechnical Model

In addition to the bore geometry and drilling fluid properties the hydrofracture risk analysis described above is largely dependent on the geotechnical conditions (see Section 3.3). Representative average geotechnical parameter values were selected for each soil layer based on a review of the Project geotechnical report (GLA, 2019), the boring logs for DH-1 and DH-2, and an idealized soil profile provided by GLA (Figure 6).

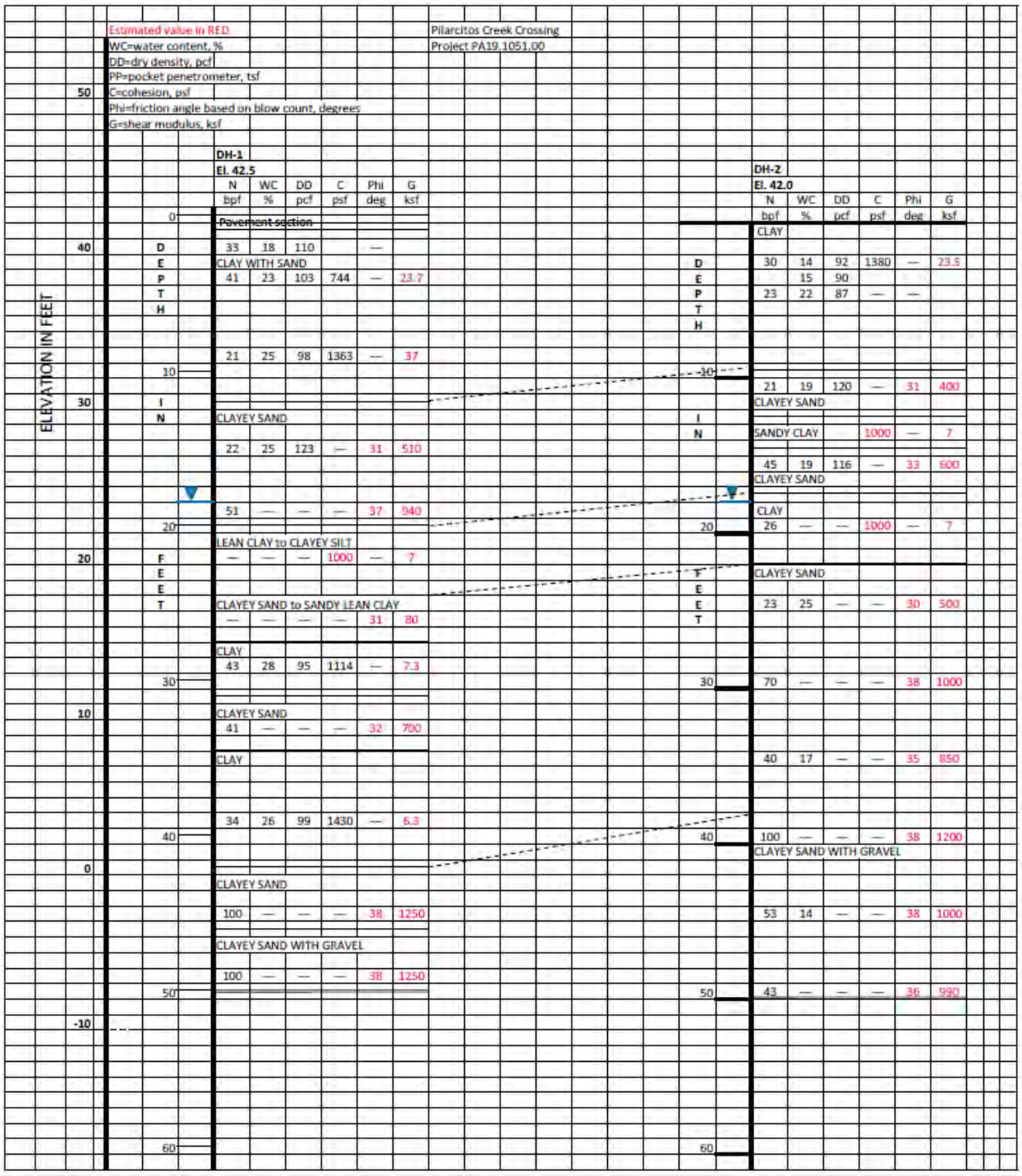


Figure 7 – Idealized Soil Profile (Courtesy of GLA)

The geotechnical model, including the parameters assumed for each soil layer, is summarized in Table 3, below. The geotechnical layer profile used in the hydrofracture analysis relative to the preliminary bore path is shown on Figure 7.

Table 3 – Assumed Geotechnical Parameters Used in the Hydrofracture Analysis

Soil Group No.	Soil Type	Elevation of Strata Top	Elevation of Stata Bottom	Unit Weight, γ (pcf)	Max Thickness (ft)	Friction Angle, φ (degree)	Shear Modulus, G (psf)	Cohesion Coeff., c (psf)
1	Clay to Clay with Sand	42	30.5	110	11	0	30,000	1,350
2	Clayey Sand	32.5	22.5	125	8	31	550,000	0
3	Clay to Clayey Silt	24.5	18	125	4.5	0	7,000	1,000
4	Clayey Sand to Clay	20	0.5	110	17.5	30	450,000	0
5	Clayey Sand with Gravel	4	-7.5	125	12	36	990,000	0

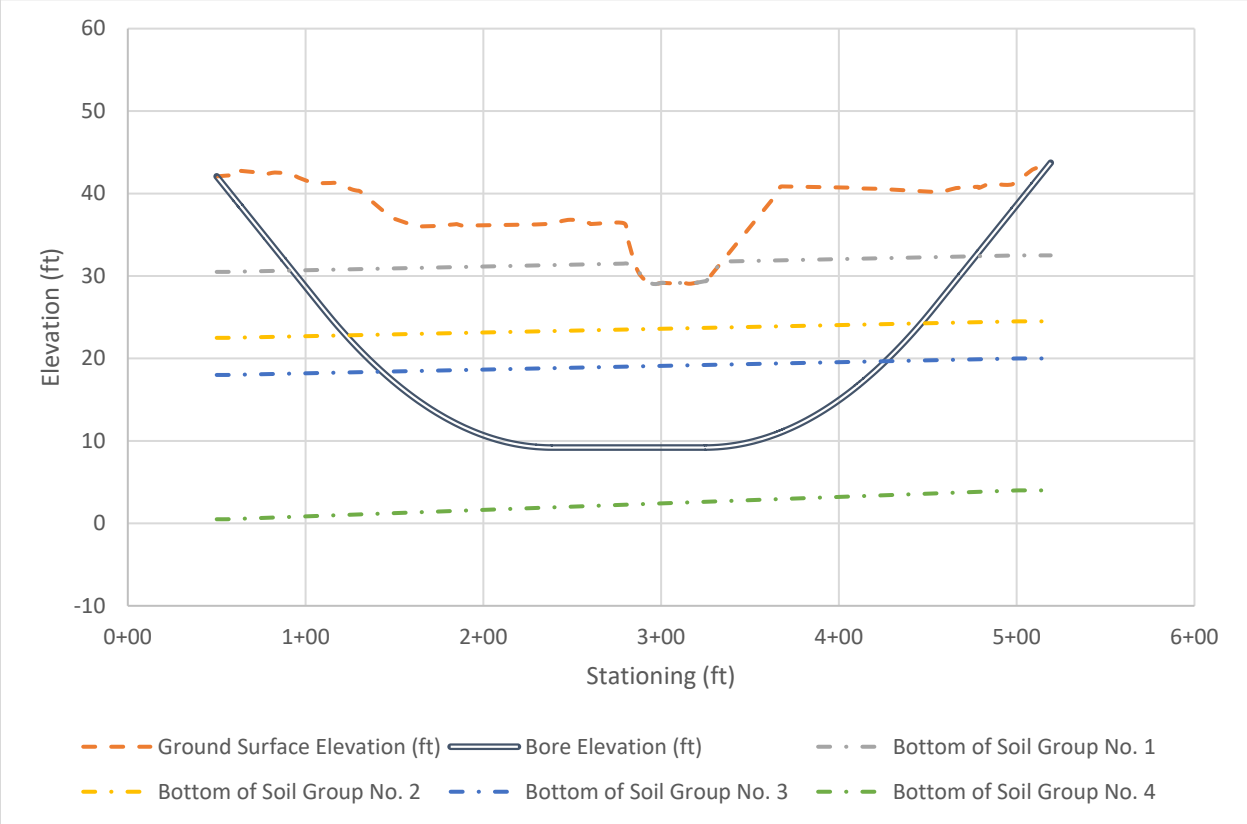


Figure 8 – Bore Geometry and Interpolated Soil Layers for HDD Crossing of Pilarcitos Creek

4.1.5.2. Results of Hydrofracture Analysis

The results of the hydrofracture evaluation for the pilot bore are calculated in Appendix E and shown on Figure 8. Figure 8 plots both the ground surface and bore profile in feet of elevation (top) on the secondary y-axis and P_{min} and P_{max} in psi (bottom) on the primary y-axis against horizontal stationing on the x-axis. The maximum allowable pressure that the soil can withstand before plastic yield (hydrofracture), P_{max}, increases with increasing depth of cover, with the lowest allowable pressures near the entry and exit points. The minimum required pressure to return the drilling fluid to the entry point, P_{min}, increases as the distance from the entry point increases and as the depth of the bore increases. As discussed above, critical locations (i.e., where the risk of hydrofracture is elevated) occur where P_{min} exceeds P_{max}.

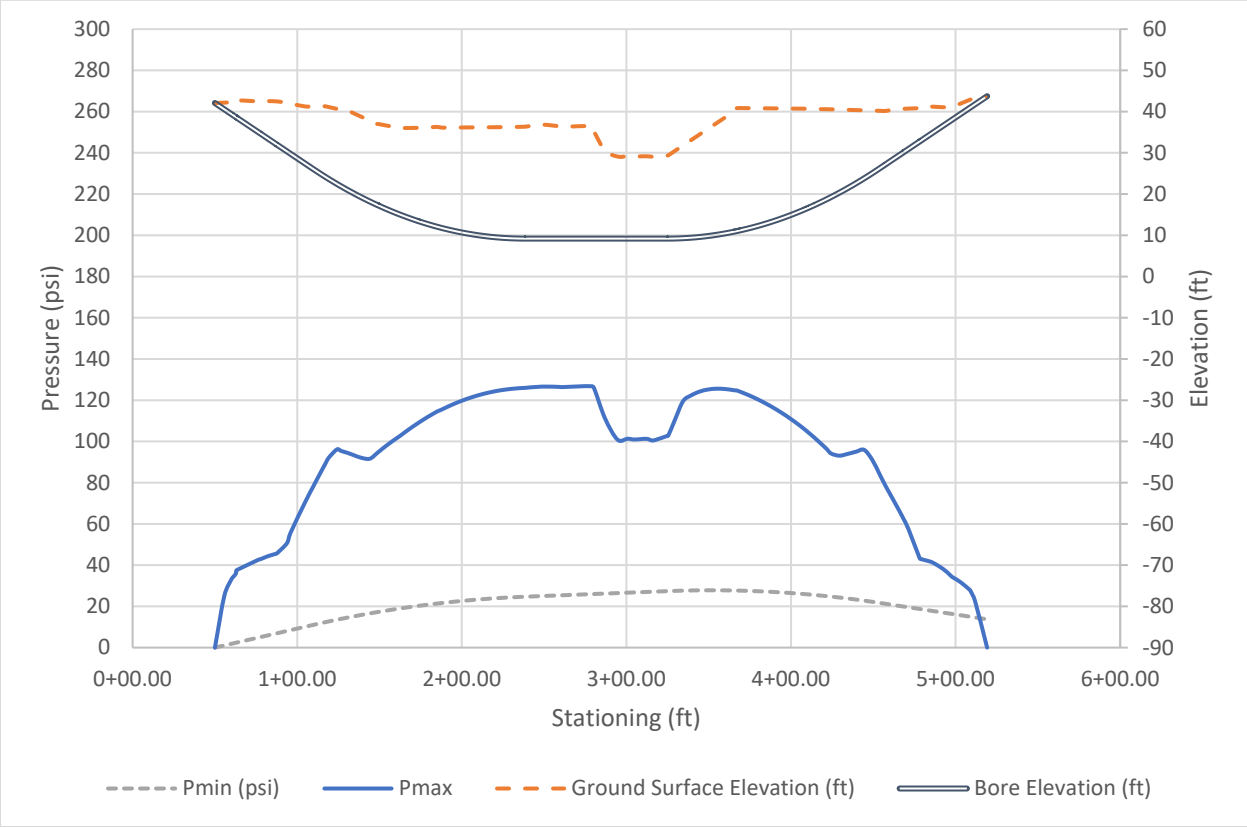


Figure 9 – Results of Hydrofracture Analysis Along HDD Alignment

The results show that the risk of hydrofracture during the pilot bore for this HDD crossing is low for most of the bore, with a slight risk of hydrofracture near the entry and exit points where the depth of cover is lowest. Hydrofracture at these locations can be controlled by entry and exit mud pits and by implementation of an emergency hydrofracture preparedness plan, which the contractor will be required to prepare before construction. More importantly, the risk of hydrofracture within the creek channel is estimated to be low due to the proposed bore geometry and the anticipated high strength nonpermeable soils.

It is important to note that the actual risk of hydrofracture during construction is dependent on contractor means and methods and actual ground conditions along and above the bore. For example, we assumed a pilot bore diameter of 8 inches and a drill pipe diameter of 4 inches. If the pilot bit used is smaller, with the same size drill pipe, the hydrofracture risk would increase. As such, the contractor will be required to submit their hydrofracture analysis that reflects their planned means and methods before installation to verify these results.

Similarly, if the soils beneath the creek channel are significantly different than those encountered in the geotechnical borings, the risk of hydrofracture could be affected. The results of these analyses apply to HDD work performed using industry good practices and within the parameters assumed in the analysis, which is based on the gathered topographical and geotechnical data.

4.1.6. Settlement Analysis

During HDD or after the pipe is installed, the collapse of the annular space between the pipe and the bore can result in settlement. Given that proposed crossing is predominately under an undeveloped area, settlement is not a major concern except where the bore crosses under the existing twin sanitary sewer siphons at approximately Station 1+74. Based on the depths of the siphons recorded as part of the GPR survey (see Section 3.1) and proposed depth of cover between the siphons and the new pipe (15 feet), EKI estimated the settlement risk associated with the HDD bore at the location of the twin sanitary sewer siphons.

The evaluation follows the approach outlined in the HDD Good Practices Guidelines. Settlement calculations are included in Appendix F. Based on the assumed depth of clearance from the sewer above the crown of the bore (not the pipe) and a settlement trough volume (V_s) of 0.5 x the volume of the annulus (V_a), the maximum settlement at the siphon is expected to be approximately 0.4 inches. This settlement trough volume assumption is likely conservative and could be as low as one third the volume of the annulus per the HDD Good Practices Guidelines (i.e., the calculation includes a factor of safety). Additionally, the design will require timely contact grouting of the annulus, which will also reduce the potential for settlement, and for the Contractor to perform pre- and post-installation CCTV inspections of the siphon. Based on these calculations and the proposed grouting and CCTV inspections, EKI finds that the risk of damaging the siphons as a result of the bore is low.

4.1.7. Work Area Considerations

As discussed in Section 2, an adequate work area for the HDD operations is a key component of an HDD design. An area of the parking lot behind Safeway was selected for the drill rig side of the installation based on the available space and to limit the disruption to residents. Enough space must be available on the rig side to accommodate the HDD rig, entry pit, mud mixing plant, and separation plant. The layout of the HDD equipment is generally flexible within a given space. As shown on Figure 10 and Sheet C-2 of the 30% Design Drawings (Appendix C), the preliminary design has delineated a work area of approximately 10,000 square feet (SF) in the parking lot, which should be enough space given the anticipated HDD rig size. This work area would all be located on private property owned by the Strawflower Village shopping center.

The exit side work area ideally has enough space to fabricate the entire pipe string prior to pull back and is wide enough to accommodate equipment for pipe support during pullback and fusion equipment. As shown on Figure 10 and Sheet C-2, the proposed exit side work area extends around the exit location in the Oak Avenue Park and south down the east side of Pilarcitos Avenue. The work area in Pilarcitos Avenue is long enough to fabricate the entire pipe length without crossing Willow Avenue. At least one lane of traffic will be maintained on the west side of Pilarcitos Avenue, and no driveways will be blocked. During pullback, the pipe string will curve around the corner of Oak Avenue and Pilarcitos Avenue to the exit point. Most of the exit side work area is in the public right-of-way. Approximately 4,000 SF is in the City-owned park.

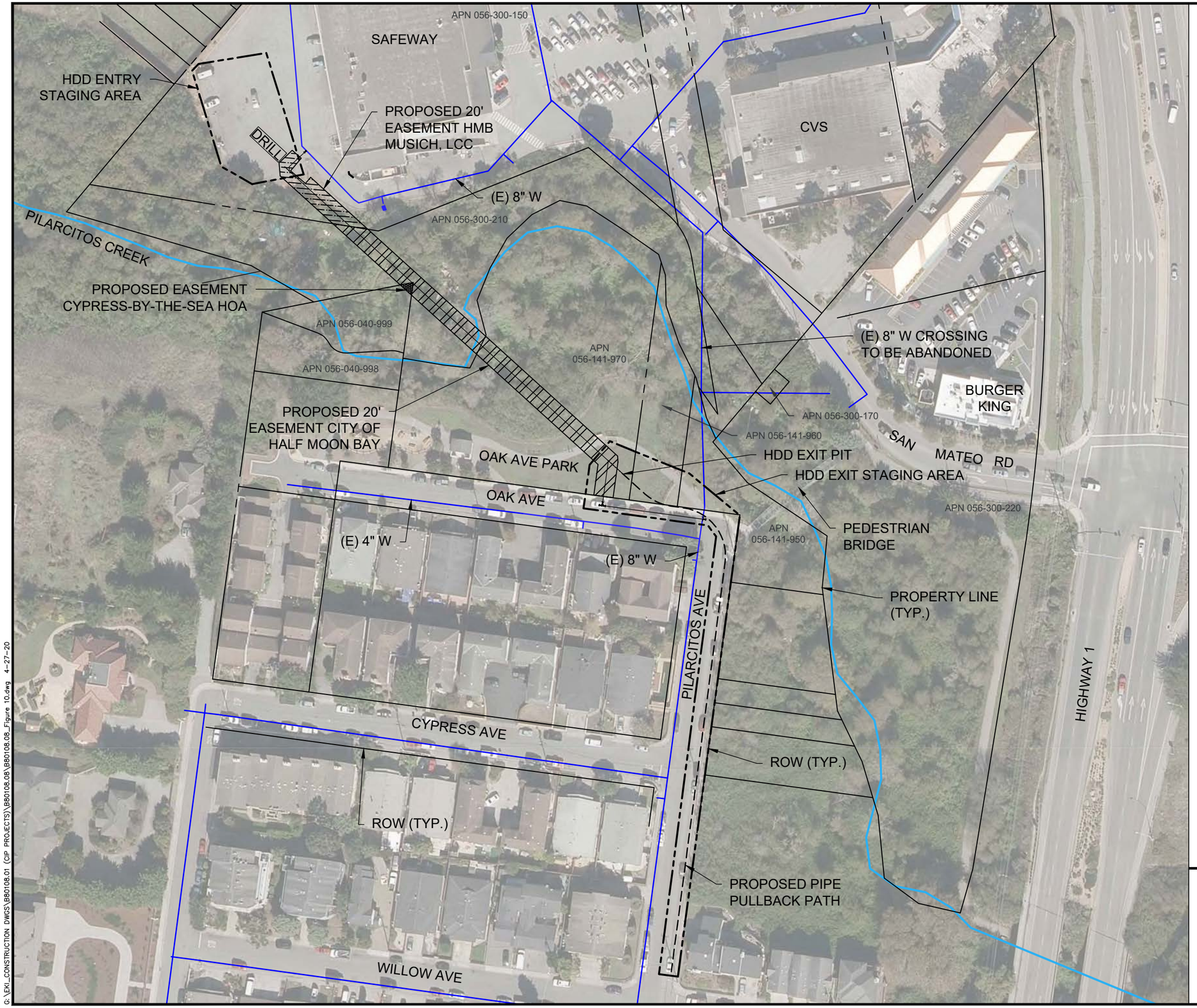
4.2. Open Trench Design Considerations

As discussed in Section 4.1.2 and shown on Sheet C-1 (Appendix C), there will be sections of DIP installed by open-trench construction on each side of the HDD crossing to connect to the existing water mains. The open trench sections will be Class 52 DIP, encased in polyethylene wrap, with a minimum 3-feet of cover per District standards. The connection north of the creek could be installed either by hot tap or cutting in a tee with a shutdown, depending on District preference. The connection south of the creek can be installed by cutting in a new tee and valve cluster without loss of service.

The PDR assumes that this Project will be completed prior to the District's Pine Willow Oak Project, which will replace the existing 4-inch water main on Oak Avenue with a new 8-inch main. Therefore, the preliminary design assumes that the exit side open trench section will extend east on Oak Avenue to the existing 8-inch crossing near Pilarcitos Avenue. The new pipe will include valves and caps on each end along Oak Avenue to facilitate extending this line as part of the Pine Willow Oak Project. All water service laterals will remain connected to the existing 4-inch water main along Oak Avenue until the Pine Willow Oak Project is completed, at which point service laterals will be reconnected to the new 8-inch water main.

4.3. Abandonment of Existing Crossing

The existing crossing will be cut and capped at each end and abandoned in place.



Legend:

- ROW /Property Line
- Existing Water Line
- Proposed Water Line
- Approximate Creek Flow Line
- Proposed Permanent Easement - HMB Musich, LCC
- Proposed Permanent Easement - City of Half Moon Bay
- Proposed Permanent Easement - Cypress-By-The-Sea HOA
- Staging Area
- DRILL — HDD Drill Rig Location

Abbreviations:

APN	Assessor's parcel number
(E)	Existing
(N)	New
ROW	Right-of-Way
TYP.	Typical
W	Water

Notes:

1. All locations are approximate.

N

0 100 200

(Scale in Feet)

Proposed Staging Areas and Easements

Coastside County Water District
Half Moon Bay, CA
April 2020
EKI B80108.08

Figure 10

G:\EKI_CONSTRUCTION_DWGS\B80108.01 (CIP PROJECTS)\B80108.08\B80108.08_Figure 10.dwg 4-27-20

5. PERMITTING, CEQA, AND EASEMENTS

The project will need to comply with the California Environmental Quality Act (CEQA) and the California Coastal Act. No additional environmental permits will be required.

Because there will technically be no impact to the creek, except in the event of hydrofracture, the California Department of Fish and Wildlife (CDFW) recommends but does not require a 1602 Lake and Streambed Alteration Agreement (LSAA) for HDD projects that cross under waterways. The District can decide based on its risk tolerance to apply or not. For the El Granada Final Phase Project completed in 2016, the District decided not to apply for an LSAA because the risk of hydrofracture was anticipated to be low and measures were put in place to mitigate the risk of hydrofracture, including specialty HDD inspection services, development of a frac-out plan, and an independent hydrofracture analysis by the contractor. Based on the results of the hydrofracture analysis discussed in Section 4.1.5, we assume that the District will follow a similar approach for this Project and not apply for an LSAA. If the District decides to apply for an LSAA, the permitting process would significantly delay the project schedule.

The District will serve as the lead agency for the CEQA compliance effort. Based on our understanding of the Project, we believe that the project will not qualify for a categorical exemption because the construction has the potential to result in environmental impacts (e.g., cultural resources and noise) that could require mitigation measures. Therefore, we assume that an Initial Study/Mitigated Negative Declaration (IS/MND) will be required and a cultural resources evaluation will be needed to support the IS/MND. After the CEQA process, the District will also need to apply for a Coastal Development Permit through the City's Planning Department. This is the same process that was required for the El Granada Final Phase Project.

The District will need to purchase permanent and temporary construction easements for this Project. Table 4 summarizes the required temporary and permanent easements by parcel. The proposed permanent easements are also shown on Figure 10.

Table 4 – Summary of Easement Requirement

APN	Property Owner	Approximate Permanent Easement Area[1] (SF)	Approximately Temporary Construction Easement Area[2] (SF)
056-300-150	HMB Musich, LLC	1,840	10,000
056-040-999	Cypress-By-The-Sea HOA and Eight Condominium Owners	85	N/A
056-300-210	City of Half Moon Bay	3,550	N/A
056-141-970, -60, -50	City of Half Moon Bay	4,270	5,700

Notes:
1. Assumes 20-foot permanent easement centered on proposed alignment.
2. Areas are inclusive of permanent easement areas.

An encroachment permit with the City will also be required for the open trench section along Oak Avenue and the work area needed to fabricate the pipe string along Pilarcitos Avenue.

6. PRELIMINARY DESIGN PLANS

The 30% plan and profile sheet and construction staging area plan for the Project are included in Appendix C.

7. OPINION OF PROBABLE CONSTRUCTION COST

A preliminary Opinion of Probable Construction Costs (OPC) was prepared for the Project as described in this PDR and is presented in Table 5, below. The OPC assumes an overall 25% contingency and a 3% escalation to the midpoint of construction in Fall 2020. The OPC has an expected accuracy range of -20% to +30%, in conformance with AACE International Class 3 estimates (AACE International, 2019).

Table 5 – Total Project Opinion of Probable Construction Cost[5]

Item	Description	Unit	Qty.	Unit Price	Item Cost
1	Horizontal Directional Drilling, Including Furnish and Install 10" DR 11 HDPE Pipe	LF	470	$ 430	$ 202,100
2	Furnish, Install and Backfill 8-inch DIP	LF	181	$ 230	$ 41,630
3	Fitting: Furnish and Install 8" Tee	EA	2	$ 1,400	$ 2,800
4	Fitting: Furnish and Install 8" 45 Degree Bend	EA	3	$ 1,100	$ 3,300
5	Fitting: Furnish and Install 8" 11.25 Degree Bend	EA	1	$ 1,000	$ 1,000
5	Fitting: Furnish and Install 8" x 6" HDPE Reducer with HDPE Adaptor	EA	2	$ 1,500	$ 3,000
6	Fitting: Furnish and Install 8" Cap	EA	2	$ 800	$ 1,600
7	Furnish and Install 8" Gate Valve	EA	4	$ 2,600	$ 10,400
8	Plug to Abandon Existing Water Main	EA	2	$ 1,500	$ 3,000
9	Connection to Existing 8" Water Main behind Safeway (Includes tapping sleeve and valve)	EA	1	$ 10,000	$ 10,000
10	Connection to Existing 8" Water Main at Oak Ave and Pilarcitos Ave (Includes Couplings)	EA	1	$ 8,000	$ 8,000
11	Final Paving of Water Main Trench	SF	800	$ 10	$ 8,000
12	Final Site Restoration	SF	300	$ 5	$ 1,500
13	Pre- and Post-Installation CCTV Inspection of Sanitary Sewer Siphons	LS	1	$ 7,500	$ 7,500
				Subtotal	**$ 303,830**
				Contingency (25%)	$ 75,958
				Total	**$ 379,788**
				Escalation (3%)	$ 11,394
				Grand Total[6]	**$ 391,182**

[5] The OPC has an expected accuracy range of -20% to +30%, in conformance with AACE International Class 3 estimates for projects at the 10%-40% design level.

[6] Grand Total is rounded to the nearest thousand dollars.

An estimated Opinion of Total Project Costs, including construction, design, construction management, permitting, and administration costs is included in Table 6, below. The Opinion of Total Project Costs does not include the cost to acquire easements.

Table 6 – Opinion of Probable Total Project Cost

Item No.	Description	Total Cost[7]	Notes
1. Engineering Design Costs			
1.1	Preliminary Design (Including Surveying and Geotechnical Investigations)	$ 105,000	Existing Preliminary Design Fee
1.2	Detailed Design	$ 35,000	Estimated Future Detailed Design Fee
	Engineering Design Subtotal	**$ 140,000**	
2. Construction Costs			
2.1	Construction Costs	$ 304,000	See Table 5
2.2	25% Construction Contingency	$ 76,000	See Table 5
2.3	3% Escalation	$ 11,000	See Table 5
	Construction Subtotal	**$ 391,000**	
3. Administration Costs			
3.1	Construction Management and Engineering Services During Construction	$ 49,000	Assumed 12.5% of Total Construction Costs
3.2	Permitting Fees	$ 5,000	Estimated
3.3	Easement Costs	Not Included	
3.4	CEQA Compliance	$ 41,000	Based on WRA Proposal dated 22 January 2020
3.5	15% Administrative Contingency	$ 15,000	15% of Total Administrative Costs
	Administration Subtotal	**$ 109,000**	
	GRAND TOTAL	**$ 639,000**	

[7] All costs rounded to the nearest thousand dollars.

8. REFERENCES

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Appendix A

Topographic and Boundary Survey Base Maps

January 2020

O'Dell Engineering

ABBREVIATIONS

AC	ASPHALT CONCRETE
BOW	BACK OF WALK
CONC	CONCRETE
CR	CROWN
EP	EDGE OF PAVEMENT
FD	FOUND
FL	FLOWLINE
FM	METAL/WIRE FENCE
FW	WOOD FENCE
HP	HINGE POINT
LIP	LIP OF GUTTER
SMH	SEWER MANHOLE
SWL	STRIPING-SOLID WHITE LINE
TC	TOP OF CURB
TOE	TOE OF SLOPE
TRANS	TRANSFORMER
USA	UNDERGROUND SERVICE ALERT
WMA	MASONRY WALL
WV	WATER VALVE

LEGEND

BACKFLOW PREVENTER
BENCHMARK
BOLLARD
CLEAN OUT
CONTOUR (45)
CURB
DOOR
DRAIN INLET
ELECTRIC METER/BOX
ELECTROLIER
ELEVATION W/ DESCRIPTION (40.77 EP)
NATURAL GROUND SHOT (42.9)
FIRE HYDRANT
FOUND MONUMENT
FOUND MONUMENT IN WELL
GUY WIRE
IRRIGATION VALVE (IRR)
SANITARY SEWER MANHOLE (S)
SIGN
STREET/SITE LIGHT PULL BOX (S)
TREES
UNDERGROUND UTILITY LINE LABEL AND DIRECTION (6" SS)
UTILITY POLE
WALL
WATER METER/BOX (W)
WATER VALVE (WV)

BOUNDARY LINES
- ADJACENT PROPERTY LINE
- CENTER LINE
- EASEMENT LINE
- PROPERTY LINE
- RIGHT OF WAY LINE

HARDSCAPE LINES
- BACK OF CURB
- FACE OF CURB
- FLOWLINE
- LIP OF GUTTER
- SIDEWALK/CONCRETE

MISCELLANEOUS LINES
- BUILDING OUTLINE
- FENCE, CHAIN-LINK
- FENCE, METAL (HEIGHT NOTED)
- FENCE, WOOD (HEIGHT NOTED)

UTILITY LINES
- GAS LINE
- OVERHEAD
- SANITARY SEWER
- WATER

SURVEY CONTROL:

HORIZONTAL DATUM
NORTH AMERICAN DATUM OF 1983 (NAD83).

COORDINATE SYSTEM
COORDINATES SHOWN HEREON ARE GROUND AND BASED ON THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), ZONE III.

VERTICAL DATUM
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

PROJECT BENCHMARK (NGS BM DESINATION F 1239)
BENCH MARK DISK SET IN A RETAINING WALL OR CONCRETE LEDGE OF CULVERT HEADWALL AT THE SOUTHEAST CORNER OF THE JUNCTION OF STATE HIGHWAY 1 AND KELLY AVENUE, IN THE TOP AND 0.9 FOOT NORTH OF THE SOUTH END OF THE EAST CONCRETE HEADWALL OF 24 INCH PIPE CULVERT ⌀, 31 FEET EAST FO THE CENTER LINE OF THE AVENUE, 7 FEET NORTH OF STEEL LIGHT POLE "D 3036" AND ABOUT 1/2 FOOT LOWER THEN THE HIGHWAY.
ELEVATION = 62.78' (NAVD 88)

LOCAL BM
PT 15951 BEING MAG NAIL SET IN AC APPROXIMATELY 237' NORTHWEST ALONG OAK AVENUE FROM THE INTERSECTION WITH PILARCITOS AVENUE, 18' NORTH OF A POWER POLE.
ELEVATION = 40.53' (NAVD 88)

BASIS OF BEARINGS
THE BEARING BETWEEN POINTS 15951 TO 15953 BEING N 21° 49'10" W.

CONTROL POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
15951	1998663.97	5999899.24	SET GCP
15952	1998971.41	5999787.74	SET GCP
15953	1999195.00	5999686.63	SET GCP
15954	1999107.95	5999613.01	SET GCP

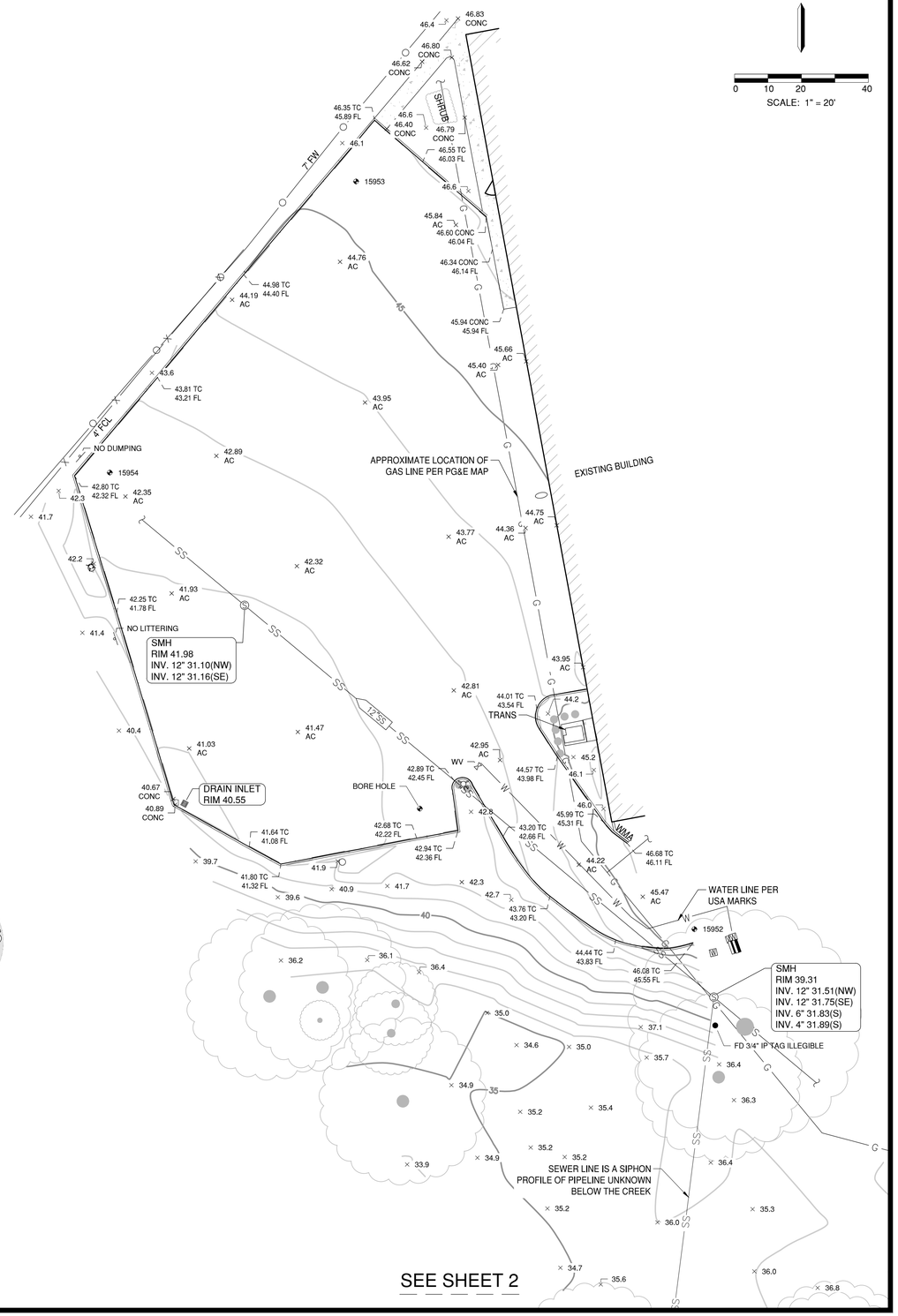
UTILITY NOTES:

PHYSICAL ITEMS SHOWN ON THIS SURVEY ARE LIMITED TO THOSE SURFACE ITEMS VISIBLE AS OF THE DATE OF THIS SURVEY. SUBSURFACE OBJECTS, IF ANY, ARE NOT SHOWN, WITH THE EXCEPTION OF UNDERGROUND UTILITY LINES. NO WARRANTY IS IMPLIED AS TO THE EXACT LOCATION OF THESE LINES OR AS TO THE COMPLETENESS OF THE UTILITY INFORMATION SHOWN HEREON. SAID SUBSURFACE OBJECTS MAY INCLUDE, BUT ARE NOT LIMITED TO, CONCRETE FOOTINGS, SLABS, SHORING, STRUCTURAL PILES, UTILITY VAULTS, PIPING, UNDERGROUND TANKS, ADDITIONAL UNDERGROUND UTILITY LINES, TELECOMMUNICATION LINES, FIBER OPTIC LINES AND ANY OTHER SUBSURFACE STRUCTURES OR FACILITIES NOT REVEALED BY A SURFACE INSPECTION ON THE DATE THAT THE FIELD WORK FOR THIS SURVEY WAS PERFORMED. FIELD WORK WAS PERFORMED ON SEPTEMBER 26 AND OCTOBER 10, 2019.

CALL BEFORE YOU DIG USA 800-227-2600

MONUMENTATION NOTE:

PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ON THIS SITE, IT IS ADVISED THAT ALL INVOLVED PARTIES REVIEW SECTION 8771 AND SECTION 8725 OF THE BUSINESS AND PROFESSIONS CODE AND SECTION 605 OF THE CALIFORNIA PENAL CODE TO ENSURE THAT MONUMENT CONSERVATION HAS BEEN PROPERLY ADDRESSED.



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

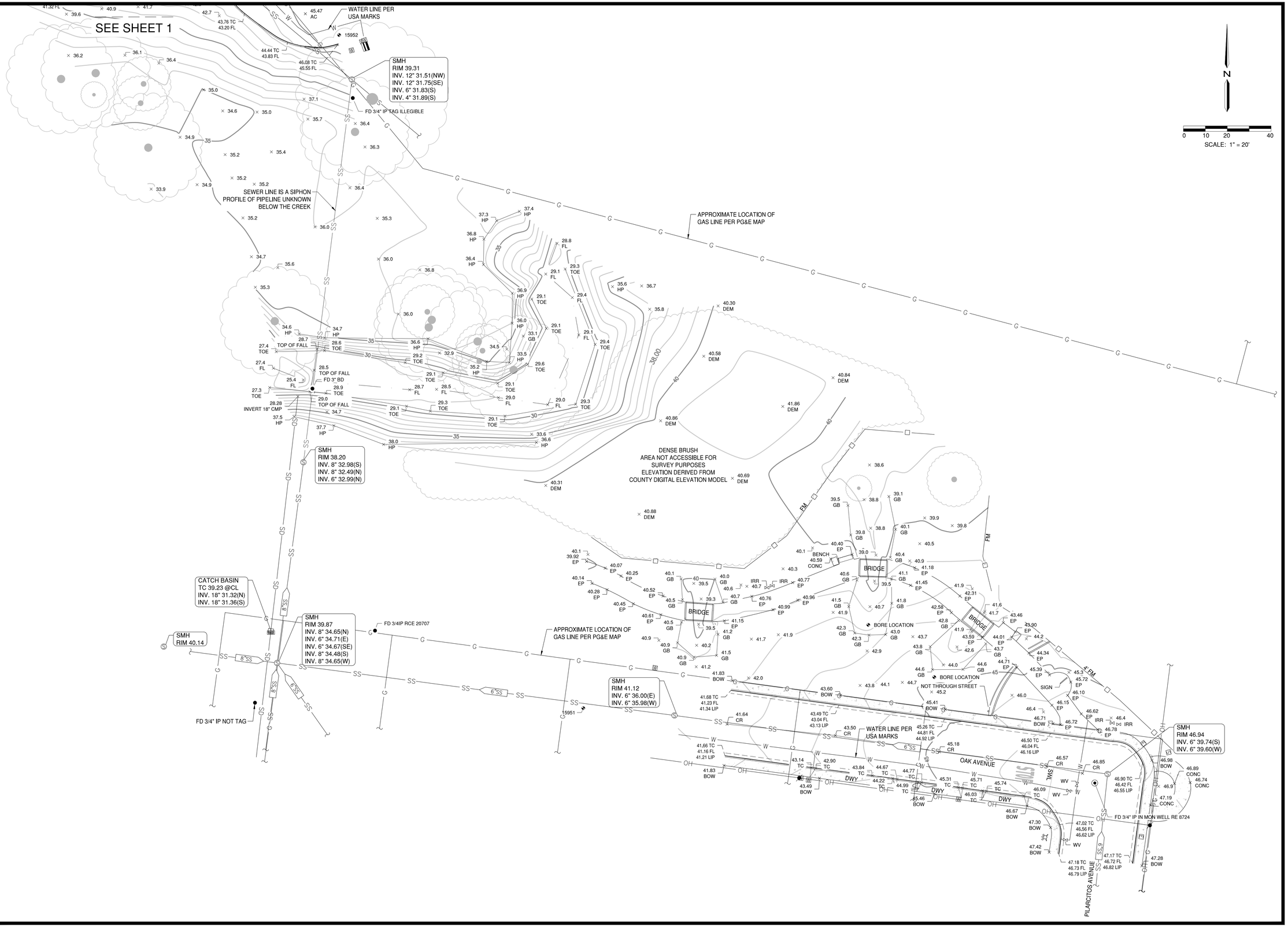
TOPOGRAPHIC SURVEY
PILARCITOS CREEK
PHASE OF PROJECT
HALF MOON BAY, CALIFORNIA

TOPO

APPROVED:

DESIGNED:	
DRAWN:	BG
CHECKED:	SP
SCALE:	1"=20'
DATE:	10/31/2019
JOB NO.:	37011
FILE NO.:	37011-TP.DWG

SHEET NO.
1
OF
2



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

TOPOGRAPHIC SURVEY
PILARCITOS CREEK
HALF MOON BAY, CALIFORNIA

TOPO

APPROVED:

DESIGNED:	
DRAWN:	BG
CHECKED:	SP
SCALE:	1"=20'
DATE:	10/31/2019
JOB NO.:	37011
FILE NO.:	37011-TP.DWG

SHEET NO.
2
OF
2

EXHIBIT 1
BOUNDARY SURVEY WITH UTILITY EASEMENTS
BY O'DELL ENGINEERING
SENT ON 1/27/2020

SCALE: 1"=30'

EASEMENT NOTES:

1. EASEMENT FOR ELECTRIC TRANSMISSION LINE RECORDED 2/6/1936 BK 677 PG 177 - NOT LOCATABLE FROM RECORD.
2. EASEMENT FOR WATER MAIN RECORDED 8/1/1963 BK 4515 PG 643 - NOT LOCATABLE FROM RECORD.
3. EASEMENT FOR CREEK SIDE TRAIL RECORDED 3/18/1992 INST NO. 92038184 - NOT LOCATABLE FROM RECORD.

SFN
PER 9LL56

1052
SFN /1.5FT TO NORTH

SFN
PER 9LL56

9059
SFN

FD 3/4" IP TAG ILLEG
ACCEPTED AS 0.58' OFFSET MONUMENT
TO CORNER PER 9LL56

1053
49.161
FD 3/4" IP TAG NOT LEGIBLE

LOT 3

LOT A

LOT 4

10' GAS AND ELECT. EASEMENT
PER INST NO 84124834
REC NOV. 20, 1984

PARCEL3 PER TITLE REPORT
ORDER NO. 55914-1664750-19
NON-EXCLUSIVE EASEMENT FOR
ACCESS AND UTILITY PURPOSES
OVER LOT 2

LOT 1

LOT 2

LLA RECORDED 5/11/1984
DOC NO 84051211
AS SHOWN ON ROS BK 9 LLS PG 56

FD 6x6 CONC MON WITH SCRIBED X
DOES NOT FIT RECORD MEASUREMENTS
PER 59PM12

FD 3/4" IP TAG ILLEG
HELD FOR LINE
DISTANCE BETWEEN MONUMENTS
IS 1.60' LESS THEN RECORD
PER 59PM12

1050
52.894
FD 3/4" IP TAG NOT LEGIBLE

1054
53.399
FD CONC MON W/ SCRIBED X

10' GAS AND ELECT. EASEMENT
PER INST NO 85016036
REC FEB. 20, 1985

LOT 5
PARCEL 1 PER TITLE REPORT
ORDER NO. 55914-1664750-19

MATCH LINE SEE PAGE 2

MATCH LINE SEE PAGE 1

EXHIBIT 1
BOUNDARY SURVEY WITH UTILITY EASEMENTS
BY O'DELL ENGINEERING
SENT ON 1/27/2020

0 15 30 60 90
SCALE: 1"=30'

EASEMENT NOTES:

1. EASEMENT FOR ELECTRIC TRANSMISSION LINE RECORDED 2/6/1936 BK 677 PG 177 - NOT LOCATABLE FROM RECORD.
2. EASEMENT FOR WATER MAIN RECORDED 8/1/1963 BK 4515 PG 643 - NOT LOCATABLE FROM RECORD.
3. EASEMENT FOR CREEK SIDE TRAIL RECORDED 3/18/1992 INST NO. 92038184 - NOT LOCATABLE FROM RECORD.

20' WATER EASEMENT
PER INST NO 84051212
REC MAY 11, 1984

APN 056-300-150

20' WATER EASEMENT
PER INST NO 84051212
REC MAY 11, 1984

10' SEWER EASEMENT
PER BK 4902 PG 57
REC FEB 25, 1965

FD X
NOT ACCEPTED AS CORNER PER 9LL56

1023
12.038
FD 3/4 IP

SFN
PER 9LL56

10' SEWER EASEMENT
PER BK 4902 PG 57
REC FEB 25, 1965

10' GAS AND ELECT. EASEMENT
PER INST NO 85004530
REC JAN. 15, 1985

10' GAS AND ELECT. EASEMENT
PER INST NO 84124834
REC NOV. 20, 1984

SFN
PER 9LL56

1024
SFN

10' GAS AND ELECT. EASEMENT
PER INST NO 85016036
REC FEB. 20, 1985

1022
37.286
FD 3/4" IP TAG ILLEGIBLE

FD 3/4" IP TAG ILLEG
"RC? ???8"
ACCEPTED AS CORNER PER 9LL56

APN 056-300-210

NORTH LINE PARCEL 1
PER TITLE REPORT
DESCRIBED AS CL OF
PILARCITOS CREEK
1989 CL OF PILARCITOS CREEK

SFN
PER 9LL56

9034
SFN /4FT TO WEST

SFN
PER 9LL56

1025
SFN

10' SEWER EASEMENT
PER BK 4902 PG 57
REC FEB 25, 1965

APN 056-040-999

15' PUE
PER 90RSM09

EAST LINE LOT 28
ASSESSOR LINE

PARCEL APPEARS TO BE
EXCLUDED FROM ALL TITLE REPORT
DESCRIPTIONS. THIS PARCEL IS NOT
ACCOUNTED FOR WITH AN APN NUMBER

2' EASEMENT ELECT. WIRES
AND PIPELINES
PER INST NO 92574
BK 41 PG 200
REC JUNE 1, 1922

EASEMENT FOR PARKING
PER INST NO 84051215
REC MAY 11, 1984

10' GAS AND ELECT. EASEMENT
PER INST NO 84124834
REC NOV. 20, 1984

PARCEL 1

1055
49.705
FD 3/4 IP IN WALK NO TAG

FD 3/4" IP TAG ILLEG
"LS 357?"
ACCEPTED AS CORNER PER 59PM12

1054
37.697
FD 3/4" IP TAG NOT LEGIBLE

FD 3/4" IP NO TAG FLUSH IN CONC
PER 59PM12

PARCEL 2

COMMON AREA LOT 2
BK 90 RSM PG 09

1000
×29.947
FD 3/4 BD

APN 056-040-998

APN 056-141-970

EAST LINE LOT 26
ASSESSOR LINE

PARCEL 1 PER TITLE REPORT
ORDER NO. 55914-1664743-19

NOT ACCESSIBLE
PER 9LL56

APN 056-300-170

PARCEL2 PER TITLE REPORT
ORDER NO. 55914-1664750-19
50' NON-EXCLUSIVE EASEMENT FOR
INGRESS AND EGRESS

BK 90 RSM PG 09
PUBLIC RIGHT OF WAY

FD 3/4" IP TAG "RCE 20707"
PER CR#1497A
ACCEPTED AS CORNER PER 90-MAPS-09

9029
SFN

SFN
PER 90-MAPS-09

1028
39.917
FD 3/4IP RCE 20707

APN 056-141-960

APN 056-300-220

BK 59 PM PG 12

3030
39.694
8FT TO PL FD 3/4" IP NO TAG

2030
× 39.767
5FT TO PL FD 3/4" IP NO TAG

5FT TO PL FD 3/4" IP NO TAG

FD 3/4" IP NO TAG
ACCEPTED AS CORNER PER 90-MAPS-09

OAK AVE

APN 056-141-950

SNF
PER 59PM12

2056
SFN

1031
× 45.978
FD 3/4" IP IN MON WELL CASE

PARCEL 2 PER TITLE REPORT
ORDER NO. 55914-1664743-19

APPROXIMATE LOCATION
16' SANITARY SEWER EASEMENT
DOC NO 4275-AT
PER 59-PM-012
EXACT LOCATION COULD NOT BE
DETERMINED FROM RECORD

FD 3/4" IP "RE 8724"
IN WELL
PER 90-MAPS-09

BK 3 RSM PG 94
PILARCITOS PARK

PILARCITOS AVE

SNF
PER 59PM12

2057
SFN

PAGE 2/2

EXHIBIT 2
BOUNDARY SURVEY WITH CONSERVATION EASEMENT

BY O'DELL ENGINEERING
SENT ON 1/27/2020

0 15 30 60 90
SCALE: 1"=30'

N

EASEMENT NOTES:

1. EASEMENT FOR ELECTRIC TRANSMISSION LINE RECORDED 2/6/1936 BK 677 PG 177 - NOT LOCATABLE FROM RECORD.
2. EASEMENT FOR WATER MAIN RECORDED 8/1/1963 BK 4515 PG 643 - NOT LOCATABLE FROM RECORD.
3. EASEMENT FOR CREEK SIDE TRAIL RECORDED 3/18/1992 INST NO. 92038184 - NOT LOCATABLE FROM RECORD.

11
12
13

LOT 5
PARCEL 1 PER TITLE REPORT
ORDER NO. 55914-1664750-19

APN 056-300-150

FD X
NOT ACCEPTED AS CORNER PER 9LL56

AREA OF PERMITTED ENCROACHMENTS PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

RIPARIAN CORRIDOR BUILDING SETBACK PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

RIPARIAN LINE PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

NOT ACCESSIBLE DUE TO VEGETATION PER 9LL56

1023
× 27.266
FD 3/4" IP TAG ILLEGIBLE

FD 3/4" IP TAG ILLEG
"RC? ???8"
ACCEPTED AS CORNER PER 9LL56

APN 056-300-210

1023
× 28.238
SFN

SFN
PER 9LL56

NORTH LINE PARCEL 1
PER TITLE REPORT
DESCRIBED AS CL OF
PILARCITOS CREEK
1989 CL OF PILARCITOS CREEK

9024
SFN

SFN
PER 9LL56

9024
× 29.41
SFN 4PLUG WASH

SFN
PER 9LL56

9025
SFN

PARCEL 1

EASEMENT FOR PARKING
PER INST NO 84051215
REC MAY 11, 1984

FD 3/4" IP TAG ILLEG
"LS 35??"
ACCEPTED AS CORNER PER 59PM12

1035
43.697
FD 3/4" IP TAG NOT LEGIBLE

APN 056-040-999

EAST LINE LOT 28
ASSESSOR LINE

AREA OF PERMITTED ENCROACHMENTS PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

PARCEL 2

COMMON AREA LOT 2
BK 90 RSM PG 09

1001
× 29.347
FD 3" BD

PARCEL APPEARS TO BE EXCLUDED FROM ALL TITLE REPORT DESCRIPTIONS. THIS PARCEL IS NOT ACCOUNTED FOR WITH AN APN NUMBER

RIPARIAN CORRIDOR BUILDING SETBACK PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

APN 056-040-998

APN 056-141-970

EAST LINE LOT 26
ASSESSOR LINE

NOT ACCESSIBLE
PER 9LL56

RIPARIAN LINE PER INST 84051210 ESTABLISHED BY RUBBER SHEET FROM EXHIBIT

APN 056-300-170

PARCEL 1 PER TITLE REPORT
ORDER NO. 55914-1664743-19

BK 90 RSM PG 09
PUBLIC RIGHT OF WAY

FD 3/4" IP TAG "RCE 20707"
PER CR#1497A
ACCEPTED AS CORNER PER 90-MAPS-09

APN 056-141-960

9029
SFN

SFN
PER 90-MAPS-09

1028
39.917
FD 3/4IP RCE 20707

APN 056-300-220

BK 59 PM PG 12

PARCEL2 PER TITLE REPORT
ORDER NO. 55914-1664750-19
50' NON-EXCLUSIVE EASEMENT FOR INGRESS AND EGRESS

3030
39.694
8FT TO PL FD 3/4" IP NO TAG

2030
× 39.767
5FT TO PL FD 3/4" IP NO TAG

3030
5FT TO PL FD 3/4" IP NO TAG

FD 3/4" IP NO TAG
ACCEPTED AS CORNER PER 90-MAPS-09

APN 056-141-950

OAK AVE

Appendix B

Geotechnical Investigation Proposed Pilarcitos Creek Crossing

November 20, 2019

Geo-Logic Associates

GEOTECHNICAL INVESTIGATION
PROPOSED PILARCITOS CREEK CROSSING

SAN MATEO ROAD & OAK AVENUE
HALF MOON BAY, CALIFORNIA

NOVEMBER 20, 2019
PROJECT PA18.1051.00

SUBMITTED TO:

EKI Environmental & Water
577 Airport Boulevard, Suite 500
Burlingame, CA 94010

PREPARED BY:

Geo-Logic Associates
16055 Caputo Drive, Suite D
Morgan Hill, California 95037
(408) 778-2818

GEOTECHNICAL INVESTIGATION
PROPOSED PILARCITOS CREEK CROSSING
SAN MATEO ROAD & OAK AVENUE
HALF MOON BAY, CALIFORNIA

Table of Contents

1 INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed pipeline crossing at Pilarcitos Creek, west of Highway 1 in Half Moon Bay, California. The proposed pipeline crossing alignment is referenced as the "property" in this report. The approximate location of the project site is shown on the Vicinity Map included on Figure 1. A layout of the existing site conditions, the proposed pipeline crossing alignment, and locations of our drill holes are shown on Figure 1.

This report presents our findings, conclusions, and geotechnical recommendations for design and construction of the project. These findings, conclusions, and recommendations are based on information collected and reviewed during this investigation. The conclusions and recommendations in this report should not be extrapolated to other areas or used for other projects without our review.

1.1 Project Description

The project will involve construction of a new 8-inch inside diameter (I.D.) high-density polyethylene (HDPE) pipe section across Pilarcitos Creek, between the Strawflower Shopping Center in the north and the Oak Avenue Park in the south, a distance of approximately 450 feet, using horizontal directional drilling (HDD) construction method. The HDD pit at the north end of the crossing will be located in the parking lot behind the Safeway store in the Strawflower Shopping Center. The HDD pit at the south end of the crossing will be located in the Oak Avenue Park on the north side of Oak Avenue. The pits will be about 4 to 5 feet in depth. The proposed invert of the HDPE pipe will be at least 15 feet below the creek bed.

The above project descriptions are based on information provided to us. If the actual project differs from those described above, Geo-Logic Associates (GLA) should be contacted to review our findings, conclusions, and recommendations and present any necessary modifications to address the different project development schemes.

1.2 Information Provided

For this investigation, we were provided with the following.

- A drawing titled 'Conceptual Horizontal Directional Drilling (HDD) Alignment, Construction Staging Areas, and Easements," dated September 2019, prepared by EKI Environment and Water.

- Topographic Survey, Pilarcitos Creek, Sheets 1 and 2, dated October 31, 2019, prepared by O'Dell Engineering.

- Project information.

1.3 Purpose and Scope of Services

The purpose of this geotechnical investigation was to explore subsurface conditions in the area of the proposed HDD pits and to provide geotechnical recommendations for design and construction of the proposed improvements. The following work was performed.

1. Performed a site reconnaissance to observe site surface conditions and to mark locations of our exploration.

2. Reviewed available geologic and geotechnical information pertinent to the site.

3. Obtained a drilling permit from San Mateo County Environmental Health Services (SMCEHS).

4. Notified Underground Service Alert (USA) for underground utility clearance.

5. Coordinated our drilling with our client.

6. Subcontracted with a private underground locator to check the proposed exploration locations for presence of underground utilities.

7. Explored subsurface conditions by means of two exploratory drill holes to a depth of approximately 50 feet below ground surface.

8. Performed laboratory tests on selected soil samples from the drill holes to measure pertinent engineering properties of the samples.

9. Performed engineering analysis on the field and laboratory data.

10. Prepared this geotechnical investigation report.

2 SITE INVESTIGATION

This investigation consists of a site reconnaissance and a subsurface exploration program. The site reconnaissance was to observe existing site surface conditions. The subsurface exploration program was to explore earth conditions at the project site. The observed surface and subsurface site conditions are discussed in Section 3 of this report.

2.1 Subsurface Exploration

Our subsurface exploration program involved drilling of two exploratory drill holes (DH-1 and DH-2) on September 27, 2019. The exploratory drill holes were located in the field by referencing to existing site features and pacing; therefore, their locations are approximate. The approximate locations of the drill holes are shown on Figure 1.

The two exploratory drill holes were advanced using a truck-mounted Mobile B-53R drilling rig equipped with 8-inch diameter hollow-stem augers. The depth of exploration was approximately 50 feet below ground surface (bgs). In the field, our personnel visually classified the materials encountered and maintained a log of each drill hole.

Soil samples were obtained using a 2-inch outside diameter (O.D.; 1.4-inch inside diameter, I.D.) split-barrel sampler (also called a Standard Penetration Test sampler) and a 3-inch O.D. (2½-inch I.D.) split-barrel sampler. Soil samples were obtained by driving the sampler up to 18 inches into the earth material using a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler was recorded for each 6-inch penetration interval. The number of blows required to drive the sampler the last 12 inches, or the penetration interval indicated on the log when harder material was encountered, is shown as blows per foot (blow count) on the drill hole logs.

In the field, our personnel visually classified the materials encountered and maintained a log of each drill hole. Visual classification of soils encountered in our drill holes was made in general accordance with the Unified Soil Classification System (ASTM D 2487 and D 2488). The results of our laboratory tests were used to refine our field classifications. Two Keys to Soil Classification, one for fine grained soils and one for coarse grained soils, are included in Appendix A, together with the logs of the drill holes.

2.2 Laboratory Testing

Geotechnical laboratory testing was conducted on selected soil samples collected from our drill holes. These tests included moisture content, dry density, grain size analysis, and percentage passing a No. 200 sieve. The laboratory test results are presented on the drill hole logs at the corresponding sample depths. The results of the grain size analysis tests are presented in Appendix B.

3 FINDINGS

3.1 Surface Conditions

The proposed pipeline crossing is approximately 450 feet in length and extends between the parking lot behind the Safeway store in the Strawflower Shopping Center on the north side of Pilarcitos Creek and the Oak Avenue Park on the south side of Pilarcitos Creek.

The parking lot behind Safeway is off of San Mateo Road and west of Highway 1. The asphalt concrete surface across the parking lot is essentially flat-lying.

Oak Avenue Park is in a residential neighborhood with generally flat-lying topography. The park has grass fields, a restroom building, asphalt concrete trails, picnic and play areas, and several pedestrian wood bridges.

Based on the topographic survey maps provided to us, the existing ground surface is at approximately elevation 42½ feet in the area of our DH-1 and approximately elevation 40 feet in the area of our DH-2. The flowline in the creek is between roughly elevation 27 and 29 feet. Both creek banks are covered with heavy vegetation.

3.2 Subsurface Conditions

Subsurface soils encountered in our two drill holes consist generally of alluvial fan and stream terrace deposits according to the geologic map "Offshore and Onshore Geology and Geomorphology, Offshore of Half Moon Bay Map Area, California," prepared by United States Geological Survey, 2014.

In drill hole DH-1, the subsurface soils consist of very stiff to hard clay with sand to sandy clay to a depth of about 12 feet below ground surface (bgs), underlain by medium dense clayey sand to a depth of about 20 feet bgs. This sand is underlain by stiff lean clay to clayey silt to a depth of about 24½ feet bgs, and medium dense to dense clayey sand to very stiff sandy lean clay to a depth of about 27½ feet bgs. Below, alternating layers of stiff clay and dense to very dense clayey sand and clayey sand with gravel were encountered to the maximum explored depth of 50 feet bgs.

In drill hole DH-2, the subsurface soils consist of very stiff to hard clay to a depth of about 9½ feet bgs, underlain by alternating layers of medium dense clayey sand and stiff to very stiff sandy clay and clay to a depth of about 22 feet bgs. These soils are underlain by medium dense to very dense clayey sand and clayey sand with gravel to the maximum explored depth of 50 feet bgs.

3.3 Groundwater

Groundwater was encountered at a depth of approximately 18½ and 18 feet bgs in our drill

holes DH-1 and DH-2, respectively. These depths correspond to an elevation of roughly 24 feet in DH-1 and roughly 22 feet in DH-2.

It should be noted that fluctuations in the groundwater level may occur due to seasonal variations in rainfall and temperature, pumping from wells, regional groundwater recharge program, irrigation, or other factors that were not evident at the time of our investigation. We expect groundwater and water level in Pilarcitos Creek is closely related.

3.4 Variations in Subsurface Conditions

Our interpretations of soil and groundwater conditions, as described in this report, are based on information obtained from drill holes and laboratory testing for this study. Our conclusions and recommendations are based on these interpretations. Please realize the site has undergone different phases of development and grading. Therefore, it is likely that undisclosed variations in subsurface conditions exist at the site, such as old foundations, abandoned utilities, and localized areas of deep and loose fill.

Careful observations should be made during construction to verify our interpretations. Should variations from our interpretations be found, we should be notified to evaluate whether any revisions should be made to our recommendations.

4 SEISMIC CONSIDERATIONS

4.1 Earthquake Faulting

The Greater San Francisco Bay Area is seismically dominated by the active San Andreas Fault system, the tectonic boundary between the northward moving Pacific Plate (west of the fault) and the North American Plate (east of the fault). This movement is distributed across a complex system of generally strike-slip, right-lateral, and subparallel faults.

Potential sources of significant earthquake ground shaking at the site include several active and potentially active faults in the San Francisco Bay area, as well as faults farther afield. The faults were first compiled on the State's Fault Activity Map (Jennings, 1974; Jennings and Bryant, 2010). This map has now been integrated into the US Geological Survey's Quaternary Fault and Fold Database and made available as a .kmz "drape" over Google Earth terrain files.

The distance to a seismic source (fault) is defined by the NGA relationships as the closest distance to the seismogenic zone, be it in the subsurface or at the surface; distances may therefore differ from distances measured on the ground surface. The distances shown on the table below are for reference only, as they are horizontal distances from the site to the surface trace of the seismic source, and not necessarily the closest distance to a (dipping) seismogenic zone. These distances were measured using the US Geological Survey's Quaternary Fault and Fold Database, with major faults listed in approximate order of distance from the site; not all sources are listed in the summary table below.

Fault Name	Approximate Distance	Orientation from Site
San Gregorio	3 km	Southwest
Pilarcitos	6¼ km	Northeast
San Andreas	8¾ km	Northeast
Sierra	12½ km	Northeast
Pulgas	17½ km	Southeast
Stanford	17 km	Southeast

4.2 Ground Accelerations

According to the California Building Code (CBC) and American Society of Civil Engineers (ASCE) Standard 7, the spectral response acceleration at any period can be taken as the lesser of the spectral response accelerations from the probabilistic and deterministic ground motion approaches. The U.S. Seismic Design Maps tool available at the Structural Engineers Association of California (SEAOC) website was used for this purpose to retrieve seismic design parameter values for design of buildings at the subject site. Two levels of ground motions are considered in the Application: Risk-targeted Maximum Considered Earthquake (MCER) and Design Earthquake (DE), with both probabilistic and deterministic values defined in terms of maximum-direction rather than geometric-mean, horizontal spectral acceleration. The

probabilistic MCER spectral response accelerations are represented by a 5 percent damped acceleration response spectrum having a 1 percent probability of collapse within a 50-year period and in the direction of the maximum horizontal response. The probabilistic Design Earthquake (DE) Sa value at any period can be taken as two-thirds of the MCER Sa value at the same period.

Using the Seismic Design Maps application at the SEAOC website, a site Class D, and the latitude and longitude of the site (latitude 37.46886º N, longitude -121.43653º W), the calculated geometric mean peak ground accelerations adjusted for site class effects (PGAM) for the MCEG (Geometric Mean Maximum Considered Earthquake) are presented below.

2016 California Building Code, ASCE 7-10	2019 California Building Code, ASCE 7-16
0.792g	0.859g

4.3 Seismicity

The Working Group on California Earthquake Probabilities' (WGCEP) estimates of the probabilities of major earthquakes are now in their sixth iteration, with the greatest changes in approach being the inclusion of multifold rupture scenarios, in the progressive consideration of more potential seismic sources, the possibility of earthquakes on unrecognized faults, and the inclusion of the notion of fault "readiness". Current estimates (WGCEP, 2014) for the San Francisco region indicate a 72% probability of a large (magnitude 6.7 or greater) earthquake in the San Francisco Bay area as a whole over the 30-year period beginning in 2014; this overall probability is greater than the previous (WGCEP, 2007) probability of 63%, due mainly to the inclusion of multi-fault rupture scenarios. The estimate for the Calaveras fault alone is 14.4% (revised up from the 7% presented by WGCEP, 2007); for the (northern) San Andreas fault alone, 27.4% (revised upward from the WGCEP (2007) value of 21%); and for the Hayward fault, 45.3% (revised upward from the WGCEP (2007) value of 31%).

4.4 Liquefaction

Soil liquefaction is a phenomenon in which saturated granular soils, and certain fine-grained soils, lose their strength due to the build-up of excess pore water pressure during cyclic loading, such as that induced by earthquakes. Soils most susceptible to liquefaction are saturated, clean, loose, fine-grained sands and non-plastic silts. Certain gravels, plastic silts, and clays are also susceptible to liquefaction. The primary factors affecting soil liquefaction include: 1) intensity and duration of seismic shaking; 2) soil type; 3) relative density of granular soils; 4) moisture content and plasticity of fine-grained soils; 5) overburden pressure; and 6) depth to ground water.

Our review of the Association of Bay Area Governments Resilience Program Liquefaction Hazard Zone map for the project site (Association of Bay Area Governments Resilience Program, August 7, 2018) indicates the site is in a liquefaction hazard zone.

A liquefaction analysis was performed based on subsurface information from our drill holes DH-1 and DH-2, a peak ground acceleration of 0.79g, earthquake magnitude of 8.1, and groundwater level of 18 feet bgs. The results of our analysis suggest the sand layer in DH-1 between depths of roughly 31 and 34½ feet and the sand layer in DH-2 between depths of roughly 22 and 27 feet are susceptible to liquefaction. The estimated liquefaction-induced settlement is 1 inch or less.

5 CONCLUSIONS AND DISCUSSION

Based on our geotechnical evaluation, it is our opinion the project site may be considered for construction of the proposed pipeline crossing provided our geotechnical opinions, conclusions, and recommendations are incorporated in the design and construction of the project. Our opinions, conclusions, and recommendations are based on our understanding of the proposed development, data review, properties of soils encountered in our subsurface exploration, laboratory test results, and engineering analyses. Geotechnical considerations for this project are discussed below.

5.1 Ground Rupture

The project site is not located in an Alquist-Priolo Earthquake Fault Zone. Because no active or potentially active faults are known to cross the site, the risk of fault rupture through the project site is low.

5.2 Seismic Shaking

The project site is located in an area of high seismicity. Based on general knowledge of the site seismicity, it should be anticipated that, during their useful life, the proposed improvements will be subject to at least one severe earthquake (magnitude 7 to 8+) that could cause considerable ground shaking at the site. It is also anticipated that the site will periodically experience small to moderate magnitude earthquakes.

5.3 Groundwater and Granular Soils

Groundwater was encountered at a depth of about 18 feet bgs at the time of our subsurface exploration. Groundwater is expected to be affected by water level in the adjacent Pilarcitos Creek and will fluctuate between the wet winter months and the dry summer months. As currently planned, the proposed HDD pits will be about 4 to 5 feet in depth; therefore, they should be above the groundwater level. However, the pipeline will be installed below groundwater level and through sandy soils. The HDD designer and contractor should consider the presence of groundwater and granular soils in their design and construction.

6 GEOTECHNICAL RECOMMENDATIONS

6.1 Site Preparation, Clearing and Stripping

Prior to grading, construction areas should be cleared of obstructions and deleterious materials which may include designated structures, utility lines, trees and roots, and other below grade obstacles encountered during the clearing operation. Depressions, excavations, and holes that extend below the planned finish grades should be cleaned and backfilled with engineered fill compacted to the requirements given under the section of "Engineered Fill Placement and Compaction."

6.2 Excavation, Temporary Construction Slopes, and Shoring

Temporary excavations will be required for the HDD pits (about 4 to 5 feet in depth). The upper soils at both HDD pit locations are generally clays. The walls of excavations in clayey soils and less than 5 feet in height should be able to stand near vertical with proper bracing, provided proper moisture content in the soils is maintained. Excavations and temporary construction slopes should be constructed in accordance with the current OSHA safety standards and local jurisdiction. The stability and safety of excavations, braced or unbraced, is the responsibility of the contractor. Care should be exercised when excavating in the proximity of existing structures and improvements.

Contractors are responsible for the design, installation, maintenance, and removal of all required temporary shoring and bracing systems. The presence of existing structures, pavements, and underground utilities must be incorporated in the design of the shoring and bracing systems.

Trench excavations adjacent to existing or proposed foundations should be above an imaginary plane having an inclination of 1½:1 (horizontal to vertical) extending down from the bottom edge of the foundations.

6.3 Horizontal Directional Drilling (HDD)

HDD is typically a three-phase process. The first phase involves drilling a pilot hole from the entry pit to the receiving pit along the proposed pipeline alignment. The second phase involves enlarging the pilot hole with reaming equipment to the desired diameter, typically 1.5 times the pipe diameter. A reamer tool replaces the drill bit and is pulled back by the HDD machine to expand the pilot hole. The third phase involves pulling back the product pipe attached to the reamer through the enlarged hole from the receiving pit to the entry pit. Drilling mud, typically a mixture of water and bentonite or polymer, is used to remove the soil cuttings and support the walls of the hole. HDD is applicable to most soil conditions but will experience difficulty where cobbles and boulders are encountered.

Subsurface soils encountered in our drill holes consist of stiff to hard clays and medium dense

to very dense sands. Groundwater was encountered at about 18 feet bgs.

In general, clay soils have a low potential for caving but sand and gravel soils have a higher potential for caving. The sandy soils may vary from a few feet to over 8 feet thick, and contain gravel. In DH-1, the upper approximately 12 feet consist of clay, underlain by layers of clays and clayey sands. In DH-2, the upper approximately 10 feet consist of clay, underlain by layers of clays and clayey sands to about 22 feet and clayey sands from 22 to 50 feet. Significant cobbles and boulders were not encountered in our borings. The contractor should, however, be aware that high blow counts were measured in the deeper sandy soils.

Drilling fluid should be used during the drilling and back-reaming operations. The viscosity and density of the drilling fluid should be appropriate for the different soil conditions anticipated at the project site, including clayey sands and clays as encountered in our drill holes.

6.4 Backfilling of the Entry and Receiving Pits

The entry and receiving pits may be backfilled with the excavated on-site soil or approved import soil. After removal of equipment, the bottom of the pits should be compacted to at least 90 percent relative compaction at a soil water content of 2 to 4 percent above the laboratory optimum value. After the subgrade has been compacted, the pits may be raised to finish grade with placement of engineered fill. In the parking lot area, the pavement section should be replaced in kind.

Moisture conditioning of subgrade soils for compaction should consist of adding water if the soils are too dry and allowing the soils to dry if the soils are too wet. Where encountered, unstable, wet or soft soil will require processing before compaction can be achieved. If construction schedule does not allow for air-drying, other means such as lime or cement treatment of the soil or excavation and replacement with suitable material may be considered. Geotextile fabrics may also be used to help stabilize the subgrade. The method to be used should be determined at the time of construction based on the actual site conditions. We recommend obtaining unit prices for subgrade stabilization during the construction bid process.

If import fill is necessary to backfill the pits, the fill material should not contain rocks or lumps larger than 3 inches in greatest dimension, should not contain more than 15 percent of the material larger than 1½ inches, and should contain at least 20 percent passing the No. 200 sieve. In addition to these requirements, import fill should have a low expansion potential as indicated by Plasticity Index of 15 or less (per ASTM D4318), or Expansion Index of less than 20 (per ASTM D4829).

All fills should be approved by the project Geotechnical Engineer prior to delivery to the site. At least 5 working days prior to importing to the site, a representative sample of the proposed import fill should be delivered to our laboratory for evaluation. Import fills should be tested and approved for residential use per the California Department of Toxic Substances Control (DTSC) guidelines.

Engineered fill should be placed in horizontal lifts each not exceeding 8 inches in thickness, moisture conditioned to the required moisture content, and mechanically compacted to the recommendations below. Relative compaction or compaction is defined as the in-place dry density of the compacted soil divided by the laboratory maximum dry density as determined by ASTM Test Method D1557, latest edition, expressed as a percentage. Moisture conditioning of soils should consist of adding water to the soils if they are too dry and allowing the soils to dry if they are too wet.

Engineered fills consisting of on-site or imported soils should be compacted to at least 90 percent relative compaction with moisture content between about 1 and 3 percent above the laboratory optimum value. In pavement areas, the upper 8 inches of soil below the pavement section should be compacted to a minimum of 95 percent relative compaction. Aggregate base in vehicle pavement areas should be compacted at slightly above the optimum moisture content to a minimum of 95 percent relative compaction.

6.5 Wet Weather Construction

If construction is to be performed during the winter rainy months, the owner and contractors should be fully aware of the potential impact of wet weather. Rainstorms can cause delay to construction and damage to previously completed work by saturating compacted pads or subgrades, or flooding excavations.

Earthwork during rainy months will require extra effort and caution by the contractors. The contractors are responsible for protecting their work to avoid damage by rainwater. Standing pools of water should be pumped out immediately. Construction during wet weather conditions should be addressed in the project construction bid documents and/or specifications. We recommend the contractors submit a wet weather construction plan outlining procedures they will employ to protect their work and to minimize damage to their work by rainstorms.

7 PLAN REVIEW, EARTHWORK AND FOUNDATION OBSERVATION

Post-report geotechnical services by Geo-Logic Associates (GLA), typically consisting of pre-construction design consultations and reviews and construction observation and testing services, are necessary for GLA to confirm the recommendations contained in this report. This report is based on limited sampling and investigation, and by those constraints may not have discovered local anomalies or other varying conditions that may exist on the project site. Therefore, this report is only preliminary until GLA can confirm that actual conditions in the ground conform to those anticipated in the report. Accordingly, as an integral part of this report, GLA recommends post-report, construction related geotechnical services to assist the project team during design and construction of the project. GLA requires that it perform these services if it is to remain as the project Geotechnical Engineer-of-record.

During design, GLA can provide consultation and supplemental recommendations to assist the project team in design and value engineering, especially if the project design has been modified after completion of our report. It is impossible for us to anticipate every design scenario and use of construction materials during preparation of our report. Therefore, retaining GLA to provide post-report consultation will help address design changes, answer questions and evaluate alternatives proposed by the project designers and contractors.

Prior to issuing project plans and specifications for construction bidding purposes, GLA should review the grading, drainage and foundation plans and the project specifications to determine if the intent of our recommendations has been incorporated in these documents. We have found that such a review process will help reduce the likelihood of misinterpretation of our recommendations which may cause construction delay and additional cost.

Construction phase services can include, among other things, the observation and testing during site clearing, stripping, excavation, mass grading, subgrade preparation, fill placement and compaction, backfill compaction, foundation construction and pavement construction activities.

Geo-Logic Associates would be pleased to provide cost proposals for follow-up geotechnical services. Post-report geotechnical services may include additional field and laboratory services.

8 LIMITATIONS

In preparing the findings and professional opinions presented in this report, Geo-Logic Associates (GLA) has endeavored to follow generally accepted principles and practices of the engineering geologic and geotechnical engineering professions in the area and at the time our services were performed. No warranty, express or implied, is provided.

The conclusions and recommendations contained in this report are based, in part, on information that has been provided to us. In the event that the general development concept or general location and type of structures are modified, our conclusions and recommendations shall not be considered valid unless we are retained to review such changes and to make any necessary additions or changes to our recommendations. To remain as the project Geotechnical Engineer-of-record, GLA must be retained to provide geotechnical services as discussed under the Post-report Geotechnical Services section of this report.

Subsurface exploration is necessarily confined to selected locations and conditions may, and often do, vary between these locations. Should conditions different from those described in this report be encountered during project development, GLA should be consulted to review the conditions and determine whether our recommendations are still valid. Additional exploration, testing, and analysis may be required for such evaluation.

Should persons concerned with this project observe geotechnical features or conditions at the site or surrounding areas which are different from those described in this report, those observations should be reported immediately to GLA for evaluation.

It is important that the information in this report be made known to the design professionals involved with the project, that our recommendations be incorporated into project drawings and documents, and that the recommendations be carried out during construction by the contractor and subcontractors. It is not the responsibility of GLA to notify the design professionals and the project contractors and subcontractors.

The findings, conclusions, and recommendations in this report are applicable only to the specific project development on this specific site. These data should not be used for other projects, sites, or purposes unless they are reviewed by GLA or a qualified geotechnical professional.

Report prepared by,

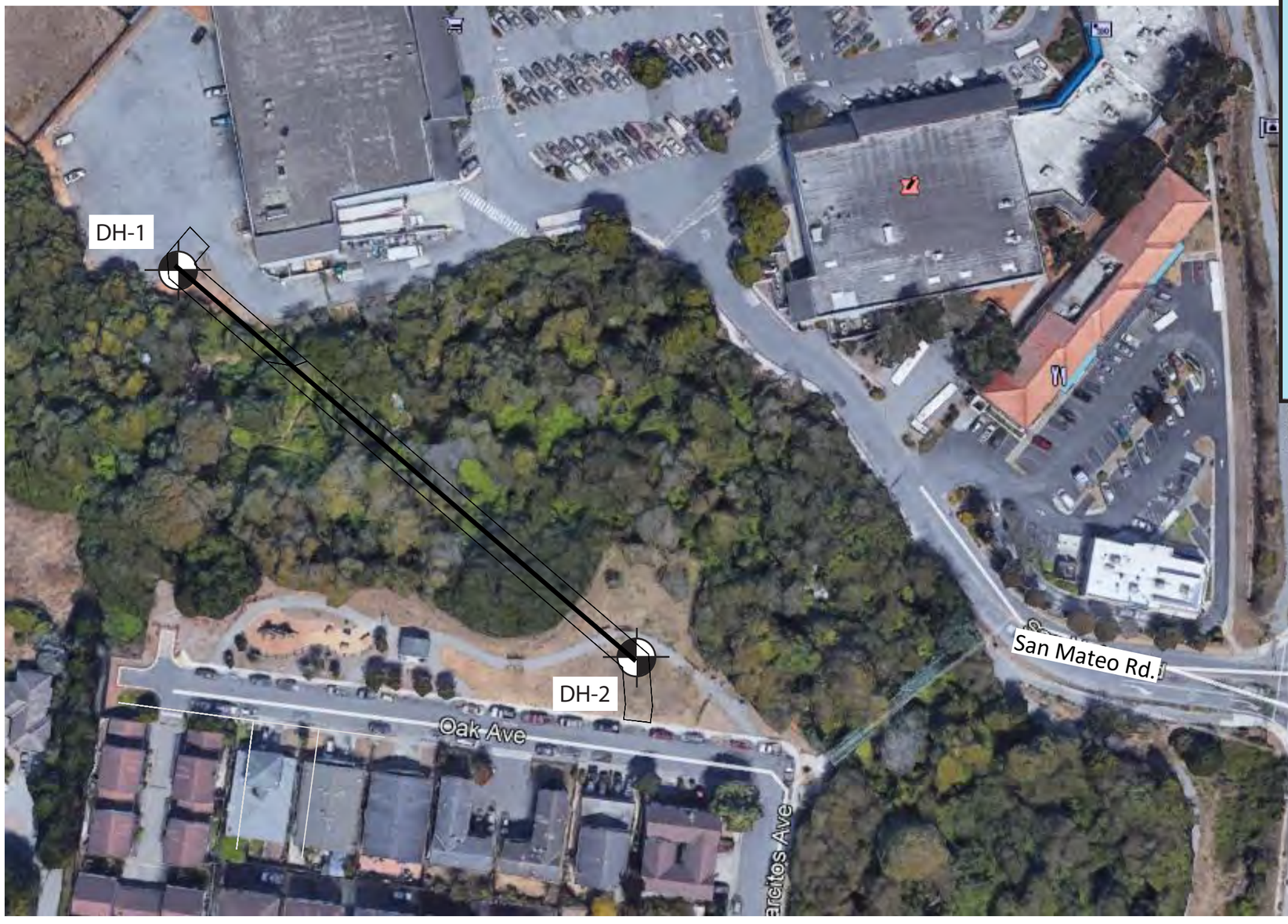
Geo-Logic Associates

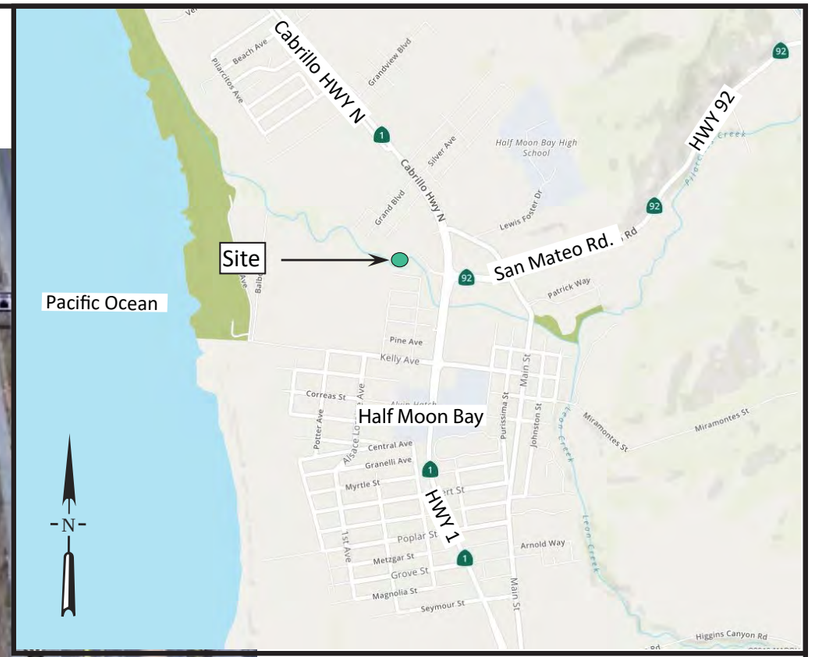
DRAFT FOR CLIENT REVIEW

Chalerm (Beeson) Liang
GE 2031

Fs/csl

Copies: Jonathan Sutter, EKI Environment and Water (3 hard copies & 1 electronic copy)





Vicinity Map (no scale)

EXPLANATION

DH-2 — Exploratory drill hole

Proposed HDD bore path

N

0 80 ft

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Date: September 2019
Checked By: Beeson Liang
Revision: September 2019

SITE PLAN (Proposed Development)
Pilarcitos Creek Crossing
San Mateo, California

FIGURE 1
PROJECT PA19.1032

APPENDIX A

KEYS TO SOIL CLASSIFICATION

and

DRILL HOLE LOGS

KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS

(50% OR MORE IS SMALLER THAN NO. 200 SIEVE SIZE)

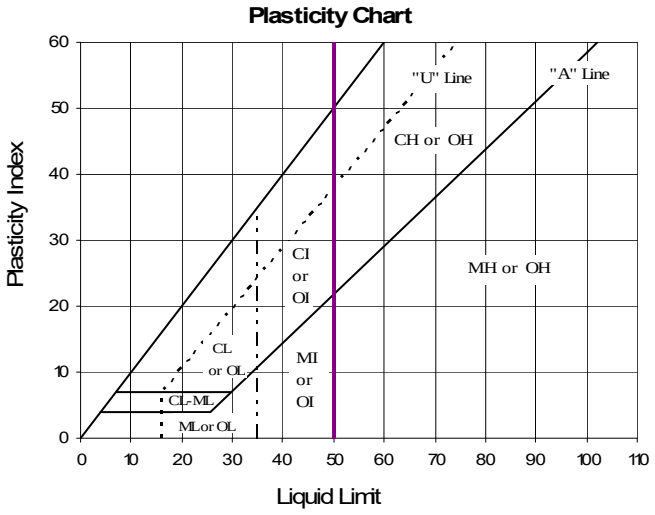
(modified from ASTM D2487 to include fine grained soils with intermediate plasticity)

MAJOR DIVISIONS			GROUP SYMBOLS	GROUP NAMES
SILTS AND CLAYS (Liquid Limit less than 35) Low Plasticity	Inorganic	PI < 4 or plots below "A" line	ML	Silt, Silt with Sand or Gravel, Sandy or Gravelly Silt, Sandy or Gravelly Silt with Sand or Gravel
	Inorganic	PI > 7 or plots on or above "A" line	CL	Lean Clay, Lean Clay with Sand or Gravel, Sandy or Gravelly Lean Clay, Sandy or Gravelly Lean Clay with Sand or Gravel
	Inorganic	PI between 4 and 7	CL-ML	Silty Clay, Silty Clay with Sand or Gravel, Sandy or Gravelly Silty Clay, Sandy or Gravelly Silty Clay with Sand or Gravel
	Organic	See footnote 3	OL	Organic Silt (below "A" Line) or Organic Clay (on or above "A" Line) (1,2)
SILTS AND CLAYS (35 ≤ Liquid Limit < 50) Intermediate Plasticity	Inorganic	PI < 4 or plots below "A" line	MI	Silt, Silt with Sand or Gravel, Sandy or Gravelly Silt, Sandy or Gravelly Silt with Sand or Gravel
	Inorganic	PI > 7 or plots on or above "A" line	CI	Clay, Clay with Sand or Gravel, Sandy or Gravelly Clay, Sandy or Gravelly Clay with Sand or Gravel
	Organic	See footnote 3	OI	Organic Silt (below "A" Line) or Organic Clay (on or above "A" Line) (1,2)
SILTS AND CLAYS (Liquid Limit 50 or greater) High Plasticity	Inorganic	PI plots below "A" line	MH	Elastic Silt, Elastic Silt with Sand or Gravel, Sandy or Gravelly Elastic Silt, Sandy or Gravelly Elastic Silt with Sand or Gravel
	Inorganic	PI plots on or above "A" line	CH	Fat Clay, Fat Clay with Sand or Gravel, Sandy or Gravelly Fat Clay, Sandy or Gravelly Fat Clay with Sand or Gravel
	Organic	See note 3 below	OH	Organic Silt (below "A" Line) or Organic Clay (on or above "A" Line) (1,2)

1. If soil contains 15% to 29% plus No. 200 material, include "with sand" or "with gravel" to group name, whichever is predominant.
2. If soil contains ≥30% plus No. 200 material, include "sandy" or "gravelly" to group name, whichever is predominant. If soil contains ≥15% of sand or gravel sized material, add "with sand" or "with gravel" to group name.
3. Ratio of liquid limit of oven dried sample to liquid limit of not dried sample is less than 0.75.

CONSISTENCY	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 – 0.5	2 – 4
FIRM	0.5 – 1.0	5 – 8
STIFF	1.0 – 2.0	9 – 15
VERY STIFF	2.0 – 4.0	16 – 30
HARD	> 4.0	> 30

MOISTURE	CRITERIA
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp, but no visible water
Wet	Visible free water, usually soil is below the water table



GEO-LOGIC ASSOCIATES

KEY TO SOIL CLASSIFICATION – COARSE GRAINED SOILS

(MORE THAN 50% IS LARGER THAN NO. 200 SIEVE SIZE)

(modified from ASTM D2487 to include fines with intermediate plasticity)

MAJOR DIVISIONS			GROUP SYMBOLS	GROUP NAMES[1]
GRAVELS (more than 50% of coarse fraction is larger than No. 4 sieve size)	Gravels with less than 5% fines	Cu ≥ 4 and 1 ≤ Cc ≤ 3	GW	Well Graded Gravel, Well Graded Gravel with Sand
		Cu < 4 and/or 1 > Cc > 3	GP	Poorly Graded Gravel, Poorly Graded Gravel with Sand
	Gravels with 5% to 12% fines	ML, MI or MH fines	GW-GM	Well Graded Gravel with Silt, Well Graded Gravel with Silt and Sand
			GP-GM	Poorly Graded Gravel with Silt, Poorly Graded Gravel with Silt and Sand
		CL, CI or CH fines	GW-GC	Well Graded Gravel with Clay, Well Graded Gravel with Clay and Sand
			GP-GC	Poorly Graded Gravel with Clay, Poorly Graded Gravel with Clay and Sand
	Gravels with more than 12% fines	ML, MI or MH fines	GM	Silty Gravel, Silty Gravel with Sand
		CL, CI or CH fines	GC	Clayey Gravel, Clayey Gravel with Sand
		CL-ML fines	GC-GM	Silty Clayey Gravel; Silty, Clayey Gravel with Sand
SANDS (50% or more of coarse fraction is smaller than No. 4 sieve size)	Sands with less than 5% fines	Cu ≥ 6 and 1 ≤ Cc ≤ 3	SW	Well Graded Sand, Well Graded Sand with Gravel
		Cu < 6 and/or 1 > Cc > 3	SP	Poorly Graded Sand, Poorly Graded Sand with Gravel
	Sands with 5% to 12% fines	ML, MI or MH fines	SW-SM	Well Graded Sand with Silt, Well Graded Sand with Silt and Gravel
			SP-SM	Poorly Graded Sand with Silt, Poorly Graded Sand with Silt and Gravel
		CL, CI or CH fines	SW-SC	Well Graded Sand with Clay, Well Graded Sand with Clay and Gravel
			SP-SC	Poorly Graded Sand with Clay, Poorly Graded Sand with Clay and Gravel
	Sands with more than 12% fines	ML, MI or MH fines	SM	Silty Sand, Silty Sand with Gravel
		CL, CI or CH fines	SC	Clayey Sand, Clayey Sand with Gravel
		CL-ML fines	SC-SM	Silty, Clayey Sand; Silty, Clayey Sand with Gravel

US STANDARD SIEVES	3 Inch	¾ Inch	No. 4	No. 10	No. 40	No. 200	
	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES & BOULDERS	GRAVELS		SANDS				SILTS AND CLAYS

RELATIVE DENSITY (SANDS AND GRAVELS)	STANDARD PENETRATION (BLOWS/FOOT)
Very Loose	0 - 4
Loose	5 – 10
Medium Dense	11 – 30
Dense	31 - 50
Very Dense	50+

1. Add “with sand” to group name if material contains 15% or greater of sand-sized particle. Add “with gravel” to group name if material contains 15% or greater of gravel-sized particle.

MOISTURE	CRITERIA
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp, but no visible water
Wet	Visible free water, usually soi is below the water table

GEO-LOGIC ASSOCIATES

DATE: 9/27/2019	LOG OF EXPLORATORY DRILL HOLE	DH- 1
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±42½ ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18.5 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
PAVEMENT (±2.5" AC over ±5" baserock)												
CLAY with SAND: Brown, moist, very stiff to hard; with mostly fine sand	Cl	1	S									
		2	D	33	4.5+			18		110		
black below approximately 2¼ feet		3	D									
		4	S									
Sandy Clay, dark brown, mostly fine sand		5	D D	41	2 1.5			18				
		6										
		7										
		8										
Clay with Sand, brown, with trace organics		9	S									
		10	D D	21	1.5 2.5			22		101		
		11										
		12										
CLAYEY SAND: Grey brown, moist, medium dense; mostly fine sand	SC	13										
		14	S									
		15	D D	22		23		25		123		
		16										
		17										
		18										
light brown, dense, mostly fine to medium sand, some coarse sand, trace fine gravel		19	S									
		20	I I	51								

DATE: 12/13/2018	LOG OF EXPLORATORY DRILL HOLE	DH- 1
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±42½ ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18.5 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
LEAN CLAY to CLAYEY SILT: Grey, moist, stiff	CL/ML	21										
		22										
		23										
		24	S									
		25	I	33		49		27				
CLAYEY SAND to SANDY LEAN CLAY: Grey, moist to wet, medium dense to dense sand/very stiff clay; mostly fine sand	SC/CL	26										
		27										
CLAY: Grey, moist, stiff	CI	28										
		29	S									
		30	D	43	2.5			26		101		
		31	D		1.25							
CLAYEY SAND: Grey, moist to wet, dense; mostly fine to medium sand	SC	32										
		33										
		34	S									
		35	D	41	1.5			31		93		
CLAY: Grey, moist, stiff	CI	36	D									
		37										
		38										
		39	S									
		40	D	34	2			30		94		
			D		1.75							

DATE: 12/13/2018	LOG OF EXPLORATORY DRILL HOLE	DH- 1
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±42½ ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18.5 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
CLAY (continued)	CL	41										
		42										
CLAYEY SAND: Grey, moist, very dense; mostly fine sand	SC	43										
		44	S I I	38 50/5"								
mostly fine to medium sand		45										
		46										
CLAYEY SAND with GRAVEL: Grey, moist, very dense, fine to coarse sand; wih fine gravel	SC	47										
		48										
		49	S I I	40 50/5"		15		12				
BOTTOM OF HOLE = 50 FEET		50										
		51										
		52										
		53										
		54										
		55										
		56										
		57										
		58										
		59										
		60										

DATE: 9/27/2019	LOG OF EXPLORATORY DRILL HOLE	DH- 2
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±40 ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
CLAY: Brown, moist, very stiff to hard	CL	1										
		2	S									
		3	D	30	4.5+			15		90		
		4	S									
dark brown		5	D	23	3.8			22		87		
		6	D		3							
		7										
		8										
		9	S									
sandy clay, brown, stiff to very stiff		10	D	21		46		19		120		
CLAYEY SAND: Brown, moist, medium dense; mostly fine to medium sand	SC	11	D									
		12										
SANDY CLAY: Brown, moist, very stiff, with mostly fine sand	CL	13										
		14	S									
		15	D	45	2.7	23		26 19		101 116		
CLAYEY SAND: Grey, moist, medium dense; fine to coarse sand	SC	16	D									
		17										
CLAY: Brown, moist, stiff	CL	18										
		19	S									
		20	I	26								
CLAY: Grey, moist, stiff; with thin sand lenses	CL		I									

DATE: 9/27/2019	LOG OF EXPLORATORY DRILL HOLE	DH- 2
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±40 ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
CLAY (continued)	CI	21										
		22										
CLAYEY SAND: Grey, moist to wet, medium dense; mostly fine sand	SC	22										
		23										
		24	S D	23		43		25				
	SC/ CL	25										
		26										
		27										
		28										
very dense		29	S I	70								
		30										
		31										
		32										
		33										
dense, fine to coarse sand, fine gravel		34	S I	40		17		17				
		35										
		36										
		37										
		38										
very dense		39	S I	15 50/6"								
		40										

DATE: 9/27/2019	LOG OF EXPLORATORY DRILL HOLE	DH- 2
PROJECT NAME: Pilarcitos Creek Crossing	PROJECT NUMBER:	PA19.1051
DRILL RIG: Mobile B-53R	LOGGED BY:	BL
HOLE DIAMETER: 8-inch hollow stem auger	HOLE ELEVATION:	±40 ft

SAMPLER: D = 3" OD, 2½" ID Split-spoon; X = 2½" OD, 2" ID Split-spoon; I = Standard Penetrometer (2" OD SPT); S = Slough in sample

GROUND WATER DEPTH: Initial: ±18 ft; Final: ---

DESCRIPTION OF EARTH MATERIALS	SOIL TYPE	DEPTH (ft)	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	% PASSING #200 SIEVE	LIQUID LIMIT	WATER CONTENT	PLASTICITY INDEX	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED COMPRESSIVE STRENGTH (psf)
CLAYEY SAND with GRAVEL: Grey, moist to wet, dense to very dense; fine to coarse sand, with fine gravel	SC	41										
		42										
		43										
		44	S	53		18		14				
		45	I									
		46										
		47										
		48										
		49	S	43		15						
		50	I									
BOTTOM OF HOLE = 50 FEET		51										
		52										
		53										
		54										
		55										
		56										
		57										
		58										
		59										
		60										

APPENDIX B

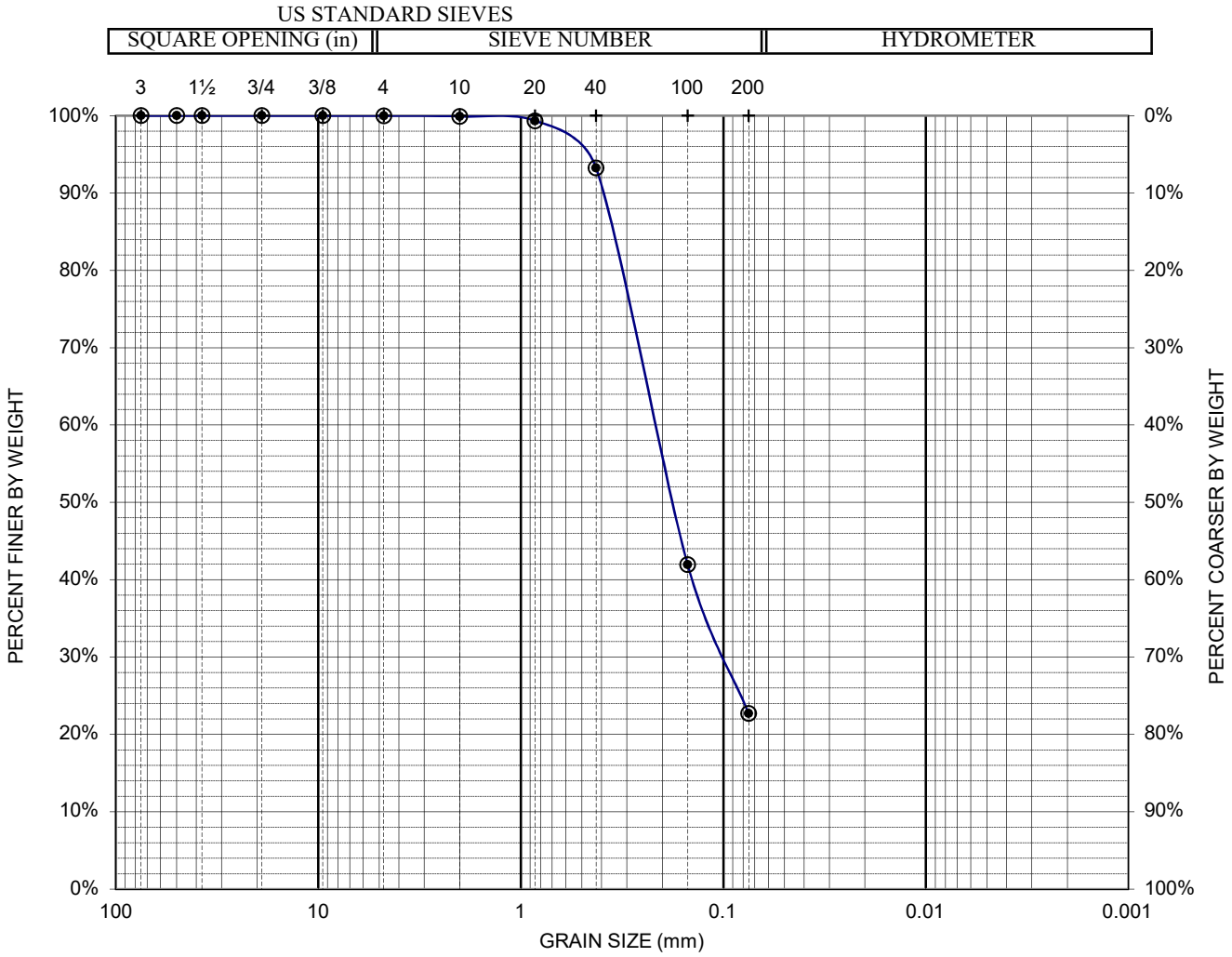
LABORATORY TEST RESULTS

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	1	**DEPTH (ft)** 14.5-15	**SAMPLE** 0	**DATE OF TEST**	11/13/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey brown clayey sand, mostly fine sand



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	0.0%		77.3%			22.7%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-1

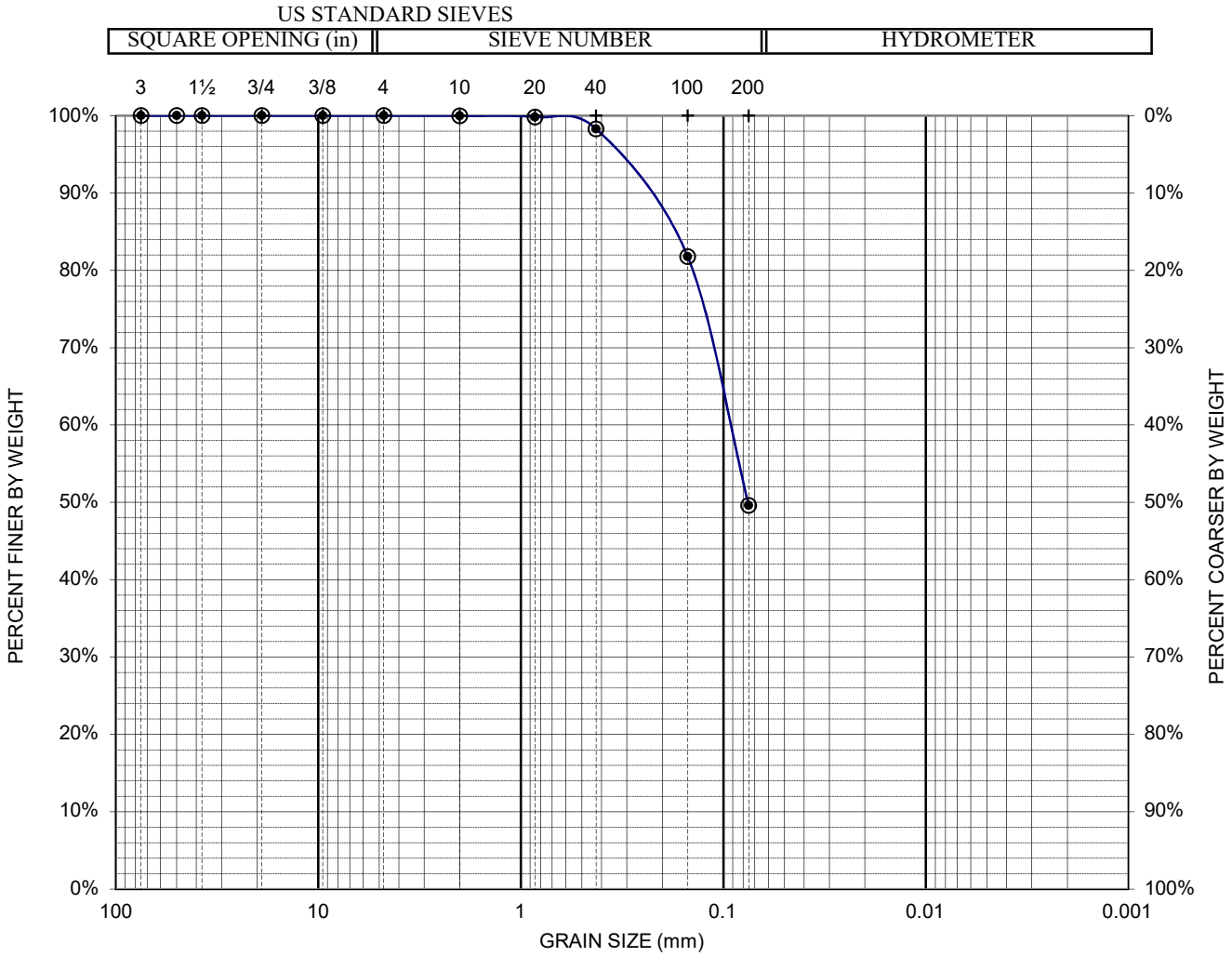
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	1	**DEPTH (ft)** 24.5-25	**SAMPLE** 0	**DATE OF TEST**	11/13/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand to sandy lean clay, fine sand



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	0.0%		50.4%			49.6%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-2

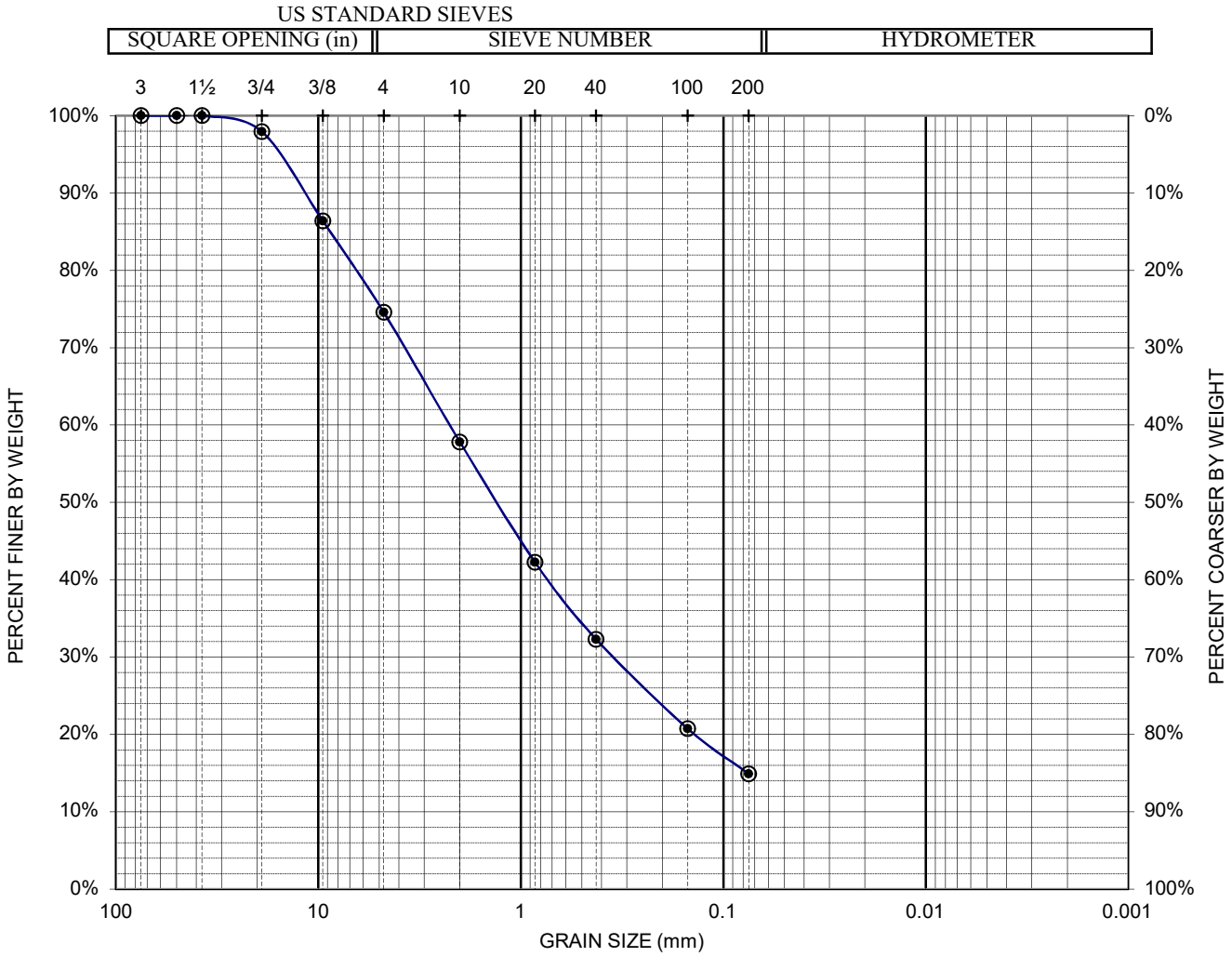
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	1	**DEPTH (ft)** 49-50	**SAMPLE** 0	**DATE OF TEST**	11/13/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand, fine to coarse sand, fine gravel



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	25.4%		59.6%			14.9%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-3

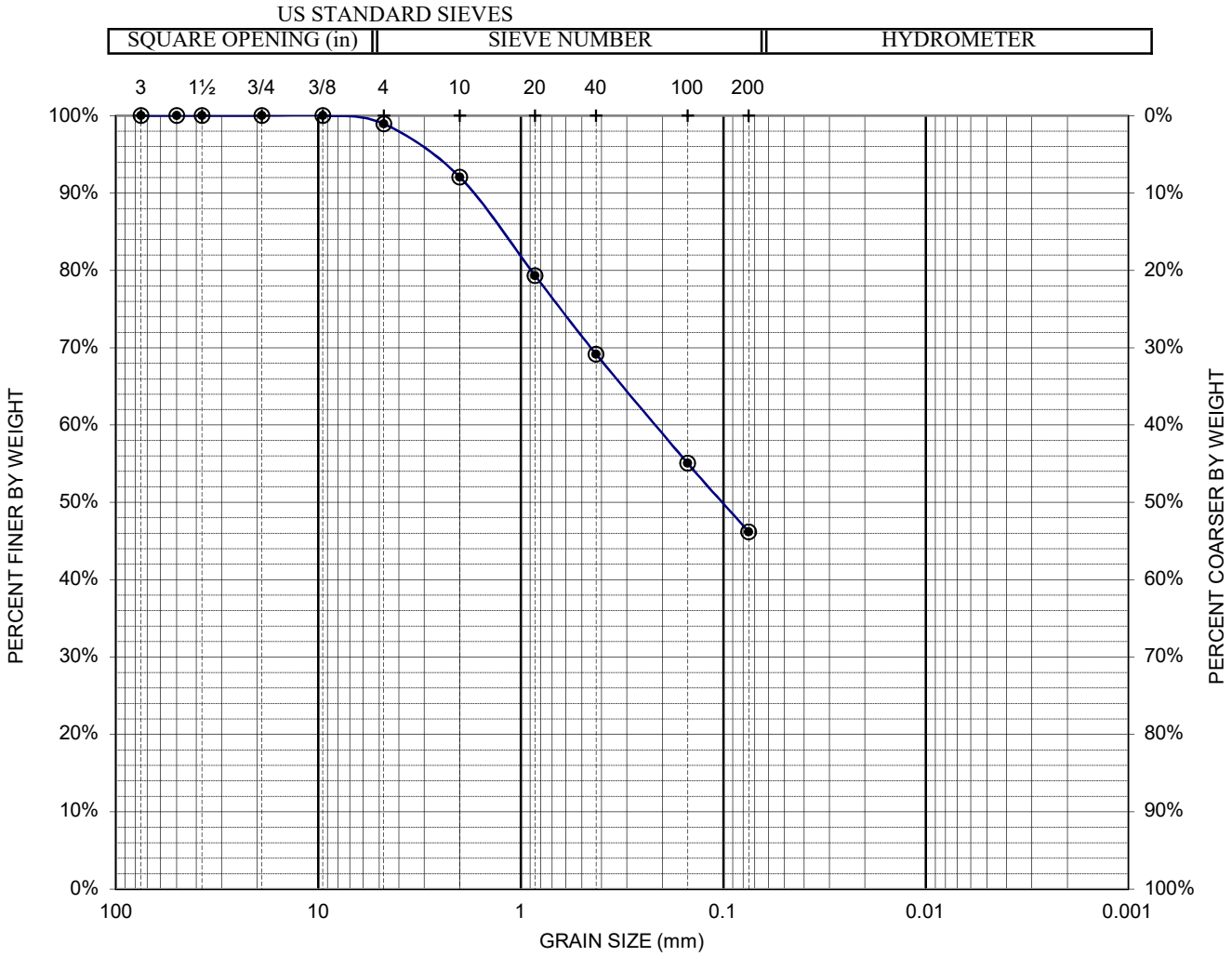
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	2	**DEPTH (ft)** 9.5-10	**SAMPLE** 0	**DATE OF TEST**	11/14/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Brown clayey sand, fine sand



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	1.1%		52.7%			46.2%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-4

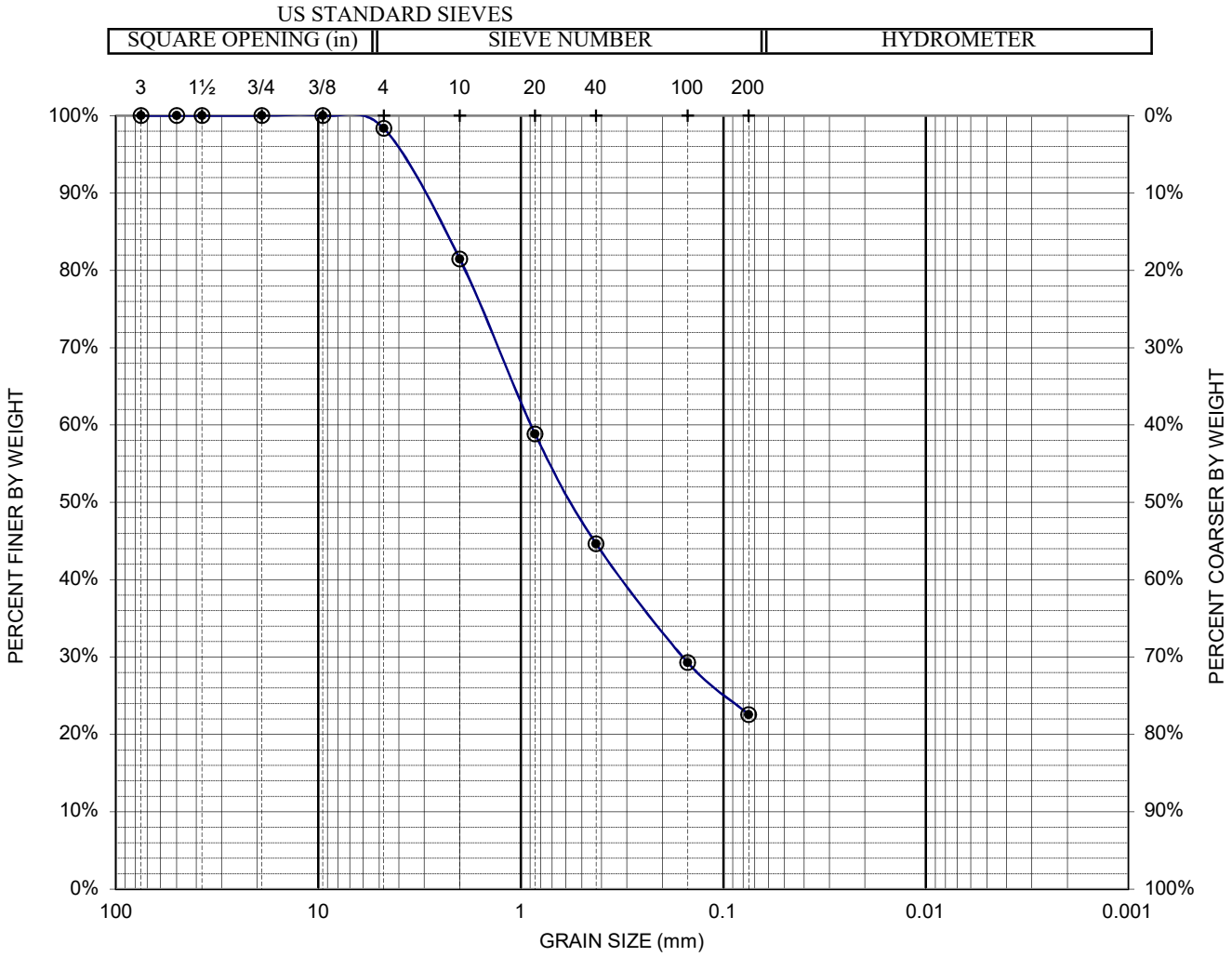
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	2	**DEPTH (ft)** 14.5-15	**SAMPLE** 0	**DATE OF TEST**	11/14/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand, fine to coarse sand



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	1.7%		75.8%			22.6%

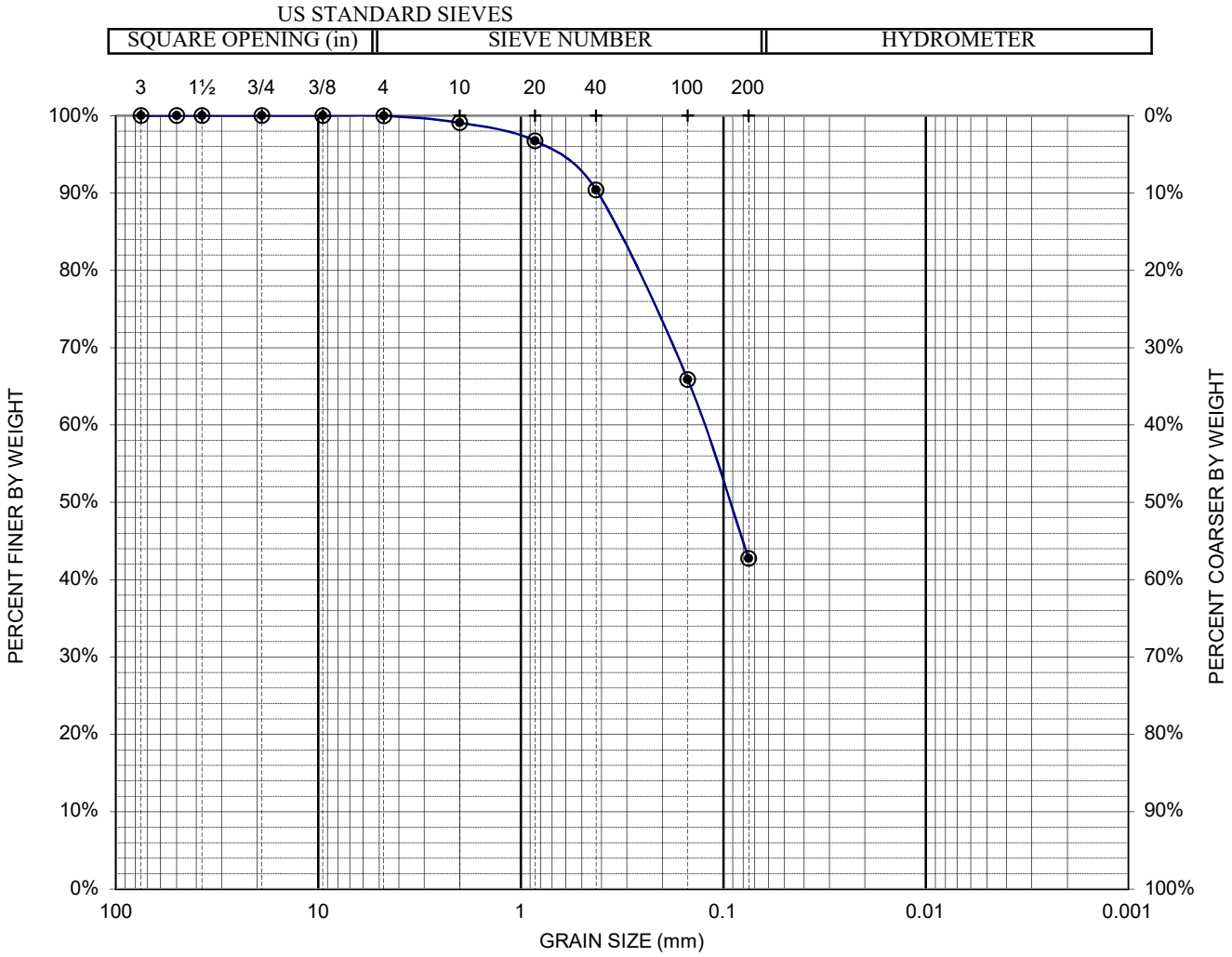
REMARKS:

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	2	**DEPTH (ft)** 24-25	**SAMPLE** 0	**DATE OF TEST**	11/14/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand, mostly fine sand



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	0.0%		57.2%			42.8%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-6

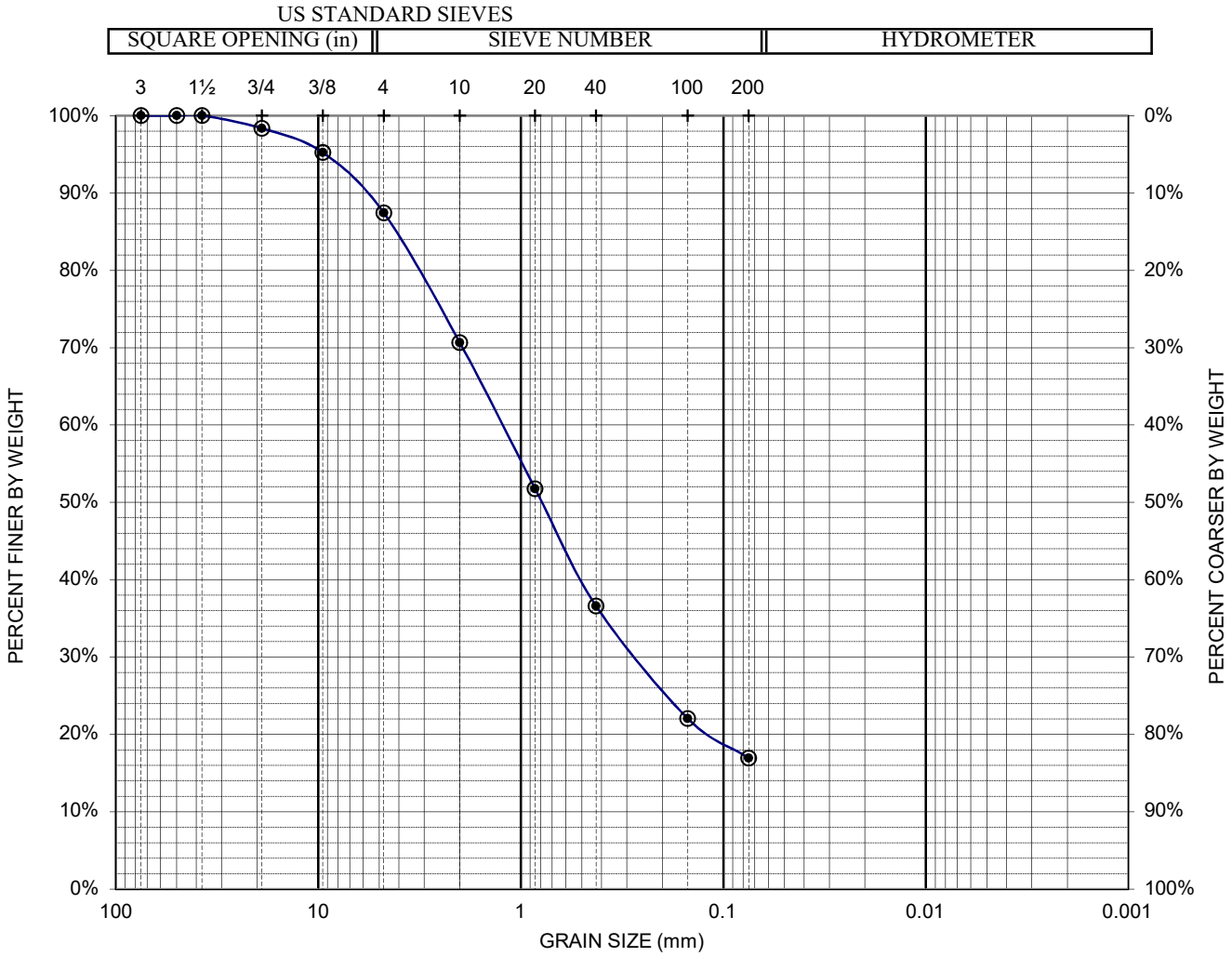
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	2	**DEPTH (ft)** 34-35	**SAMPLE** 0	**DATE OF TEST**	11/14/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand, fine to coarse sand, fine gravel



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	12.6%		70.5%			17.0%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-7

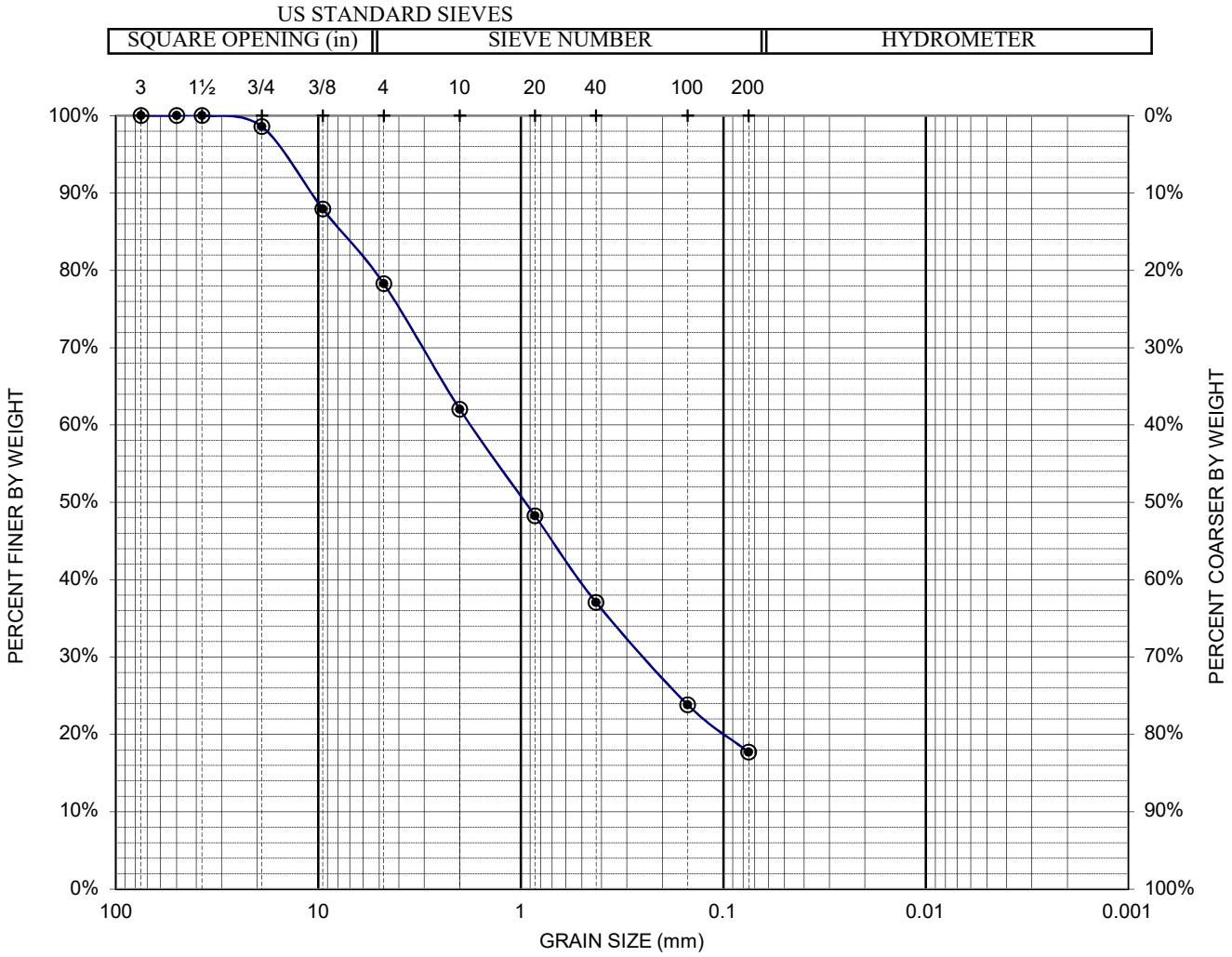
RevOct20070

GRAIN SIZE TEST RESULTS

PROJECT NAME	Pilarcitos Creek Crossing			**PROJECT No.**	PA19.1051.00
DRILL HOLE No.	2	**DEPTH (ft)** 44-45	**SAMPLE** 0	**DATE OF TEST**	11/14/2019

SOURCE/QUARRY: ---

DESCRIPTION OF SOIL: Grey clayey sand with gravel, fine to coarse sand, fine gravel



	COARSE	FINE	COARSE	MEDIUM	FINE	
COBBLES	GRAVEL		SAND			SILT & CLAY
	21.7%		60.5%			17.7%

REMARKS:

GEO-LOGIC ASSOCIATES

Figure B-8

RevOct20070

Appendix C

30% Design Drawings

(See Appendix E of the Biological Resources Evaluation for 100% Design Drawings)

Appendix D

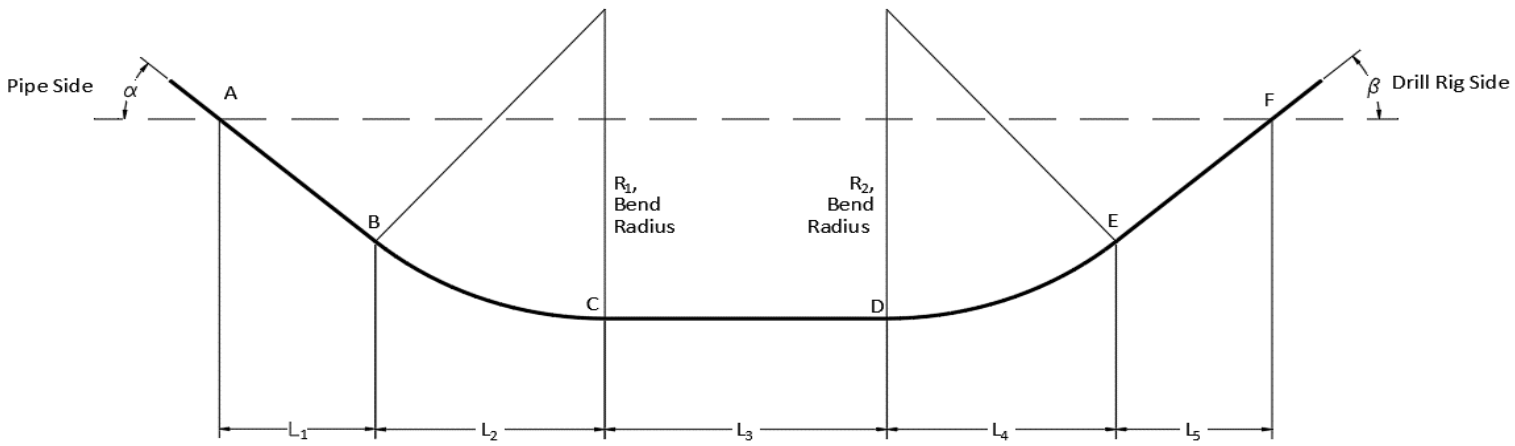
Calculations of Pullback Loads and Stresses

Table 1 - Assumed Parameters

Variable	Definition	Unit	Assumed Value
D_{pipe}	Outer diameter of the pipe	Inches (in)	10.75
DR	Pipe Dimiension Ratio	-	11
ρ_w	Unit weight of water	pounds per cubic feet (lb/ft^3)	62.4
Υ_p	Specific gravity of pipe material	-	0.96
w_p	Weight of the pipe on the ground surface	pounds per gallon (lbs/ft)	*
D_{bore}	bore diameter	Inches (in)	16.125
T_i	Tensile load in section	pounds (lbs)	*
T_{hki}	Tensile load due to hydrokinetic drag in each bore section	pounds (lbs)	*
μ_g	Coefficient of friction between the pipe and rollers/ground surface	-	0.15
μ_b	Coefficient of friction between the pipe and bore	-	0.3
α	Angle of descent (exit angle)	radians	0.262
β	Angle of ascent (entry angle)	radians	0.262
γ	Angle of flat central tangent section	radians	0.000
w_b	Bouyant weight of the pipe in the bore (negative = bouyant)	pounds per gallon (lbs/gal)	*
w_{df}	Weight of drilling fluid	pounds per gallon (lbs/gal)	11
L_1	Horizontal length of bore section 1 (straight tangent; A to B)	feet (ft)	65.27
L_2	Horizontal length of bore section 2 (vertical curve; B to C)	feet (ft)	129.43
L_3	Horizontal length of bore section 3 (straight section; C to D)	feet (ft)	85.88
L_4	Horizontal length of bore section 4 (vertical curve; D to E)	feet (ft)	129.43
L_5	Horizontal length of bore section 5 (straight tangent; E to F)	feet (ft)	59.14
R_1	Bend radius of a first vertical curve	feet (ft)	500.00
R_2	Bend radius of a second vertical curve	feet (ft)	500.00
H_B	Depth of borehole from ground surface (taken from entry)	feet (ft)	17.49
H_C	Depth of borehole from ground surface (taken from entry)	feet (ft)	34.53
H_D	Depth of borehole from ground surface (taken from entry)	feet (ft)	34.53
H_E	Depth of borehole from ground surface (taken from entry)	feet (ft)	17.49
PV	Plastic viscosity of the drilling fluid	Centipoise (cp)	60.00
YP	Yield point of the drilling fluid	pounds per 100 sqaure feet [$lb/(100ft^2)$]	25.00
V_a	Annular flow velocity in the bore	feet per second (ft/sec)	*
R_{df}	Drilling fluid pumping rate	gallons per minute (gal/min)	150
Δp_i	Pressure drop due to hydrokinetic drag	pounds per square inch (lb/in^2)	*
t	pipe wall thickness	Inches (in)	0.977
I	Moment of inertia ($t^3/12$)	in^4	0.078
E (Installation)	Time-dependent modulus of elasticity of pipe material (12 hour assumed from PE4710)	pounds per square inch (lb/in^2)	63,000
E (Operation)	Time-dependent modulus of elasticity of pipe material (1000 hour assumed from PE4710)	pounds per square inch (lb/in^2)	46,000
F_s	Maximum allowable pull load or safe pull force	pounds (lbs)	*
T_{allow}	Safe pull stress	pounds per square inch (lb/in^2)	1,150
γ_b	Specific gravity of drilling fluid	-	1.32
γ_c	Specific gravity of ballast water	-	1.00
P_{net}	Net external pressure on pipe during installation	pounds per square inch (lb/in^2)	*
P_{mud}	Hydrostatic head due to drilling fluid, pounds per square inch	pounds per square inch (lb/in^2)	*
$P_{hydrokinetic}$	Hydrostatic head due to hydrokinetic drag (recommended 10 psi)	pounds per square inch (lb/in^2)	10
$P_{internal}$ (Install.)	Pressure due to internal contents during installation	pounds per square inch (lb/in^2)	0
$P_{internal}$ (Oper.)	Pressure due to internal contents during operation with pipe drained	pounds per square inch (lb/in^2)	0
P_{UC}	Unconstrained bucking pressure	pounds per square inch (lb/in^2)	*
f_0	ovality compansation factor	-	*
F_R	Unconstrained bucking pressure reduction factor	-	*
F_{CR}	Critical buckling pressure	pounds per square inch (lb/in^2)	*
P_E	External earth pressure from deformed borehole with arching mobilized	pounds per square inch (lb/in^2)	*
k	Arching factor	-	*
g_{se}	Soil unit weight	pounds per cubic feet (lb/ft^3)	125
H_w	Depth to groundwater (taken from entry)	feet (ft)	18.50
B	Silo width (assumed to equal backreamed bore diameter)	feet (ft)	1.344
δ	Angle of wall friction (for HDD, equals soil friction angle)	degree	23.5
K	Rankine active earth pressure coefficient	-	0.430
P_{SUR}	Surcharge and live loads	pounds per square inch (lb/in^2)	0
v	Poisson's ratio HDPE	-	0.46
Ballasted	"Yes"/"No"	-	No

* Calculated Value

Figure 1 - Bore Geometry Schematic



(1) Estimate Pipe Weights

(1.1) Weight of empty pipe (lb/ft) [1]

$$w_p = \pi \left(D_{pipe} \frac{ft}{12\ in} \right)^2 \frac{DR - 1}{DR^2} \rho_w \gamma_p$$

w_p (lb/ft)	12.5

(1.2) Net Buoyant Force on Empty Pipe (lb/ft) (Buoyant = Negative) [1]

$$w_b = \pi \frac{\left(D_{pipe} \frac{ft}{12\ in} \right)^2}{4} \rho_w \gamma_b - w_p$$

w_b (lb/ft)	-39.4

(1.3) Net Buoyant Force on ballasted Pipe (lb/ft) (Buoyant = Negative) [1]

$$w_b = \pi \frac{\left(D_{pipe} \frac{ft}{12\ in} \right)^2}{4} \rho_w \left(\gamma_b - \gamma_c \left(1 - \frac{2}{DR} \right) \right)^2 - w_p$$

w_b (lb/ft)	2.6

(1.4) Ballasted? No

w_b (lb/ft)	-39.4

(2) Calculate Pipe Pull Forces Along HDD Profile

(2.1) Hydrokinetic drag [5]:

$$T_{hki} = \Delta p_i \frac{\pi\left(D_{bore}^2 - D_{pipe}^2\right)D_{pipe}}{4\left(D_{bore} - D_{pipe}\right)}$$

Where:

$$\Delta p_i = \left(\frac{PV \cdot V_a}{1000\left(D_{bore} - D_{pipe}\right)^2} + \frac{YP}{200\left(D_{bore} - D_{pipe}\right)}\right) L_i$$

And where:

$$V_a = \frac{0.408 \cdot R_{df}}{\left(D_{bore}^2 - D_{pipe}^2\right)}$$

V_a (ft/s)	0.42

	1	**2**	**3**	**4**	**5**
Δp_i (lb/in^2)	1.58	3.12	2.07	3.12	1.43
T_{hki} (lb)	357	709	470	709	324

(2.2) Tensile load at points A, B, C, D, E, and F [4]:

$$T_A = e^{\mu_g \alpha}\left(\mu_a w_p (L_1 + L_2 + L_3 + L_4)\right)$$

$$T_B = T_A + T_{hk1} + \mu_b |w_b| L_1 \cos\alpha - w_b L_1 \sin\alpha - e^{\mu_g \alpha}\left(\mu_g w_p L_1\right)$$

$$T_C = e^{\mu_b(\alpha-\gamma)}\left(T_B + T_{hk2} + \mu_b |w_b| L_2 - w_b L_2 \sin\frac{\alpha}{2} - e^{\mu_g \alpha}\left(\mu_g w_p L_2\right)\right)$$

$$T_D = T_C + T_{hk3} + \mu_b |w_b| L_3 \cos\gamma - w_b L_3 \sin\gamma - e^{\mu_b(\alpha-\gamma)}\left(e^{\mu_g \alpha}\left(\mu_g w_p L_3\right)\right)$$

$$T_E = e^{\mu_b(\beta+\gamma)}\left(T_D + T_{hk4} + \mu_b |w_b| L_4 - w_b L_4 \sin\frac{\beta}{2} - e^{\mu_b(\alpha-\gamma)}\left(e^{\mu_g \alpha}\left(\mu_g w_p L_4\right)\right)\right)$$

$$T_F = T_E + T_{hk5} + \mu_b |w_b| L_5 \cos\beta - w_b L_5 \sin\beta - e^{\mu_b(\beta+\gamma)}\left(e^{\mu_b(\alpha-\gamma)}\left(e^{\mu_g \alpha}\left(\mu_g w_p L_5\right)\right)\right)$$

Where Maximum allowable pull load of safe pull force (ASTM F1962):

$$F_s = (T_{allow})\pi D_{pipe}^2\left(\frac{1}{DR} - \frac{1}{DR^2}\right)$$

F_s (lb)	34,505

Location	**Calculated Loads, T_i (lb)**	**Startup Loads, T_i* (lb)**	**Factor of Safety (F_s/T_i)**
Entry point (A)	914	1,370	25.2
End of straight tangent/beginning of vertical curve (B)	2,554	3,831	9.0
End of vertical curve/beginning of straight section (C)	5,630	8,446	4.1
End of straight section/beginning of vertical curve (D)	6,934	10,402	3.3
End of vertical curve/beginning of straight tangent (D)	10,346	15,520	2.2
Exit point (F)	11,813	17,720	1.9

*Startup loads estimated at 1.5x steady state loads

(3) Combined pipe stress at points A, B, C, D, E, and F [4]:

$$s_{ti} = \frac{T_i}{\pi t\left(D_{pipe} - t\right)} + \frac{E_T D_{pipe}}{2R_i}$$

Location	Combined Stress, s_{ti}* (lb/in^2)	Combined Stress Ratio (s_{ti}/T_{allow}) (Must be ≤1)	
Entry point (A)	46	0.04	Good
End of straight tangent/beginning of vertical curve (B)	184	0.16	Good
End of vertical curve/beginning of straight section (C)	338	0.29	Good
End of straight section/beginning of vertical curve (D)	403	0.35	Good
End of vertical curve/beginning of straight tangent (D)	574	0.50	Good
Exit point (F)	591	0.51	Good

*Startup loads estimated at 1.5x steady state loads

(4) Pipe Collapse During Installation:

(4.1) Net external pressure on the pipe during installation [4]:

$$P_{net} = P_{mud} + P_{hydrokinetic} - P_{internal}$$

where:

$$P_{mud} = \frac{7.48}{144} w_{df} H_i$$

Location	Net external pressure, P_{net} (lb/in^2)
Entry point (A)	--
End of straight tangent/beginning of vertical curve (B)	20
End of vertical curve/beginning of straight section (C)	30
End of straight section/beginning of vertical curve (D)	30
End of vertical curve/beginning of straight tangent (D)	20
Exit point (F)	--

(4.2) Pipe Vertical Ring Deflection During Installation (Buoyant Deflection) [1]:

$$\%Deflection = \frac{0.1169 * \left(\frac{7.48}{1728} w_{df}\right)\left(\frac{D_{pipe}}{2}\right)}{EI} \times 100$$

1728

%Deflection	0.09

(4.3) Critical buckling pressure:

From reference [2], Figure 3:

f_0	1

$$P_{UC} = \left(\frac{2E}{1-v^2}\right)\left(\frac{1}{DR-1}\right)^3 f_0$$

P_{UC} (lb/in^2)	159.8

$$F_R = \sqrt{5.57 - \left(\frac{S_{ti}}{2T_{allow}} - 1.09\right)^2} - 1.09$$

$$F_{CR} = P_{UC} F_R$$

Location	Reduction Factor, F_R	Critical Buckling Pressure, F_{CR} (lb/in^2)	Installation Buckling Stress Ratio (FCR/Pnet) (must be ≥2)	
Entry point (A)	--	--	--	
End of straight tangent/beginning of vertical curve (B)	1.04	167	8.3	Good
End of vertical curve/beginning of straight section (C)	1.07	172	5.8	Good
End of straight section/beginning of vertical curve (D)	1.09	174	5.8	Good
End of vertical curve/beginning of straight tangent (D)	1.12	178	8.9	Good
Exit point (F)	--	--	--	

(5) Pipe Collapse During Operations:

(5.1) Earth pressure for deformed borehole with arching mobilized (i.e., not collapsed borehole)

$$P_E = \frac{k g_{se} H_C}{144}$$

where:

$$k = \frac{1 - e^{-2\frac{KH_C}{B}\tan\left(\frac{\delta}{2}\right)}}{2\frac{KH_C}{B}\tan\left(\frac{\delta}{2}\right)}$$

k	0.22
P_E (lb/in^2)	6.5

(5.2) Groundwater Pressure

$$P_{GW} = \frac{\rho_w(H_C - H_W)}{144}$$

P_{GW} (lb/in^2)	6.9

(5.3) Net external pressure on the pipe during operation (drained):

Max of:

$$P_{net} = P_E + P_{GW} + P_{SUR} - P_{internal}$$

or:

$$P_{net} = P_{MUD} - P_{internal}$$

P_{net} (lb/in^2)	19.7

(5.4) Pipe Vertical Ring Deflection During Operation:

(5.4.1) Ring Deflection from earth pressure:

$$\%deflection = \frac{0.0125P_E}{\left(\frac{E}{12(DR-1)^3}\right)} \times 100$$

%Deflection	2.11

(5.4.2) Buoyant Deflection:

$$\%Deflection = \frac{0.1169 * \left(\frac{7.48}{1728} w_{df}\right)\left(\frac{D_{pipe}}{2}\right)}{EI} \times 100$$

%Deflection	0.13

(5.4.2) Reissner Effect:

$$\%Deflection = \left(\frac{2}{3}\right)Z + \left(\frac{71}{135}\right)Z^2$$

$$Z = \frac{\frac{3}{2}(1-v^2)\left(D_{pipe}-t\right)^4}{16t^2(12 \times R_1)^4}$$

Z	5.4505E-13
%Deflection	3.6337E-11

(5.4.2) Total Deflection:

%Deflection	2.24

(5.4.3) Allowable Deflection:

%Deflection	5.00	Check > Total Deflection

(5.5) Critical buckling pressure during operation:

$$F_{CR} = P_{UC}$$

$$P_{UC} = \left(\frac{2E}{1-v^2}\right)\left(\frac{1}{DR-1}\right)^3 f_0$$

f_0	0.82
F_{CR} (lb/in^2)	95.7
Installation Buckling Stress Ratio (FCR/Pnet) (must be ≥2)	4.8

Good

REFERENCES

[1] ASTM-F1962 (2005), "Standard guide for use of maxi-horizontal directional drilling for placement of polyethylene pipe or condituit under obstacles, including river crossings", ASTM International.

[2] Handbook of PE Pipe, Second Edition, "Chapter 3 - Material Properties, Appendix B". Irving Tx: The Plastic Pipe Institute, 2008.

[3] Handbook of PE Pipe, Second Edition, "Chapter 12 - Horizontal Directional Drilling". Irving Tx: The Plastic Pipe Institute, 2008.

[4] Horizontal Directional Drilling (HDD) Good Practices Guidelines, Fourth Edition. North American Society for Trenchless Technology,

[5] Duyvestyn, Glenn (2009), "Comparison of Predicted and Observed HDD Installation Loads for Various Calculation Methods", Proceedings, NO-DIG 2009 International Conference, Toronto, On, paper B-1-01.

TABLE B.1.1
Apparent Elastic Modulus for 73°F (23°C)

Duration of Sustained Loading	Design Values For 73°F (23°C) [1,2,3]					
	PE 2XXX		PE3XXX		PE4XXX	
	psi	MPa	psi	MPa	psi	MPa
0.5hr	62,000	428	78,000	538	82,000	565
1hr	59,000	407	74,000	510	78,000	538
2hr	57,000	393	71,000	490	74,000	510
10hr	50,000	345	62,000	428	65,000	448
12hr	48,000	331	60,000	414	63,000	434
24hr	46,000	317	57,000	393	60,000	414
100hr	42,000	290	52,000	359	55,000	379
1,000hr	35,000	241	44,000	303	46,000	317
1 year	30,000	207	38,000	262	40,000	276
10 years	26,000	179	32,000	221	34,000	234
50 years	22,000	152	28,000	193	29,000	200
100 years	21,000	145	27,000	186	28,000	193

From Reference [2]

TABLE 2
Design Deflection Limits of Buried Polyehtylene Pipe, Long Term, %*

DR or SDR	21	17	15.5	13.5	11	9	7.3
Deflection Limit (% Δy/D) Non-Pressure Applications	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Deflection Limit (%Δy/D) Pressure Applications	7.5	6.0	6.0	6.0	5.0	4.0	3.0

* Design deflection limits per ASTM F1962, Guide for Use of Maxi-Horizontal Directional Drilling for Placement of PE Pipe or Conduit Under Obstacles, Including River Crossings.

From Reference [3]

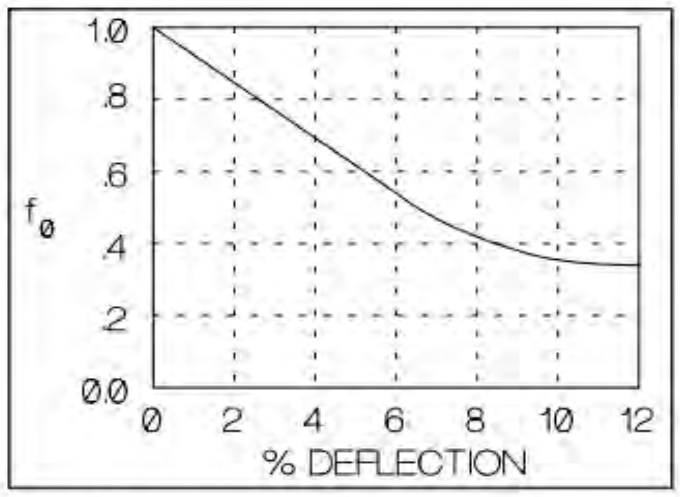


Figure 3 Ovality Compensation Factor f_O

From Reference [3]

Appendix E

Calculations of Hydrofracture Risk

(1) Summary of Input Values

(1.1) Summary of Input Values

Table 1 - Geotechnical Model

Soil Group No.	Soil Type	Elevation of Strata Top	Elevation of Stata Bottom	Unit Weight	Max Thickness (ft)	Friction Angle,	Shear Modulus, G (psf)	Cohesion Coeff., c (psf)
1	Clay to Clay with Sand	42	30.5	110	11	0	30000	1350
2	Clayey Sand	32.5	22.5	125	8	31	550000	0
3	Clay to Clayey Silt	24.5	18	125	4.5	0	7000	1000
4	Clayey Sand to Clay	20	0.5	110	17.5	30	450000	0
5	Clayey Sand with Gravel	4	-7.5	125	12	36	990000	0

(1.2) Groundwater Parameters

El_w (ft)	23.5	groundwater elevation taken from entry

(1.3) Assumed Drilling Fluid Properties

γ_{mud} (lb/gal)	11	unit weight of drilling fluid	
μ_p (cp)	60	viscosity of the drilling fluid	
Q (gal/min)	150	flow rate at the drill bit	
τ_y (lb/100 $ft^{2)}$	25	yield point of drilling fluid	might be a little high - more like 15 in real world
v (ft/sec)	1.18	velocity of the drilling fluid = Q/A, i.e., flow rate/area of bore annulus	

(1.3) Assumed Bore Dimensions

d_{bore} (in)	8.00	Min. diameter of bore hole to avoid hydrofracture below creek
R_0 (ft)	0.33	Bore hole radius d/2
d_{pipe} (in)	3.500	diameter of drill pipe
A (ft^2)	0.28	area of bore annulus
R_{pmax} (ft)	50% x h_{tot}	Radius of plastic zone

(2) Maximum Allowable Pressure (P_{max}) Calculation

$$P_{max} = u + [\sigma'_0 \cdot (1 + \sin\varphi) + c \cdot \cos\varphi + c \cdot \cot\varphi]\left(\left(\frac{R_0}{R_{pmax}}\right)^2 + \frac{\sigma'_0 . \sin\varphi + c \cdot \cos\varphi}{G}\right)^{\frac{-\sin\varphi}{1+\sin\varphi}} - c \cdot \cot\varphi$$

Where:

P_{max} = Maximum allowable pressure that a given soil at a given depth can withstand without hydrofracturing, lb/ft^3

φ = Friction angle of soil

R_0 = Bore radius, ft

G = Shear modulus, lb/ft^3

c = Cohesion coefficient, lb/ft^2

u = Initial groundwater pressure, defined as γwater * hw, lb/FT2

R_{pmax} = Radius of the plastic zone (ft). (May include safety factor to prevent the plastic zone from reaching the ground surface).

σ_0' = Effective stress as defined as γ * (h_{tot} - h_w) + γ' * h_w, where

γ = Total unit weight of soil above groundwater, lb/FT3

γ' = Effective unit weight of soil below groundwater, equal to γ - γ_{water}, lb/ft^3

γ_{water} = 62.4 lb/ft^3 for fresh water and 64.08 lb/ft^3 for salt water

h_{tot} = Depth of the bore below ground surface, ft

h_w = Depth of the bore below groundwater elevation, ft

(3) Minimum Required Downhole Pressure (Pmin) Calculation

$$P_{min} = \frac{7.48 \cdot \gamma_{mud} . h_{bore}}{144} + L_{bore} . \left[\left(\frac{\mu_p \cdot v}{1000 \cdot (d_{bore} - d_{pipe})^2}\right) + \left(\frac{\tau_y}{200 \cdot (d_{bore} - d_{pipe})}\right)\right]$$

Where:

γ_{mud} = unit weight of drilling fluid, lb/gal

h_{bore} = Height of mud column or the difference in depth from a specific location in the bore to the surface of the entry pit, ft

L_{bore} = Horizontal distance from a specific location in the bore to entry pit, ft

μ_p = Viscosity of drilling fluid, cp

v = Velocity of the drilling fluid = Q/A, i.e., flow rate/area of bore annulus, ft/sec

Q = flow rate of drilling fluid at drill bit, gal/min

d_{bore} = Diameter of bore hole, in

d_{pipe} = Diameter of drill or product pipe, in

Table 2 - Hydrofracture Evaluation Results

HDD Profile								Soil Group Bottom Elevation (ft)					Soil Group Thickness Above Bore (ft)					Soil Properties (Weighted Average)					Groundwater and Soil Pressure		Maximum Allowable Pressure		Minimum Required Downhole Pressure
Horizontal Distance from Entry Point (ft)	Station	Description	Ground Surface Elevation (ft)	Bore Elevation (ft)	h_{tot}, Depth of bore BGS (ft)	h_w, Depth of the bore below GW (ft)	h_{bore}, height of mud column (ft)	Soil Group No. 1	Soil Group No. 2	Soil Group No. 3	Soil Group No. 4	Soil Group No. 5	Soil Group No. 1	Soil Group No. 2	Soil Group No. 3	Soil Group No. 4	Soil Group No. 5	φ (deg)	G (lb/ft^2)	c (lb/ft^2)	γ (lb/ft^3)	γ' (lb/ft^3)	u (lb/ft^2)	σ_0' (lb/ft^2)	P_{max} (psf)	P_{max} (psi)	P_{min} (psi)
0.00	0+50.00	Entry (F)	42.08	42.08	0.00	0.00	0.00	30.5	22.5	18	0.5	-7.5	0.00	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	0	0	0	0.0
5.74	0+55.74	DH-1	42.18	40.54	1.64	0.00	1.54	30.5	22.5	18	0.5	-7.5	1.64	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	180.142161	3632.40643	25	1.1
10.12	0+60.12		42.24	39.37	2.87	0.00	2.71	30.5	22.5	18.0	0.5	-7.5	2.87	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	315.808828	4788.95837	33	1.9
10.50	0+60.50		42.25	39.27	2.98	0.00	2.81	30.5	22.5	18.0	0.5	-7.5	2.98	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	328.106393	4856.49901	34	1.9
10.61	0+60.61		42.25	39.24	3.01	0.00	2.84	30.5	22.5	18.0	0.5	-7.5	3.01	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	331.347793	4873.63921	34	2.0
12.67	0+62.67		42.25	38.69	3.56	0.00	3.39	30.5	22.5	18.0	0.6	-7.5	3.56	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	392.050381	5151.99614	36	2.3
12.88	0+62.88		42.59	38.63	3.96	0.00	3.45	30.5	22.5	18.0	0.6	-7.5	3.96	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	435.638508	5312.78462	37	2.4
12.96	0+62.96		42.74	38.61	4.13	0.00	3.47	30.5	22.5	18.0	0.6	-7.5	4.13	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	454.49589	5374.70967	37	2.4
13.41	0+63.41		42.75	38.49	4.26	0.00	3.59	30.5	22.5	18.0	0.6	-7.5	4.26	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	468.856164	5419.24923	38	2.5
13.59	0+63.59		42.75	38.44	4.31	0.00	3.64	30.5	22.5	18.0	0.6	-7.5	4.31	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	474.160274	5435.17251	38	2.5
26.63	0+76.63		42.47	34.95	7.52	0.00	7.13	30.6	22.6	18.1	0.7	-7.5	7.52	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	827.613546	6146.99388	43	4.9
27.54	0+77.54		42.37	34.70	7.67	0.00	7.38	30.6	22.6	18.1	0.7	-7.5	7.67	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	843.428767	6170.28046	43	5.1
29.75	0+79.75		42.44	34.11	8.33	0.00	7.97	30.6	22.6	18.1	0.7	-7.5	8.33	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	916.251446	6273.07249	44	5.5
32.67	0+82.67		42.55	33.33	9.22	0.00	8.75	30.6	22.6	18.1	0.7	-7.5	9.22	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	1014.39589	6402.55625	44	6.0
37.59	0+87.59		42.48	32.01	10.47	0.00	10.07	30.6	22.6	18.1	0.8	-7.5	10.47	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	1151.67489	6571.70187	46	6.9
37.61	0+87.61		42.48	32.00	10.48	0.00	10.08	30.6	22.6	18.1	0.8	-7.5	10.48	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	1152.26423	6572.40534	46	6.9
43.85	0+93.85		42.16	30.33	11.83	0.00	11.75	30.7	22.7	18.2	0.8	-7.5	11.49	0.34	0.00	0.00	0.00	0.89	44861.12	1311.42	110.43	48.03	0.00	1306.00998	7305.52741	51	8.1
45.94	0+95.94		41.94	29.77	12.17	0.00	12.31	30.7	22.7	18.2	0.8	-7.5	11.26	0.91	0.00	0.00	0.00	2.31	68776.57	1249.33	111.12	48.72	0.00	1351.93565	8017.88811	56	8.5
54.88	1+04.88		41.24	27.38	13.86	0.00	14.70	30.7	22.7	18.2	0.9	-7.5	10.52	3.34	0.00	0.00	0.00	7.47	155384.19	1024.48	113.62	51.22	0.00	1574.89904	10174.4725	71	10.1
59.13	1+09.13	E	41.26	26.24	15.02	0.00	15.84	30.7	22.7	18.2	0.9	-7.5	10.52	4.50	0.00	0.00	0.00	9.29	185790.16	945.54	114.49	52.09	0.00	1719.69908	11121.0697	77	10.9
64.13	1+14.13		41.28	24.93	16.35	0.00	17.15	30.8	22.8	18.3	1.0	-7.5	10.52	5.84	0.00	0.00	0.00	11.06	215580.88	868.20	115.35	52.95	0.00	1886.37383	12212.286	85	11.8
66.92	1+16.92		41.29	24.22	17.07	0.00	17.86	30.8	22.8	18.3	1.0	-7.5	10.52	6.56	0.00	0.00	0.00	11.91	229721.02	831.49	115.76	53.36	0.00	1976.28374	12806.6554	89	12.3
69.13	1+19.13		41.10	23.67	17.43	0.00	18.41	30.8	22.8	18.3	1.0	-7.5	10.32	7.12	0.00	0.00	0.00	12.66	242280.36	798.89	116.12	53.72	0.00	2024.15703	13259.1267	92	12.7
74.13	1+24.13		40.67	22.47	18.20	1.03	19.61	30.8	22.8	18.3	1.0	-7.5	9.86	8.00	0.34	0.00	0.00	13.62	258090.60	750.17	116.87	54.47	64.50	2063.05004	13844.9302	96	13.5
76.46	1+26.46		40.47	21.92	18.55	1.58	20.16	30.8	22.8	18.3	1.1	-7.5	9.65	8.00	0.89	0.00	0.00	13.37	253203.85	750.79	117.19	54.79	98.32	2075.10039	13747.5605	95	13.9
79.13	1+29.13		40.35	21.32	19.03	2.18	20.76	30.8	22.8	18.3	1.1	-7.5	9.52	8.00	1.51	0.00	0.00	13.03	246802.99	754.59	117.50	55.10	136.17	2099.54023	13651.1251	95	14.3
80.53	1+30.53		40.28	21.01	19.27	2.49	21.07	30.8	22.8	18.3	1.1	-7.5	9.44	8.00	1.83	0.00	0.00	12.87	243649.95	756.43	117.65	55.25	155.63	2111.97094	13603.7832	94	14.6
84.13	1+34.13		39.62	20.22	19.40	3.28	21.86	30.9	22.9	18.4	1.1	-7.5	8.77	8.00	2.63	0.00	0.00	12.78	241309.55	745.89	118.22	55.82	204.47	2089.02877	13452.4009	93	15.1
89.13	1+39.13		38.71	19.18	19.53	4.32	22.90	30.9	22.9	18.4	1.2	-7.5	7.84	8.00	3.69	0.00	0.00	12.70	238652.91	730.84	118.98	56.58	269.44	2054.28826	13251.1684	92	15.9
94.13	1+44.13		37.80	18.19	19.61	5.31	23.89	30.9	22.9	18.4	1.2	-7.5	6.90	8.00	4.50	0.20	0.00	12.96	241244.87	704.85	119.56	57.16	331.10	2013.17309	13193.3625	92	16.6
98.14	1+48.14		37.07	17.44	19.63	6.06	24.64	30.9	22.9	18.4	1.2	-7.5	6.15	8.00	4.50	0.98	0.00	14.12	257517.36	652.51	119.55	57.15	378.16	1968.67072	13546.0022	94	17.1
99.13	1+49.13		37.00	17.26	19.74	6.24	24.82	30.9	22.9	18.4	1.2	-7.5	6.08	8.00	4.50	1.16	0.00	14.33	260179.04	643.76	119.50	57.10	389.46	1969.62946	13642.5352	95	17.3
99.42	1+49.42		36.98	17.21	19.77	6.29	24.87	30.9	22.9	18.4	1.2	-7.5	6.06	8.00	4.50	1.21	0.00	14.39	260949.31	641.23	119.48	57.08	392.74	1969.89175	13670.5146	95	17.3
104.13	1+54.13		36.63	16.38	20.25	7.12	25.70	30.9	22.9	18.4	1.3	-7.5	5.69	8.00	4.50	2.07	0.00	15.31	273152.53	601.21	119.26	56.86	444.54	1970.67675	14103.337	98	17.9
109.13	1+59.13		36.25	15.55	20.71	7.95	26.53	31.0	23.0	18.5	1.3	-7.5	5.29	8.00	4.50	2.92	0.00	16.20	285089.37	562.12	119.05	56.65	496.37	1969.09679	14525.2082	101	18.6
112.53	1+62.53		36	15.01	20.99	8.49	27.07	31.0	23.0	18.5	1.3	-7.5	5.02	8.00	4.50	3.47	0.00	16.77	292687.86	537.27	118.93	56.53	529.76	1966.60906	14790.6492	103	19.0
114.13	1+64.13		36.01	14.77	21.24	8.73	27.31	31.0	23.0	18.5	1.4	-7.5	5.02	8.00	4.50	3.72	0.00	16.93	294518.31	531.01	118.83	56.43	544.95	1979.22336	14931.1584	104	19.2
119.13	1+69.13		36.04	14.04	22.00	9.46	28.04	31.0	23.0	18.5	1.4	-7.5	5.03	8.00	4.50	4.47	0.00	17.37	299735.21	513.17	118.52	56.12	590.31	2017.02021	15348.628	107	19.7
122.85	1+72.85		36.06	13.53	22.53	9.97	28.55	31.0	23.0	18.5	1.4	-7.5	5.03	8.00	4.50	4.99	0.00	17.66	303172.31	501.41	118.32	55.92	621.97	2043.55062	15638.462	109	20.2
124.13	1+74.13		36.08	13.36	22.72	10.14	28.72	31.0	23.0	18.5	1.4	-7.5	5.05	8.00	4.50	5.17	0.00	17.74	304076.18	498.26	118.25	55.85	632.45	2054.18498	15736.7637	109	20.3
129.13	1+79.13		36.18	12.74	23.44	10.76	29.34	31.1	23.1	18.6	1.5	-7.5	5.12	8.00	4.50	5.81	0.00	18.02	307269.58	487.10	118.00	55.60	671.40	2094.19424	16101.1045	112	20.8
134.13	1+84.13		36.27	12.17	24.10	11.33	29.91	31.1	23.1	18.6	1.5	-7.5	5.19	8.00	4.50	6.41	0.00	18.27	309977.09	477.61	117.78	55.38	707.16	2131.7721	16434.8362	114	21.3
135.13	1+85.13		36.29	12.06	24.23	11.44	30.02	31.1	23.1	18.6	1.5	-7.5	5.21	8.00	4.50	6.52	0.00	18.31	310465.53	475.90	117.74	55.34	713.93	2138.99666	16497.9837	115	21.4
137.94	1+87.94		36.11	11.76	24.35	11.74	30.32	31.1	23.1	18.6	1.5	-7.5	5.02	8.00	4.50	6.83	0.00	18.60	314442.01	462.99	117.70	55.30	732.27	2133.19006	16635.2931	116	21.6
140.13	1+90.13		36.12	11.55	24.57	11.95	30.53	31.1	23.1	18.6	1.6	-7.5	5.01	8.00	4.50	7.06	0.00	18.71	315727.68	458.60	117.63	55.23	745.87	2144.37668	16757.7669	116	21.8
145.13	1+95.13		36.13	11.09	25.05	12.41	30.99	31.1	23.1	18.6	1.6	-7.5	5.01	8.00	4.50	7.54	0.00	18.93	318385.22	449.55	117.49	55.09	774.65	2168.18225	17016.9938	118	22.3
150.13	2+00.13		36.15	10.67	25.48	12.83	31.41	31.1	23.1	18.6	1.6	-7.5	5.00	8.00	4.50	7.97	0.00	19.12	320687.03	441.70	117.36	54.96	800.28	2189.58055	17248.3035	120	22.6
155.13	2+05.13		36.17	10.31	25.85	13.19	31.77	31.2	23.2	18.7	1.7	-7.5	5.00	8.00	4.50	8.36	0.00	19.29	322664.87	434.97	117.25	54.85	822.76	2208.57755	17452.1828	121	23.0
160.13	2+10.13		36.18	10.00	26.18	13.50	32.08	31.2	23.2	18.7	1.7	-7.5	4.99	8.00	4.50	8.69	0.00	19.43	324344.71	429.25	117.16	54.76	842.10	2225.17844	17629.0493	122	23.3
165.13	2+15.13		36.20	9.75	26.46	13.75	32.33	31.2	23.2	18.7	1.8	-7.5	4.99	8.00	4.50	8.97	0.00	19.55	325747.60	424.47	117.09	54.69	858.30	2239.38768	17779.2554	123	23.6
170.13	2+20.13		36.22	9.54	26.68	13.96	32.54	31.2	23.2	18.7	1.8	-7.5	4.98	8.00	4.50	9.20	0.00	19.64	326890.45	420.59	117.03	54.63	871.37	2251.20899	17903.0919	124	23.9
175.13	2+25.13		36.24	9.38	26.86	14.12	32.70	31.3	23.3	18.8	1.8	-7.5	4.97	8.00	4.50	9.38	0.00	19.72	327786.52	417.54	116.98	54.58	881.32	2260.64539	18000.7903	125	24.2
179.57	2+29.57		36.25	9.28	26.97	14.22	32.80	31.3	23.3	18.8	1.9	-7.5	4.97	8.00	4.50	9.50	0.00	19.77	328383.53	415.52	116.95	54.55	887.53	2267.02756	18065.7781	125	24.4
180.13	2+30.13		36.26	9.27	26.99	14.23	32.81	31.3	23.3	18.8	1.9	-7.5	4.97	8.00	4.50	9.52	0.00	19.77	328409.86	415.42	116.95	54.55	888.14	2268.05713	18072.9704	126	24.4
185.13	2+35.13		36.30	9.21	27.09	14.29	32.87	31.3	23.3	18.8	1.9	-7.5	4.99	8.00	4.50	9.60	0.00	19.78	328519.13	414.97	116.92	54.52	891.84	2275.92606	18122.8043	126	24.6
188.29	2+38.29		36.33	9.20	27.13	14.30	32.88	31.3	23.3	18.8	1.9	-7.5	5.01	8.00	4.50	9.62	0.00	19.78	328472.35	415.09	116.91	54.51	892.57	2279.67168	18140.9804	126	24.7
188.56	2+38.56	D	36.34	9.20	27.14	14.30	32.88	31.3	23.3	18.8	1.9	-7.5	5.02	8.00	4.50	9.63	0.00	19.77	328381.50	415.37	116.91	54.51	892.58	2280.77516	18143.0669	126	24.7
198.90	2+48.90		36.82	9.20	27.62	14.30	32.88	31.4	23.4	18.9	2.0	-7.5	5.45	8.00	4.50	9.67	0.00	19.48	323903.30	429.34	116.79	54.39	892.58	2333.57516	18231.5764	127	25.0
209.84	2+59.84		36.4	9.20	27.20	14.30	32.88	31.4	23.4	18.9	2.1	-7.5	4.98	8.00	4.50	9.72	0.00	19.84	329199.88	412.68	116.89	54.49	892.58	2287.37516	18206.6968	126	25.4
210.32	2+60.32		36.3	9.20	27.10	14.30	32.88	31.4	23.4	18.9	2.1	-7.5	4.88	8.00	4.50	9.72	0.00	19.91	330337.20	409.12	116.92	54.52	892.58	2276.37516	18194.452	126	25.4
228.88	2+78.88		36.41	9.20	27.21	14.30	32.88	31.5	23.5	19.0	2.3	-7.5	4.91	8.00	4.50	9.81	0.00	19.92	330410.51	408.78	116.89	54.49	892.58	2288.47516	18257.898	127	26.0
230.67	2+80.67		34.9	9.20	25.70	14.30	32.88	31.5	23.5	19.0	2.3	-7.5	3.39	8.00	4.50	9.81	0.00	21.10	348189.72	353.07	117.29	54.89	892.58	2122.37516	18022.2228	125	26.0
237.07	2+87.07		30.51	9.20	21.31	14.30	32.88	30.5	23.5	19.0	2.3	-7.5	0.00	6.97	4.50	9.84	0.00	23.99	389173.53	211.13	118.07	55.67	892.58	1624.03093	15993.134	111	26.2
244.62	2+94.62		29.1	9.20	19.90	14.30	32.88	29.1	23.6	19.1	2.4	-7.5	0.00	5.53	4.50	9.88	0.00	23.50	377610.16	226.08	117.56	55.16	892.58	1447.27198	14522.624	101	26.4
250.76	3+00.76		29.17	9.20	19.97	14.30	32.88	29.2	23.6	19.1	2.4	-7.5	0.00	5.57	4.50	9.91	0.00	23.52	378076.16	225.29	117.56	55.16	892.58	1455.60807	14590.8344	101	26.6

HDD Profile								Soil Group Bottom Elevation (ft)					Soil Group Thickness Above Bore (ft)					Soil Properties (Weighted Average)					Groundwater and Soil Pressure		Maximum Allowable Pressure		Minimum Required Downhole Pressure
Horizontal Distance from Entry Point (ft)	Station	Description	Ground Surface Elevation (ft)	Bore Elevation (ft)	h_{tot}, Depth of bore BGS (ft)	h_w, Depth of the bore below GW (ft)	h_{bore}, height of mud column (ft)	Soil Group No. 1	Soil Group No. 2	Soil Group No. 3	Soil Group No. 4	Soil Group No. 5	Soil Group No. 1	Soil Group No. 2	Soil Group No. 3	Soil Group No. 4	Soil Group No. 5	φ (deg)	G (lb/ft^2)	c (lb/ft^2)	γ (lb/ft^3)	γ' (lb/ft^3)	u (lb/ft^2)	σ_0' (lb/ft^2)	P_{max} (psf)	P_{max} (psi)	P_{min} (psi)
254.90	3+04.90		29.12	9.20	19.92	14.30	32.88	29.1	23.6	19.1	2.5	-7.5	0.00	5.50	4.50	9.92	0.00	23.50	377551.33	225.86	117.53	55.13	892.58	1449.07899	14536.2464	101	26.8
262.11	3+12.11		29.17	9.20	19.97	14.30	32.88	29.2	23.7	19.2	2.5	-7.5	0.00	5.52	4.50	9.96	0.00	23.52	377820.79	225.29	117.52	55.12	892.58	1454.84295	14583.0196	101	27.0
265.56	3+15.56		29.06	9.20	19.86	14.30	32.88	29.1	23.7	19.2	2.5	-7.5	0.00	5.39	4.50	9.97	0.00	23.48	376789.28	226.54	117.47	55.07	892.58	1440.86039	14466.8717	100	27.1
268.22	3+18.22		29.12	9.20	19.92	14.30	32.88	29.1	23.7	19.2	2.6	-7.5	0.00	5.44	4.50	9.98	0.00	23.50	377250.89	225.86	117.48	55.08	892.58	1448.18107	14527.0876	101	27.2
274.44	3+24.44	C	29.36	9.20	20.16	14.30	32.88	29.4	23.7	19.2	2.6	-7.5	0.00	5.65	4.50	10.01	0.00	23.59	379168.38	223.17	117.55	55.15	892.58	1477.76177	14771.2591	103	27.4
275.45	3+25.45		29.4	9.20	20.20	14.30	32.88	29.4	23.7	19.2	2.6	-7.5	0.00	5.69	4.50	10.02	0.00	23.60	379480.56	222.74	117.56	55.16	892.51	1482.64513	14811.4225	103	27.4
279.44	3+29.44		30.46	9.22	21.24	14.28	32.86	30.5	23.7	19.2	2.7	-7.5	0.00	6.73	4.50	10.01	0.00	23.96	387841.14	211.85	117.93	55.53	891.02	1613.96955	15898.5499	110	27.5
284.44	3+34.44		31.79	9.30	22.50	14.20	32.78	31.8	23.8	19.3	2.7	-7.5	0.04	8.00	4.50	9.96	0.00	24.30	396199.85	202.43	118.33	55.93	886.34	1775.79565	17213.9196	120	27.6
289.44	3+39.44		33.12	9.42	23.70	14.08	32.66	31.8	23.8	19.3	2.7	-7.5	1.35	8.00	4.50	9.85	0.00	22.94	375755.29	266.65	117.91	55.51	878.53	1916.21799	17623.044	122	27.7
294.44	3+44.44		34.45	9.60	24.86	13.90	32.48	31.8	23.8	19.3	2.8	-7.5	2.66	8.00	4.50	9.70	0.00	21.68	357103.17	325.30	117.54	55.14	867.61	2054.25707	17881.1292	124	27.8
299.44	3+49.44		35.78	9.82	25.96	13.68	32.26	31.8	23.8	19.3	2.8	-7.5	3.96	8.00	4.50	9.50	0.00	20.53	339896.04	379.47	117.22	54.82	853.55	2189.91036	18025.3129	125	27.8
304.44	3+54.44		37.12	10.10	27.02	13.40	31.98	31.8	23.8	19.3	2.8	-7.5	5.27	8.00	4.50	9.25	0.00	19.44	323860.45	430.02	116.94	54.54	836.37	2323.17463	18081.3175	126	27.8
309.44	3+59.44		38.45	10.42	28.02	13.08	31.66	31.9	23.9	19.4	2.9	-7.5	6.58	8.00	4.50	8.94	0.00	18.42	308777.48	477.61	116.69	54.29	816.04	2454.04593	18067.1161	125	27.8
314.44	3+64.44		39.78	10.80	28.98	12.70	31.28	31.9	23.9	19.4	2.9	-7.5	7.89	8.00	4.50	8.59	0.00	17.45	294468.98	522.83	116.47	54.07	792.58	2582.51958	17995.3973	125	27.7
315.58	3+65.58		40.08	10.89	29.19	12.61	31.19	31.9	23.9	19.4	2.9	-7.5	8.19	8.00	4.50	8.50	0.00	17.23	291299.24	532.85	116.42	54.02	786.78	2611.47536	17971.9917	125	27.7
316.79	3+66.79		40.73	10.99	29.74	12.51	31.09	31.9	23.9	19.4	2.9	-7.5	8.83	8.00	4.50	8.41	0.00	16.82	285123.53	552.28	116.31	53.91	780.46	2678.14982	17965.5394	125	27.7
317.41	3+67.41		40.85	11.05	29.80	12.45	31.03	31.9	23.9	19.4	3.0	-7.5	8.95	8.00	4.50	8.35	0.00	16.73	283841.90	556.35	116.29	53.89	777.15	2688.82264	17947.1526	125	27.7
318.65	3+68.65		40.86	11.15	29.71	12.35	30.93	31.9	23.9	19.4	3.0	-7.5	8.95	8.00	4.50	8.25	0.00	16.68	283228.25	558.40	116.31	53.91	770.37	2684.75726	17894.8684	124	27.6
319.44	3+69.44		40.86	11.23	29.63	12.27	30.85	31.9	23.9	19.4	3.0	-7.5	8.95	8.00	4.50	8.18	0.00	16.66	282906.23	559.49	116.33	53.93	765.96	2681.05597	17860.0999	124	27.6
324.44	3+74.44		40.84	11.70	29.14	11.80	30.38	31.9	23.9	19.4	3.0	-7.5	8.91	8.00	4.50	7.73	0.00	16.47	280660.01	567.09	116.44	54.04	736.18	2656.23406	17623.9798	122	27.5
329.44	3+79.44		40.82	12.23	28.59	11.27	29.85	32.0	24.0	19.5	3.0	-7.5	8.86	8.00	4.50	7.22	0.00	16.26	278031.14	575.97	116.56	54.16	703.24	2628.99594	17359.6784	121	27.4
334.44	3+84.44		40.80	12.81	27.99	10.69	29.27	32.0	24.0	19.5	3.1	-7.5	8.82	8.00	4.50	6.67	0.00	16.01	274981.85	586.27	116.70	54.30	667.12	2599.33389	17066.5218	119	27.2
339.44	3+89.44		40.78	13.44	27.34	10.06	28.64	32.0	24.0	19.5	3.1	-7.5	8.78	8.00	4.50	6.06	0.00	15.72	271466.37	598.13	116.86	54.46	627.81	2567.23943	16743.7354	116	27.0
344.44	3+94.44		40.76	14.12	26.64	9.38	27.96	32.0	24.0	19.5	3.2	-7.5	8.74	8.00	4.50	5.40	0.00	15.39	267429.04	611.75	117.04	54.64	585.30	2532.70326	16390.4297	114	26.8
349.44	3+99.44		40.74	14.85	25.89	8.65	27.23	32.0	24.0	19.5	3.2	-7.5	8.70	8.00	4.50	4.69	0.00	15.02	262801.99	627.35	117.24	54.84	539.58	2495.7153	16005.5826	111	26.5
354.44	4+04.44		40.72	15.64	25.09	7.86	26.44	32.1	24.1	19.6	3.2	-7.5	8.66	8.00	4.50	3.93	0.00	14.59	257501.91	645.20	117.47	55.07	490.63	2456.26463	15588.0158	108	26.2
357.77	4+07.77		40.71	16.19	24.52	7.31	25.89	32.1	24.1	19.6	3.3	-7.5	8.63	8.00	4.50	3.39	0.00	14.27	253548.90	658.52	117.65	55.25	456.23	2428.61845	15291.0997	106	26.0
359.44	4+09.44		40.67	16.47	24.20	7.03	25.61	32.1	24.1	19.6	3.3	-7.5	8.58	8.00	4.50	3.12	0.00	14.11	251710.12	664.79	117.75	55.35	438.43	2410.92237	15134.1531	105	25.9
360.89	4+10.89		40.64	16.73	23.91	6.77	25.35	32.1	24.1	19.6	3.3	-7.5	8.54	8.00	4.50	2.87	0.00	13.97	250033.82	670.50	117.84	55.44	422.68	2395.3325	14994.616	104	25.8
362.35	4+12.35		40.62	16.98	23.64	6.52	25.10	32.1	24.1	19.6	3.3	-7.5	8.52	8.00	4.50	2.62	0.00	13.82	248149.34	676.89	117.93	55.53	406.55	2380.82666	14851.9335	103	25.7
364.44	4+14.44		40.61	17.36	23.25	6.14	24.72	32.1	24.1	19.6	3.3	-7.5	8.50	8.00	4.50	2.25	0.00	13.57	245127.79	687.07	118.07	55.67	382.97	2361.79071	14643.5972	102	25.5
364.54	4+14.54		40.61	17.38	23.23	6.12	24.70	32.1	24.1	19.6	3.3	-7.5	8.50	8.00	4.50	2.23	0.00	13.56	244978.66	687.57	118.07	55.67	381.83	2360.86896	14633.4655	102	25.5
369.44	4+19.44		40.59	18.30	22.29	5.20	23.78	32.1	24.1	19.6	3.4	-7.5	8.46	8.00	4.50	1.33	0.00	12.92	237098.99	714.11	118.41	56.01	324.24	2314.7	14118.3985	98	25.1
371.77	4+21.77		40.58	18.76	21.82	4.74	23.32	32.1	24.1	19.6	3.4	-7.5	8.44	8.00	4.50	0.88	0.00	12.58	232936.55	728.12	118.59	56.19	295.74	2291.89969	13860.1924	96	25.0
374.44	4+24.44		40.55	19.30	21.25	4.20	22.78	32.2	24.2	19.7	3.4	-7.5	8.39	8.00	4.50	0.36	0.00	12.18	227993.50	744.83	118.82	56.42	262.21	2262.7503	13551.6383	94	24.7
379.44	4+29.44		40.49	20.35	20.14	3.15	21.73	32.2	24.2	19.7	3.4	-7.5	8.31	8.00	3.83	0.00	0.00	12.31	232159.00	747.17	118.81	56.41	196.86	2196.23423	13406.3967	93	24.3
384.44	4+34.44		40.43	21.45	18.98	2.05	20.63	32.2	24.2	19.7	3.5	-7.5	8.22	8.00	2.76	0.00	0.00	13.07	245836.73	730.16	118.50	56.10	128.17	2120.98373	13530.2493	94	23.8
389.44	4+39.44		40.37	22.60	17.76	0.90	19.48	32.2	24.2	19.7	3.5	-7.5	8.14	8.00	1.62	0.00	0.00	13.96	262068.64	710.06	118.13	55.73	56.12	2042.36132	13679.2054	95	23.3
394.44	4+44.44		40.30	23.81	16.50	0.00	18.27	32.2	24.2	19.7	3.6	-7.5	8.06	8.00	0.44	0.00	0.00	15.03	281584.70	685.98	117.67	55.27	0.00	1941.03287	13812.8636	96	22.8
399.44	4+49.44		40.24	25.07	15.17	0.00	17.01	32.3	24.3	19.8	3.6	-7.5	7.97	7.20	0.00	0.00	0.00	14.70	276661.97	709.63	117.12	54.72	0.00	1776.74905	13100.8802	91	22.2
403.88	4+53.88	B	40.19	26.24	13.95	0.00	15.84	32.3	24.3	19.8	3.6	-7.5	7.90	6.05	0.00	0.00	0.00	13.44	255468.23	764.65	116.50	54.10	0.00	1625.0948	12096.0057	84	21.7
407.13	4+57.13		40.15	27.11	13.04	0.00	14.97	32.3	24.3	19.8	3.7	-7.5	7.85	5.19	0.00	0.00	0.00	12.34	237070.35	812.41	115.97	53.57	0.00	1512.06076	11362.2622	79	21.3
409.34	4+59.34		40.28	27.70	12.58	0.00	14.38	32.3	24.3	19.8	3.7	-7.5	7.97	4.61	0.00	0.00	0.00	11.36	220605.53	855.16	115.50	53.10	0.00	1452.48962	10899.1618	76	21.0
415.80	4+65.80		40.66	29.44	11.22	0.00	12.64	32.3	24.3	19.8	3.7	-7.5	8.32	2.91	0.00	0.00	0.00	8.03	164703.78	1000.29	113.89	51.49	0.00	1278.35857	9557.73632	66	20.2
418.29	4+68.29		40.67	30.10	10.57	0.00	11.98	32.4	24.4	19.9	3.7	-7.5	8.32	2.25	0.00	0.00	0.00	6.61	140801.58	1062.34	113.20	50.80	0.00	1196.22818	9005.36686	63	19.9
418.39	4+68.39		40.68	30.13	10.55	0.00	11.95	32.4	24.4	19.9	3.7	-7.5	8.33	2.23	0.00	0.00	0.00	6.54	139679.53	1065.26	113.16	50.76	0.00	1193.9856	8984.11343	62	19.9
421.29	4+71.29		40.73	30.91	9.82	0.00	11.17	32.4	24.4	19.9	3.8	-7.5	8.36	1.46	0.00	0.00	0.00	4.61	107355.93	1149.17	112.23	49.83	0.00	1102.55061	8301.69504	58	19.6
428.20	4+78.20		40.82	32.76	8.06	0.00	9.32	32.4	24.4	19.9	3.8	-7.5	8.06	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	886.863467	6232.39782	43	18.7
428.80	4+78.80		40.68	32.92	7.76	0.00	9.16	32.4	24.4	19.9	3.8	-7.5	7.76	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	853.77902	6185.31823	43	18.7
433.94	4+83.94		41.14	34.30	6.84	0.00	7.78	32.4	24.4	19.9	3.9	-7.5	6.84	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	752.882263	6031.1063	42	18.0
436.79	4+86.79		41.18	35.06	6.12	0.00	7.02	32.4	24.4	19.9	3.9	-7.5	6.12	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	673.281143	5893.8835	41	17.7
442.58	4+92.58		41.06	36.61	4.45	0.00	5.47	32.5	24.5	20.0	3.9	-7.5	4.45	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	489.426235	5479.52269	38	17.0
446.29	4+96.29		41.07	37.60	3.47	0.00	4.48	32.5	24.5	20.0	4.0	-7.5	3.47	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	381.177408	5107.37943	35	16.5
448.05	4+98.05		41.18	38.08	3.10	0.00	4.00	32.5	24.5	20.0	4.0	-7.5	3.10	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	341.403032	4925.16041	34	16.3
450.77	5+00.77	DH-2	41.6	38.81	2.79	0.00	3.27	32.5	24.5	20	4	-7.5	2.79	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	307.433541	4740.54239	33	16.0
454.08	5+04.08		42.12	39.69	2.43	0.00	2.39	32.5	24.5	20	4	-7.5	2.43	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	267.074345	4475.00809	31	15.6
458.41	5+08.41		42.83	40.85	1.98	0.00	1.23	32.5	24.5	20	4	-7.5	1.98	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	217.551591	4053.18337	28	15.0
459.16	5+09.16		42.93	41.05	1.88	0.00	1.03	32.5	24.5	20	4	-7.5	1.88	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	206.446033	3939.25585	27	15.0
461.83	5+11.83		43.16	41.77	1.39	0.00	0.31	32.5	24.5	20	4	-7.5	1.39	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	153.050246	3247.94291	23	14.6
469.15	5+19.15	Exit (A)	43.73	43.73	0.00	0.00	-1.65	32.5	24.5	20	4	-7.5	0.00	0.00	0.00	0.00	0.00	0.00	30000.00	1350.00	110.00	47.60	0.00	0	0	0	13.7

Appendix F

Calculations of Settlement Risk below Sanitary Sewer Siphon

Settlement Risk below Sanitary Sewer Siphon

Maximum Settlement Above the Bore Centerline:

$$\Delta h_{CL} = V_s / w$$

where:

$$w = \frac{d_b}{2} + \left(h_c + \frac{d_b}{2}\right) \cdot \tan\left(45 - \frac{\varphi}{2}\right)$$

and

$$V_a = \frac{\pi}{4} \cdot \left({d_b}^2 - {d_o}^2\right)$$

and

h_c (ft)	14.75	Depth of clearance from sewer above crown of the bore (not the pipe) (Assumed)
d_b (in)	16.125	Diameter of the bore
d_p (in)	10.75	Diameter of the product pipe
φ (deg)	18	At station 1+74

V_a (in^3/in)	113.5	Volume of the annulus per unit of the bore length
V_s (in^3/in)	56.7	Settlement trough volume per unit of bore length (assumed to equal 0.5*V_a)
w (in)	142.5	Settlement trough half width
Δh_{CL} (in)	0.40	Settlement trough depth at centerline (maximum settlement)

APPENDIX B – ARCHAEOLOGICAL SURVEY REPORT

Due to sensitive information contained within the Archaeological Survey Report, this report is not available for public release but is on file with the Coastside County Water District.

APPENDIX C – RESPONSES TO COMMENTS

RESPONSES TO COMMENTS ON THE INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Introduction

This document contains comments received during the public review period of the Water Line Replacement under Pilarcitos Creek at Starflower Village Project (proposed Project) Initial Study/Mitigated Negative Declaration (IS/MND) and provides responses to those comments.

Background

The Coastside County Water District (District), as lead agency, released the IS/MND for a 60-day public review and comment period that began on August 5, 2021, and ended on October 4, 2021, pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15105. The IS/MND and supporting documents were made available on the District's website, at https://www.coastsidewater.org/ and CEQAnet, the State Clearinghouse website (SCH No. 2021080099).

In accordance with CEQA Guidelines Sections 15073 and 15074, the lead agency must consider the comments received during consultation and review periods together with the negative declaration. However, unlike with an Environmental Impact Report, comments received on a negative declaration are not required to be attached to the negative declaration, nor must the lead agency provide specific written responses to comments received during the public review and comment period. Nonetheless, the District has chosen to provide responses to the comments received during the public review period for the IS/MND.

Recirculation of the IS/MND pursuant to CEQA Guidelines Sections 15073.5 is not required as no substantial revisions to the IS/MND have been made in response to public comments or for any other reason.

List of Commenters

The District received two (2) comment letters during the 60-day public review period on the IS/MND for the proposed Project was closed:

- Comment Letter 1 – Sylvia Targ, Coastal Planner, California Coastal Commission (received via email on October 4, 2021)
- Comment Letter 2 – Douglas Garrison, Senior Planner, City of Half Moon Bay (received via email on October 4, 2021)

Response to Comments

Letter L1: Sylvia Targ, Coastal Planner, California Coastal Commission

Comment L1-1: I have reviewed the Pilarcitos Creek Crossing BRE and ISMND, and the Coastal Commission is in support of the proposed mitigation measures that would protect the creek habitat, including the frac-out protocols described.

Response to Comment L1-1: Thank you for your comment, your support to the proposed Project has been considered.

Letter L2: Douglas Garrison, Senior Planner, City of Half Moon Bay

Comment L2-1: The City's comments on the Water Line Replacement Under Pilarcitos Creek at Strawflower Village IS/MND are attached. The comments are embedded in the original PDF as sticky notes. Comments generally fall within the following categories.

Response to Comment L2-1: The comments embedded in the original PDF are summarized in Table 1 below along with responses to each comment.

Table 1 Summary of Comments Received

Comment Location in the Draft IS/MND	Comment Received	Response to Comment/Changes made in Final IS/MND
Section 1.3, Best Management Practices (page 1-6)	Oak Avenue is a dead end street with residences on the south frontage. There are no feasible detours that would provide access to the residences.	The final construction drawings for the Project will require the contractor to maintain a minimum 20-foot wide travel lane on Pilarcitos Avenue and Oak Avenue at all times during construction to provide access for residents and emergency vehicles. The Final IS/MND has been modified to reflect this language (pages 1-6, 4-41, 4-59, and 4-60.
Section 4.1, Aesthetics, Environmental Setting discussion (page 4-2)	This appears to be an outdated citation that refers to the 1993 LUP. This has been superseded by the updated LCP, adopted in 2020. Visual Resources are now addressed in Chapter 9. Please cite the correct version and check the rest of the document to ensure current policies are cited. Please also note that the Zoning Code is the City's Implementation Plan for the LCP. The City is updating it to ensure consistency with the current LCP. In the interim, when there are inconsistencies between the two documents, the policies in the LCP apply. Examples include definitions and policies concerning riparian areas and visual resource areas.	The text in Section 4.1, pages 4-2 and 4-3, has been revised as follows: The City's Local Coastal Program/Land Use Plan (LCP/LUP) and Zoning Code includes policies and standards addressing visual resources in the City. Chapter ~~7~~9, Scenic and Visual Resources, of the LCP/LUP addresses the protection of views of scenic areas and visual resources visible from public roads and trails. The LCP/LUP also includes a ~~Visual Resource Overlay Map~~ Scenic & Visual Resource Areas map that identifies existing visual resources located throughout the City Land Use polices included in the 2020 LUP have been updated in Section 4.11, pages 4-46 to 4-48.
Section 4.1, Aesthetics, Discussion of Impact a) (page 4-3)	This appears to be a reference to the 1993 LCP. The updated 2020 LCP has a more	The text in Section 4.1, page 4-3, has been revised as follows:

	comprehensive and nuanced approach to identifying visual resources. Pilarcitos Creek and associated riparian vegetation is now considered a visual resource.	According to the Scenic & Visual Resource Area map ~~Visual Resources Overlay Map~~ in the LCP/LUP, there are no designated ~~shoreline~~ scenic coastal access routes from or through the proposed Project Area. The LCP/LUP considers riparian corridors significant plant communities that serve to visually frame the surrounding scenery in addition to providing local landmarks and place-identifiers. The proposed Project is completely underground and would not introduce an incompatible visual element to the site or surrounding area. During the construction phase, the truck loading area behind Safeway and a portion of Oak Park would be disturbed to install the pipeline which would temporarily modify views from nearby residential properties and access roads to the Pilarcitos Creek riparian corridor.
Section 4.3, Air Quality, Discussion of Impacts a) and b) (page 4-8)	Conclusion is not supported by evidence. At minimum a description of the types of heavy equipment that would be used and duration of use should be provided. The BAAQMD has developed screening thresholds for temporary construction project emissions in their CEQA Air Quality Guidelines. Given the relatively small scale of this project, emissions are likely to be below the thresholds of significance. It would be better to cite specific BAAQMD guidance.	The text in Section 4.3, pages 4-8 to 4-9, has been revised as follows: Construction activities would result in short-term increases in emissions from the use of vehicles and heavy equipment, including excavators, drill rigs, front loaders, mud mixing plants, and separation plants, which ~~that~~ generate~~s~~ dust, exhaust, and tire-wear emissions; soil disturbance; materials used in construction; and construction traffic. Project construction would produce fugitive dust (PM_{10} and $PM_{2.5}$) during ground disturbance and would generate carbon monoxide, ozone precursors, and other emissions from vehicle and equipment operation. BAAQMD has developed preliminary screening criteria to provide lead agencies with a way to identify whether a proposed project could result in potentially significant air quality impacts. The screening levels generally represent new development on undeveloped sites without any form of mitigation measures taken into consideration. If a proposed project meets all of the screening criteria, then the lead agency would not need to perform a detailed air quality assessment of project air pollutant emissions, and the construction of the project would result in a less-than-significant impact from criteria air pollutant and precursor emissions. The BAAQMD screening criteria include the following: 1. The project is below the construction and operational screening size (Table 3-1 of BAAQMD CEQA Guidelines); 2. The project design and implementation includes all BAAQMD Basic Construction Mitigation Measures; 3. Construction-related activities would not include any of the following: a. Demolition;

		b. Simultaneous occurrence of more than two construction phases (e.g., paving and building construction would occur simultaneously); c. Simultaneous construction of more than one land use type (e.g., the project would develop residential and commercial uses on the same site); d. Extensive site preparation (i.e., greater than default assumptions used by the Urban Land Use Emissions Model [URBEMIS] for grading, cut/fill, or earth movement); or e. Extensive material transport (e.g., greater than 10,000 cubic yards of soil import/export) requiring a considerable amount of haul truck activity. The Project meets the BAAQMD screening criteria listed above and therefore would not need to be modeled for construction or operational emissions. BMPs recommended by BAAQMD and identified above in the Project Description would be implemented during construction to minimize fugitive dust. All pipeline improvement activities would take place within ~~existing roads~~ developed or maintained park areas, within a developed community. Construction emissions would be relatively low and temporary, lasting approximately two months, and would not have long-term effects on air quality at the proposed Project Area, in the project vicinity, or within the Bay Area. Construction-related activities would not include demolition, simultaneous occurrences of more than two construction phases, simultaneous construction of more than one land use type, extensive site preparation, and import/export of greater than 10,000 cubic yards of soil or any extensive material transport requiring a considerable amount of haul truck activity. Because of the small area of disturbance, temporary nature of the emissions, and implementation of construction measures, Project activities would not result in the generation of construction-related criteria air pollutants and/or precursors that exceed the Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors shown in Table 3-1 of BAAQMD's CEQA Guidelines. I~~i~~mpacts on air quality would be less than significant and the Project would comply with the Bay Area 2017 Clean Air Plan.
Section 4.3, Air Quality, Discussion of Impact c) (page 4-9)	Identify what Tier level equipment the contractor be required to use?	The text in Section 4.3, page 4-9, has been revised as follows: Basic construction measures recommended by BAAQMD, listed in the Project Description, would be implemented during construction to minimize air pollutants. ~~New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g., 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit~~

		~~requirements required by the California Code of Regulation (CCR; 13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116).~~ The District would require the contractor to use the latest model (Tier 4) engines for construction equipment. As a result, sensitive receptors in the vicinity of the proposed Project would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.
Section 4.4, Biological Resources, Environmental Setting discussion (page 4-11)	This may be referring to the 1993 LCP definition. Please confirm that the analysis is based on 2020 LCP definitions and policies.	The text in Section 4.4, page 4-12, has been revised as follows: The overstory of the Project Area consisted of ~~more than 50 percent of~~ riparian species including red alder, arroyo willow, and alder that contribute to the function and distinction of the riparian habitat; accordingly, the vegetation within the proposed Project Area meets the CCC/Half Moon Bay LCP definition of riparian corridor.
Section 4.4, Biological Resources, Regulatory Setting discussion (page 4-19)	1993 LCP has been superseded by the 2020 updated LCP.	The text on page 4-20 has been revised as follows: The City's LCP outlines permitted uses within specific ESHAs. Permitted uses within riparian corridors and riparian corridor buffers, such as the habitat associated with Pilarcitos Creek, include necessary water supply projects (City of Half Moon Bay ~~1993~~2020).
Section 4.4, Biological Resources, Discussion of Impact a) (page 4-21)	Although the potential for impacts to CRLF and other species may be low. The effects caused by frac-outs are identified as potentially significant and requiring mitigation. MM BIO-3 does not include measurable standards that would ensure that impacts would be reduced to a less than significant level. Additionally, if any of the activities proposed in MM BIO-3 will require working within and potentially damaging riparian areas or the creek itself, this should be	As stated in the IS/MND, the HDD crossing has been designed to minimize the risk of frac-outs and frac-outs are unlikely to occur (see Preliminary Design Report, Appendix F). The magnitude of potential frac-out events are discussed in the description of the proposed Project (pages 1-3 and 1-4) and in the biological resources impact analysis on pages 4-22 and 4-25. Generally a frac-out event results in a relatively small release of sediment-laden water before it is contained. The qualified biological monitor that will be onsite for drilling operations will be consulted to ensure that any immediate response and containment actions minimize impacts to sensitive habitat and species. Measurable standards for prevention of a frac-out event and immediate response should a frac-out occur will be included in the Frac-out and Surface Spill Prevention Plan, to be prepared prior to construction. Additionally, should a frac-out event occur and remedial actions be warranted, a mitigation plan would be developed containing measurable performance standards to ensure any damage to the riparian area, creek, or sensitive species habitat are restored to pre-construction conditions or better. These measures will ensure that the appropriate actions are taken to ensure that no

	discussed in the impact analysis.	significant impacts to riparian areas, the creek, CRLF or other sensitive habitat would occur. The text on page 4-23 (Mitigation Measure BIO-3) has been revised as follows: Although the risk of frac-outs was identified as low, the HDD contractor shall prepare a Frac-out and Surface Spill Prevention Plan, based on information contained in the HDD Specifications section 02413, prepared by EKI and dated April 2021. The Frac-out Plan shall be ~~submitted to the City for approval~~ prepared prior to construction. ~~the issuance of the grading permit, and the contractor shall submit a letter signed by an authorized representative confirming that the plan will be followed during all HDD activity~~. The text on page 4-24 (Mitigation Measure BIO-3) has been revised as follows: ~~The performance standard for this mitigation measure is that~~ ~~I~~if a frac-out event occurs, the qualified biological monitor present during drilling operations shall be consulted to minimize disturbance to sensitive species and habitat during any immediate response and containment actions. Following containment, a qualified biologist shall document any adverse impact to sensitive habitat or species to help inform whether remedial actions may be warranted. If remedial actions are warranted, in consultation with the City and any relevant regulatory agencies, a mitigation plan will be developed with the proposed remedial actions and measurable performance standards to ensure adversely affected habitat is restored to pre-construction conditions or better. The mitigation plan will be submitted to ~~cleanup, surveys, photographs, agency or consultant recommendations, and a mitigation plan shall be submitted to~~ the City of Half Moon Bay and any relevant regulatory ~~permitting~~ agencies within 30 days of the event for review and approval. ~~Measures taken might include habitat restoration efforts, or surveys of special status species to assess impacts of the frac-out event.~~ The C~~e~~ity and relevant regulatory agencies shall inspect and approve any remedial actions taken by the Lead Agency to respond to the frac-out event.
Section 4.4, Biological Resources, Mitigation Measure BIO-1 (page 4-21)	Why 15 Ft? It seems like it should be stated that excavation on the northern end will be within a paved shopping center parking lot and the southern end will be	No vegetation removal or ground disturbance is planned within 15 ft of the top of the creek bank. Out of an abundance of caution, a minimum distance of 15 feet above the top of bank is included to minimize the potential for accidental encroachment into sensitive habitat areas. A qualified biological monitor will be present during drilling operations to ensure drilling operations do not affect sensitive species or habitat.

	in a maintained lawn area. There shouldn't be any low lying mesic areas located there. This Mitigation Measure doesn't seem to actually mitigate an impact. ESESHA	On page 4-23, Mitigation Measure BIO-1, has been revised as follows: All vegetation removal~~,~~ and construction-related ground disturbance~~, and other construction activities~~ shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas.~~to avoid low-lying mesic areas on the fringe of the creek.~~ A qualified biologist will monitor all drilling operations to ensure sensitive species and habitat are avoided.
Section 4.4, Biological Resources, Mitigation Measure BIO-1 (page 4-21)	LCP policies typically require at minimum a 20 foot setback and frequently require 50 to 100 feet. Provide a justification for using 15 feet.	The LCP/LUP establishes a buffer zone that extends a minimum of 50 feet from the outer limit of riparian vegetation along perennial watercourses, including Pilarcitos Creek (refer to Policy 6-49 on page 4-47) (City of Half Moon Bay 2020). Permitted uses within riparian corridors and riparian corridor buffers include necessary water supply projects, which includes this project (refer to Policy 6-47-d on page 4-47 and Policy 6-51-a on 4-47) (City of Half Moon Bay 2020). On page 4-23, Mitigation Measure BIO-1, has been revised as follows: All vegetation removal~~,~~ and construction-related ground disturbance~~, and other construction activities~~ shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas.~~to avoid low-lying mesic areas on the fringe of the creek.~~ A qualified biologist will monitor all drilling operations to ensure sensitive species and habitat are avoided.
Section 4.4, Biological Resources, Discussion of Impact b) (page 4-23)	See previous comment.	See response to previous comment
Section 4.4, Biological Resources, Discussion of Impact b) (page 4-23)	They do meet the definition of ESHA and are considered sensitive.	Text on page 4-25 has been revised as follows: In addition, the creek and associated riparian habitat ~~may~~ meet the definition of an ESHA as defined by the CCC guidelines or the Half Moon Bay LCP and are ~~would be~~ considered sensitive. The Half Moon Bay LCP outlines permitted uses within specific ESHAs. Permitted uses within riparian corridors and riparian corridor buffers, such as the habitat associated with Pilarcitos Creek, include necessary water supply projects (City of Half Moon Bay ~~1993~~2020).
Section 4.4, Biological Resources, Discussion	See earlier comment concerning 15 ft. setback.	No vegetation removal or ground disturbance is planned within 15 ft of the top of the creek bank. Out of an abundance of caution, a minimum distance of 15 feet above the top of bank is included to minimize the potential for accidental encroachment into

of Impact b) (page 4-23)		sensitive habitat areas. A qualified biological monitor will be present during drilling operations to ensure drilling operations do not affect sensitive species or habitat. On page 4-23, Mitigation Measure BIO-1, has been revised as follows: All vegetation removal~~,~~ and construction-related ground disturbance~~, and other construction activities~~ shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas.~~to avoid low-lying mesic areas on the fringe of the creek.~~ A qualified biologist will monitor all drilling operations to ensure sensitive species and habitat are avoided.
Section 4.4, Biological Resources, Discussion of Impact c) (page 4-24)	Is this feasible? If not, additional discussion should be provided.	Yes, this is feasible. The contract documents will require that all trenches are backfilled or plated during non-working hours.
Section 4.7, Geology and Soils, Discussion of Impact a-ii) (page 4-33)	Cite compliance with the Geotech Study prepared for the project also.	The text on page 4-35 has been revised as follows: The P~~p~~roject would be designed, engineered, and constructed in conformance with standard engineering practices~~,~~ ~~and California Building Code requirements,~~ and geotechnical recommendations listed in the Project Geotechnical Investigation Report.
Section 4.7, Geology and Soils, Discussion of Impact a-iii) (page 4-33)	Cite Geotech Study	Text on page 4-35 has been revised as follows: In addition, the P~~p~~roject would follow all ~~is subject to all California Building Code requirements for seismic conditions and would be designed to conform to all building requirements~~ geotechnical recommendations listed in the Project Geotechnical Investigation Report.
Section 4.7, Geology and Soils, Discussion of Impacts c) and d) (page 4-33)	Cite Geotech Study	Text on page 4-35 has been revised as follows: The proposed Project is subject to all Federal, State, and local regulations and standards for seismic conditions ~~including the Uniform Building Code, California Edition~~ and would be designed to conform to all building requirements and geotechnical recommendations listed in the Project Geotechnical Investigation Report.
Section 4.8, Greenhouse Gas Emissions,	Does the project comply with the checklist standards? If so, document compliance.	Text on Section 4.8, page 4-37 has been revised as follows: The EECAP provides a Development Checklist to ensure new development projects are compliant with the standards outlined (San Mateo County 2013). The

Environmental Setting discussion (page 4-35)		Development Checklist does not apply to this Project because no new development is proposed.
Section 4.8, Greenhouse Gas Emissions, Discussion of Impact a) (page 4-36)	See earlier comment in Air Quality impact analysis. Identify types of heavy equipment that will be used and number of hours of use.	Text on Section 4.8, pages 4-37 to 4-38 has been revised as follows: GHG emissions from the Pproject would be produced from construction-related equipment emissions and operation of the pipeline components. During construction, GHG emissions would be generated through the operation of construction equipment (e.g., excavator, drill rig, front loader, mud mixing plant, and separation plant) and from workers and vendor vehicles, each of which typically use fossil-based fuel to operate. The combination of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. The BAAQMD does not have adopted thresholds of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emission that would occur during construction in relation to meeting Assembly Bill 32 GHG reduction goals. Because Project construction activities would be minor and short term (up to two months), GHG emissions were not quantified and would not interfere with meeting GHG reduction goals and would be well below the BAAQMD operational emissions threshold of 1,100 metric tons CO_2e per year for 2020, or below 660 metric tons CO_2e per year based on the GHG reduction goals of Senate Bill 32 (BAAQMD does not have a recommended post-2020 GHG threshold.). The operation and maintenance of the Project would remain consistent with existing conditions. GHG emissions associated with operation of the project would consist of GHG emissions from electricity consumption to move water through the system. Based on the nature of the Pproject and short duration of construction, GHG emissions resulting from construction activities would be both minor and temporary. Operational GHG emissions would be the same as existing conditions. While the Pproject would have an incremental contribution to GHG emissions within the context of the City and region, the individual impact is considered less than significant.
Section 4.9, Hazards and Hazardous Materials, Discussion of Impact f) (page 4-39)	Oak Avenue is a dead end street with residences on the southern frontage. There are no feasible detours available to maintain access to the residences.	The final construction drawings for the Project will require the contractor to maintain a minimum 20-foot wide travel lane on Pilarcitos Avenue and Oak Avenue at all times during construction to provide access for residents and emergency vehicles.

Section 4.10 Hydrology and Water Quality, Environmental Setting discussion (page 4-41)	2020 rainy season?	The text on page 4-43 has been revised as follows: Hydrology in the P~~p~~roject A~~a~~rea is provided by precipitation and overland runoff from adjacent areas. Precipitation for Half Moon Bay was below normal during the 2019/2020 rainy season, defined as October 1 to March 31. During the 2019/2020 rainy season, precipitation was below normal in October, November, and February, with December, January, and March, above normal levels of precipitation (NRCS 2021).
Section 4.11, Land Use and Planning, Environmental Setting discussion (page 4-43)	See earlier comments. Cite the 2020 LCP.	The text on page 4-45 has been revised as follows: The City's General Plan/LCP, adopted in ~~1993~~ 2020 with various subsequent chapter amendments, provides policies and implementation strategies for management of the resources and land uses in the City, and the City Codes provide restrictions and requirements to protect resources and comply with local, state, and federal laws.
Section 4.11, Land Use and Planning, Regulatory Setting discussion (page 4-44)	See earlier comments concerning the proposed 15 ft. setback.	No vegetation removal or ground disturbance is planned within 15 ft of the top of the creek bank. Out of an abundance of caution, a minimum distance of 15 feet above the top of bank is included to minimize the potential for accidental encroachment into sensitive habitat areas. A qualified biological monitor will be present during drilling operations to ensure drilling operations do not affect sensitive species or habitat. On page 4-23, Mitigation Measure BIO-1, has been revised as follows: All vegetation removal~~,~~ and construction-related ground disturbance~~, and other construction activities~~ shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas.~~to avoid low-lying mesic areas on the fringe of the creek.~~ A qualified biologist will monitor all drilling operations to ensure sensitive species and habitat are avoided.
Section 4.11, Land Use and Planning, Discussion of Impact a) (page 4-45)	construction of a replacement	Text on page 4-48 has been revised as follows: The project involves construction of a replacement ~~an~~ underground water pipeline and utility infrastructure primarily along existing right-of-way in an urban area.
Section 4.13, Noise, Mitigation Measure NOISE-1 (page 4-49)	This is required by ordinance, so it isn't really a mitigation measure.	On page 4-53 Mitigation Measure NOISE-1 has been revised as follows: • ~~Construction hours shall be limited to 7 a.m. to 6 p.m. Monday through Friday; 8 a.m. t 6 p.m. Saturdays; and 10 a.m. to 6 p.m. Sundays and holidays unless otherwise approved in writing by the City Director of Public Works/City Engineer.~~

Section 4.13, Noise, Mitigation Measure NOISE-1 (page 4-49)	Contact information for the City and CCWD will also be required.	On page 4-53 Mitigation Measure NOISE-1 has been revised as follows: • Notify businesses, residences, and noise-sensitive land uses adjacent to construction sites of the construction schedule in writing. Designate the District's construction manager as responsible for responding to any local complaints about construction noise. The construction manager shall determine the cause of the noise complaints (for example starting too early, or a bad muffler) and institute reasonable measures to correct the problem. Conspicuously post ~~a~~ telephone numbers for the construction manager, the City, and the District at the construction site.
Section 4.13, Noise, Mitigation Measure NOISE-1 (page 4-49)	Are barriers feasible? If so, identify the noise reduction that will be achieved with implementation.	Given the City's noise ordinance does not have a dBA limit and because construction noise was not modeled, sound barriers are not appropriate for this situation. Mitigation Measure NOISE-1 on page 4-53 has been revised as follows: • Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures: o Use heavy-duty mufflers for stationary equipment ~~and barriers around particularly noisy areas of the site or around the entire site~~; ~~o Use shields, impervious fences, or other physical sound barriers to inhibit transmission of noise to sensitive receptors;~~ o Locate stationary equipment to minimize noise impacts on the community; and o Minimize backing movements of equipment.
Section 4.13, Noise, Mitigation Measure NOISE-1 (page 4-50)	Define "quiet construction equipment." Provide dB reduction that will result.	Mitigation Measure NOISE-1 has been revised as follows: ~~• Use quiet construction equipment whenever possible.~~
Section 4.15, Public Services, Discussion of	See earlier comments concerning the proposed use of detours to maintain access.	The final construction drawings for the Project will require the contractor to maintain a minimum 20-foot wide travel lane on Pilarcitos Avenue and Oak Avenue at all times during construction to provide access for residents and emergency vehicles.

Impact a.i-ii) (page 4-53)	Fire District standards typically require maintaining a minimum vehicle travel path width of 20 feet and adequate room to accommodate turning movements of fire trucks.	
Section 4.17, Transportation, Discussion of Impact a) (page 4-55)	See earlier comments concerning feasibility of providing detours when the only access is a dead end street.	The final construction drawings for the Project will require the contractor to maintain a minimum 20-foot wide travel lane on Pilarcitos Avenue and Oak Avenue at all times during construction to provide access for residents and emergency vehicles.
Section 4. 17, Transportation, Discussion of Impact d) (page 4-56)	See comments concerning detours.	The final construction drawings for the Project will require the contractor to maintain a minimum 20-foot wide travel lane on Pilarcitos Avenue and Oak Avenue at all times during construction to provide access for residents and emergency vehicles.
Section 5.1, Checklist Information Sources, (page 5-1)	2020	Text on page 5-1 has been revised as follows: 3. City of Half Moon Bay General Plan/Local Coastal Plan, ~~1993~~2020
Section 5.2, References, (page 5-3)	2020	Text on page 5-3 has been revised as follows: City of Half Moon Bay ~~993~~2020 [City] City of Half Moon Bay.~~1993~~2020. City of Half Moon Bay Local Coastal Land Use Plan. Half Moon Bay, California. Online at: https://www.half-moon-bay.ca.us/154/Local-Coastal-Program-Land-Use-Plan~~http://www.half-moon-by.ca.us/~~; most recently accessed: ~~July 2020~~October 2021.

Comment L2-2: The document includes numerous references to the 1993 Local Coastal Plan (LCP). This version has been superceded by the updated LCP, adopted by the City in 2020 and certified by the Coastal Commission in 2021. Fixing this will be primarily an editing cleanup. However, there are substantial differences in the updated LCP including definitions and policies concerning riparian areas and visual resource areas that will require some additional work. I don't think the changes will affect the impact conclusions.

> **Response to Comment L2-2:** Refer to Table 1 above and Final IS/MND pages 4-44 through 4-46 regarding revisions of the 1993 LCP to the 2020 LCP.

Comment L2-3: The document includes numerous references to providing "detours" to maintain access to neighboring residences. Oak Avenue is a dead end street. I don't believe there are feasible detours. I contacted Coastside Fire. They stated that they generally require a minimum width of 20 feet for fire truck access.

> **Response to Comment L2-3:** The final construction drawings for the Project will require the contractor to maintain adequate width for emergency vehicles access on Oak Avenue .

Comment L2-4: Some impact statements and mitigation measures are not supported by evidence, and some mitigation measures do not appear to be feasible. Both are requirements of CEQA. This will require more substantial work. In some cases (air emissions and greenhouse gas emissions), the evidence is readily available by citing specific published exemptions provided by BAAQMD that would apply to this project.

> **Response to Comment L2-4:** Refer to Table 1 above regarding revisions of the air quality and greenhouse gas emissions impact analyses.

APPENDIX D – MITIGATION MONITORING AND REPORTING PROGRAM

Water Line Replacement under Pilarcitos Creek at Strawflower Village
Mitigation Monitoring and Reporting Program

October 2021

The California Environmental Quality Act (CEQA) and the CEQA Guidelines require Lead Agencies to adopt a program for monitoring the mitigation measures required to avoid the significant environmental impacts of a project. This Mitigation Monitoring and Reporting Program (MMRP) ensures that mitigation measures imposed by the Coastside County Water District (District) are completed at the appropriate time in the development process.

The mitigation measures identified in the Initial Study/Mitigated Negative Declaration for the Water Line Replacement under Pilarcitos Creek at Strawflower Village are listed in this MMRP along with the party responsible for monitoring implementation of the mitigation measure, the milestones for implementation and monitoring, and a signoff that the mitigation measure has been implemented.

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
BIO-1: All vegetation removal and construction-related ground disturbance shall occur at minimum 15 ft above the top of the creek bank and within developed or park areas. A qualified biologist will monitor all drilling operations to ensure impacts to sensitive species and habitat are avoided.	During construction	Coastside County Water District	
BIO-2: Proposed Project activities shall occur between September 1 and February 14 in order to avoid potential impacts during the nesting season. If Project activities are conducted during the nesting season (February 15 – August 31), a pre-construction nesting bird survey shall be performed no more than 14 days prior to initial ground disturbance to avoid impacting active nests. If the survey identifies any active nests, an exclusion buffer shall be established for protection of the nest. Buffer distances shall vary based on species and conditions at the site, but typically range from 25 up to 500 ft. The buffer shall be maintained until all young have fledged or until the nest fails, or otherwise becomes inactive. Buffers may be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.	Prior to and during construction	Coastside County Water District	
BIO-3: The following measures shall be implemented to avoid impacts to California red-legged frog, San Francisco garter snake, western pond turtle, and steelhead: • The Project has been designed and shall be implemented in such a way to avoid and minimize the risk of spills and frac-outs, as evaluated in the Preliminary Design Report (Appendix F) for this Project. Although the risk of frac-outs was identified as low, the HDD contractor shall prepare a Frac-out and Surface Spill Prevention Plan, based on information contained in the HDD Specifications section 02413, prepared by EKI and dated April 2021. The Frac-out Plan shall be prepared prior to construction. The plan shall address the potential risks and modes of frac-outs	Prior to and during construction	Coastside County Water District	

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
and frac-out prevention and detection. The plan shall include a project description, including site description, existing conditions, relevant permit requirements, and HDD design and operations, and shall at a minimum include the following information. o Calculations of maximum allowable and minimum required drilling fluid pressures, and the critical downhole pressure that would cause hydrofracture. o Measures describing training of personnel regarding frac-out monitoring procedures, equipment, materials, and procedures in place for the prevention, containment, cleanup, and disposal of drilling fluids. o Pre-construction measures such as lining the entry pit with an impervious flexible membrane, creating an earth berm, or erecting silt fence around the drilling fluid mixing and pumping areas, and erecting silt fences between the drilling staffing areas and sensitive areas. o Identifying the personnel on site during the entire HDD installation process with responsibility for detecting whether surface returns have occurred and how they will conduct the monitoring. o Monitoring of drilling pressures to ensure that they are maintained at a minimum level necessary to maintain fluid circulation and do not exceed those pressures that may penetrate the ground. o Monitoring of fluid returns at the exit and entry pit to determine if fluid circulation has been lost. o The Contractor shall measure and record the drilling fluid viscosity and density at least two times per shift or once every 150 feet of advancement, whichever is more			

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
frequent, with at least two hours between readings, using a calibrated Marsh funnel or rheometer/rotating viscometer, and a mud balance. These records shall be maintained and provided daily to the Engineer. • Protocols to be followed if there is a loss of circulation or other indication of frac-out are described below. o Immediately respond to detection of a frac-out by stopping drilling operations and pulling back the drill head to relieve pressure. o Implement procedures to contain terrestrial returns (e.g., by an earth berm, installation of materials to contain the fluid, or other method). o Implement procedures to contain returns into a waterway or sensitive area (e.g., installation of sandbags or a standpipe or barrel tall enough to exceed the water level and sealed at the base). o Implement procedures for clean-up and disposal of frac-out materials. o Include an on-site materials list to manage and control drilling fluid surface releases, such as heavy weight plastic gravel filled and sealed bags, splash boards, 5-gallon hard plastic pails, wide heavy-duty push brooms, flat blade and round-nose shovels, silt fence and t-posts or straw bales, chicken wire or connecting material to tie off the perimeter of a dewatering structure, absorbent pads to use with plastic sheeting for placement beneath motorized equipment, straw wattles, portable pumps, hoses, vacuum trailers or trucks, silt fence or screens. o If a frac-out event occurs, the qualified biological monitor present during drilling operations shall be			

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
consulted to minimize disturbance to sensitive species and habitat during any immediate response and containment actions. Following containment, a qualified biologist shall document any adverse impact to sensitive habitat or species to help inform whether remedial actions may be warranted. If remedial actions are warranted, in consultation with the City and any relevant regulatory agencies, a mitigation plan will be developed with the proposed remedial actions and measureable performance standards to ensure adversely affected habitat is restored to pre-construction conditions or better. The mitigation plan will be submitted to the City of Half Moon Bay and any relevant regulatory agencies within 30 days of the event for review and approval. The City and relevant regulatory agencies shall inspect and approve any remedial actions taken by the Lead Agency to respond to the frac-out event.			
BIO-4: To avoid impacts to the San Francisco dusky-footed woodrat, a pre-construction survey shall be conducted to search for stick nests in suitable habitats adjacent to the work area. Nest structures shall be avoided by Project work or access routes by a minimum of 5 ft. If avoidance is not feasible, the nest structure shall be dismantled by a qualified biologist. Nest material would be moved to suitable adjacent areas that shall not be disturbed. If young are encountered during the dismantling process, the material would be placed back on the nest and remain undisturbed for a minimum of two weeks to give the young enough time to mature and leave on their own accord. After the young have left the nest, the nest dismantling process would begin again.	Prior to and during construction	Coastside County Water District	
BIO-5: The following general avoidance measures shall be implemented in the vicinity of stream and riparian habitat:	Prior to and during construction	Coastside County Water District	

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
• Plastic monofilament netting (erosion control matting or wrapping around wattles), or similar material in any form shall not be used on the Project in order to avoid entangling, strangling, or trapping California red-legged frog, San Francisco garter snake, or western pond turtle. • Prior to the start of groundbreaking activities, all construction personnel shall receive training on special-status species and their habitats by a qualified biologist. The importance of these species and their habitat shall be described to all employees as well as the minimization and avoidance measures that are to be implemented as part of the Project. A list of trained personnel shall be maintained by the contractor and be made available for review by the USFWS and the CDFW upon request. • No trash shall be deposited on the site during construction activities. All trash shall be placed in trash receptacles with secure lids stored in vehicles and removed nightly from the Proposed Project Area. • Any fueling and maintenance of equipment shall be conducted off-site and at least 50 ft from any designated ESHA, which includes Pilarcitos Creek and the associated riparian vegetation adjacent to the creek. • When working within 50 ft of sensitive areas (e.g., adjacent to riparian habitat), wildlife exclusion fencing shall be installed and maintained around the perimeter of work areas. Exclusion fencing shall enclose any staged materials, equipment staging areas, work areas or access routes. Fencing shall be placed in areas which would prevent San Francisco garter snake and California red-legged frog from entering equipment or materials overnight. Once work in that area has been completed, exclusion fencing shall be removed as soon as possible. Exclusion fencing shall additionally			

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
be of a size and material that will not cause entrapment of California red-legged frog. • Construction activities shall not start until 30 minutes after sunrise and shall cease 30 minutes before sunset. • No holes or trenches shall be left open overnight. The contract documents will require that all trenches are backfilled or plated during non-working hours.			
CULT-1: The District or its contractor shall conduct pre-work training so that in the event that soil disturbance uncovers buried archaeological deposits, workers are aware of what a buried deposit might look like and what they need to do. In keeping with the CEQA guidelines, if previously unidentified cultural resources or archaeological remains are uncovered, work at the place of discovery shall be halted immediately until a qualified archaeologist can evaluate the finds (§15064.5 [f]). Prehistoric archaeological site indicators include but are not limited to obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps). The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5 and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location shall be halted in the vicinity of the find, and the	Prior to construction and in the event that cultural resources or archaeological remains are uncovered.	Coastside County Water District	

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**
county coroner and a qualified archaeologist must be notified immediately so that an evaluation can be performed. If the coroner determines the remains are Native American and prehistoric, the coroner shall contact the Native American Heritage Commission. The Native American Heritage Commission shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.			
HAZ-1: During construction activities, the construction contractor shall implement the following BMPs to prevent wildlife hazards: • Staging areas, welding areas, or areas slated for development using spark producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. The contractor shall keep these areas clear of combustible materials in order to maintain a firebreak. • No smoking, open flames, or welding shall be allowed in refueling or service areas. • Service trucks shall be provided with fire extinguishers. A minimum of two fire extinguishers shall be kept on site during proposed project construction. • Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order	During construction	Coastside County Water District	
NOISE-1: The District shall incorporate the following practices, in addition to those listed in the project description, into the construction documents to be implemented by the project contractor: • Notify businesses, residences, and noise-sensitive land uses adjacent to construction sites of the construction schedule in writing. Designate the District's construction manager as responsible for responding to any local complaints about construction noise. The construction manager shall determine the	Prior to and during construction	Coastside County Water District	

MITIGATION MONITORING AND REPORTING PROGRAM WATER LINE REPLACEMNT UNDER PILARCITOS CREEK			
Mitigation Measure	**Implementation Schedule**	**Monitoring Agency**	**Sign-Off**

cause of the noise complaints (for example starting too early, or a bad muffler) and institute reasonable measures to correct the problem. Conspicuously post telephone numbers for the construction manager, the City, and the District at the construction site.
• Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures:
  o Use heavy-duty mufflers for stationary equipment;
  o Locate stationary equipment to minimize noise impacts on the community; and
  o Minimize backing movements of equipment.
• Impact equipment (e.g., jack hammers and pavement breakers) shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. Compressed air exhaust silencers shall be used on other equipment. Other quieter procedures, such as drilling rather than using impact equipment, shall be used whenever feasible.
• Prohibit unnecessary idling of internal combustion engines.			

TRAFFIC-1: • Local emergency services shall be notified prior to construction to inform them that traffic delays may occur, and also of the proposed construction schedule. • The District shall require the contractor to provide for passage of emergency vehicles through the proposed Project Area at all times. • The District shall require the contractor to maintain access to all residences during project construction.	Prior to and during construction	Coastside County Water District	

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Report Date: **November 5, 2021**

Subject: **Consider and Reaffirm Resolution 2021-06 "Making Findings Pursuant to Assembly Bill 361 That the Proclaimed State of Emergency Continues to Impact the Ability to Meet Safely in Person."**

Recommendation:

Reaffirm, by motion, Resolution 2021-06, making findings pursuant to Assembly Bill 361 that the proclaimed State of Emergency continues to impact the ability to meet safely in person.

Background:

On March 4, 2020, Governor Newsom declared a State of Emergency to exist in California as a result of the thread of COVID 19, and on March 17, 2020, the Governor issued Executive Order N-29-20 suspending certain provisions of the Ralph M. Brown Act relating to teleconferencing to allow legislative bodies to conduct meetings remotely to help protect the spread of COVID-19 and to protect the health and safety to the public. On June 11, 2021, the Governor issued Executive Order N-08-21 which specified that Executive Order N-29-20 remained in effect through September 30, 2021.

On September 16, 2021, the Governor signed Assembly Bill 361 (AB361) into law to allow legislative bodies to continue to meet remotely during a proclaimed State of Emergency after September 30, 2021.

On October 8, 2021, the Board of the Directors of the Coastside County Water District adopted Resolution 2021-06. Per AB361, the Board will need to consider and reaffirm the findings of Resolution 2021-06 monthly.

By reaffirming Resolution 2021-06, the Board has considered the circumstances of the proclaimed State of Emergency and finds that the State of Emergency continues to directly impact the ability of the members to meet safely in person, and state or local officials continue to impose or recommend measures to promote social distancing.

STAFF REPORT

To: **Board of Directors**

From: **Cathleen Brennan, Water Resources Analyst**

Agenda: **November 9, 2021**

Report: November 4, 2021

Subject: Water Shortage Advisory and Public Outreach Update

Attachments: A. Water Savings Tracker
B. Outreach Summary

Background

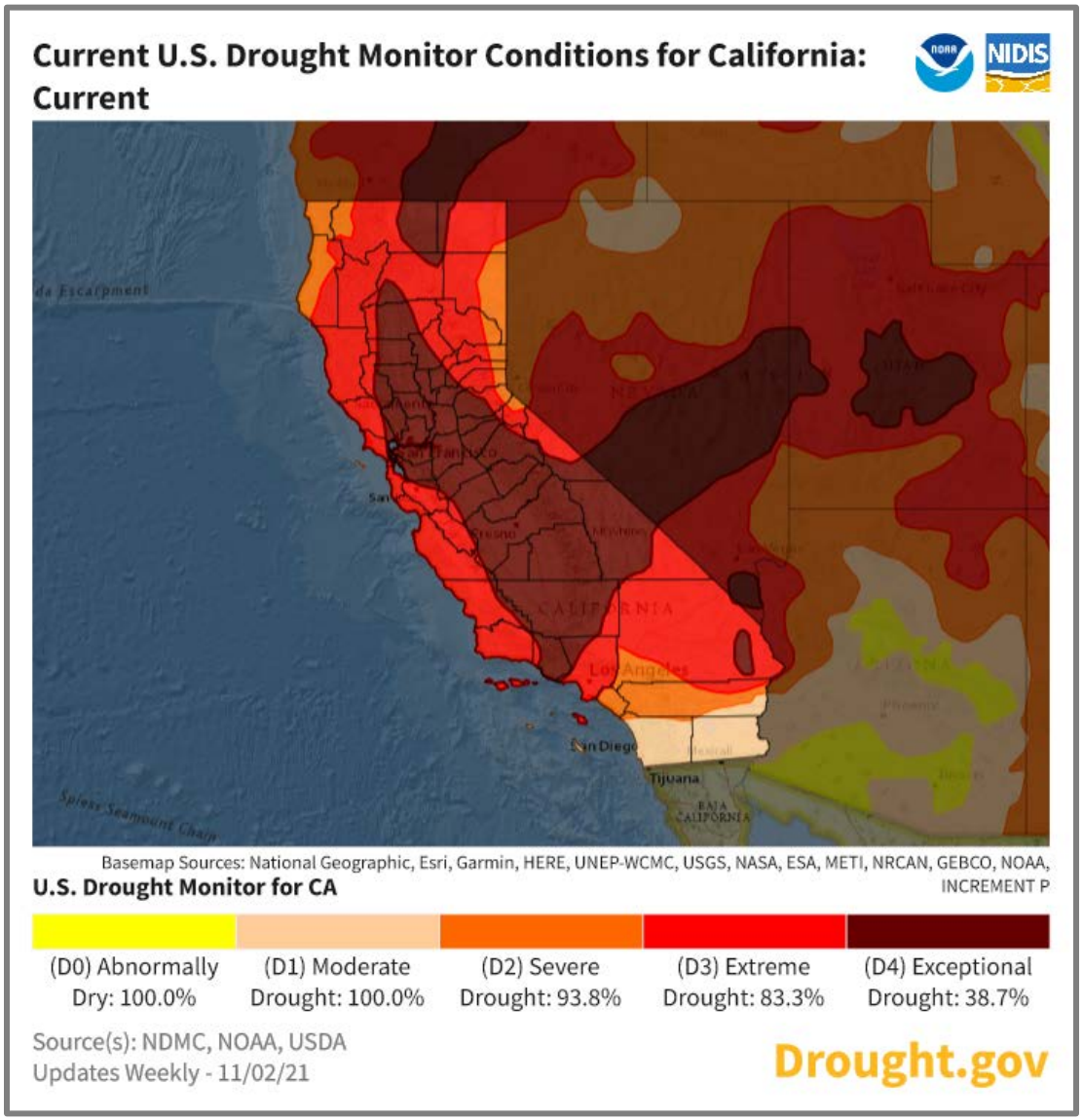
The SFPUC has been asking wholesale customers to implement voluntary reductions in water purchases by 15 percent as of July 12, 2021. SFPUC's request for voluntary reductions in water purchases aligns with Governor Newsom's July 8th Executive (N-10-21) Order that calls on all Californians to voluntarily reduce their water use by 15 percent from calendar year 2020. The table below provides a timeline of milestones.

Milestones	
4/21/2021	Governor Newsom issued proclamation of state of emergency for the counties impacted the most severely by drought conditions, after two years of below normal precipitation. San Mateo County was not included on this initial proclamation.
4/15/2021	SFPUC requests voluntary 10 percent reduction in irrigation (outdoor) water use starting July 1, 2021. Goal is not to exceed 2019 summer water demand.
5/10/2021	Governor Newsom expanded on the 4/21/2021 proclamation and included more counties.
5/11/2021	The BOD approved Coastside CWD implementing Stage 1 of the District's WSCP – Water Shortage Advisory
7/8/2021	Governor Newsom's Executive Order N-10-21 includes San Mateo County and Santa Clara County in the declaration of a drought emergency. Alameda County was already included in the drought emergency. San Francisco County is not included. "I call on all Californians to voluntarily reduce their *(total)* water use by 15 percent from their (*CY*) 2020 levels."
7/12/2021	SFPUC revises their request to align with Governor Newsom's request that total water use be voluntarily reduced by 15 percent from 2020 water usage levels.
8/19/2021	Curtailment order for the Delta Watershed (including the San Joaquin River watersheds) authorized by the State Water Resources Control Board and approved by the Office of Administrative Law on August 19, 2021. https://www.waterboards.ca.gov/drought/delta/
9/26/2021	Warning from BAWSCA of elevated water rationing status from SFPUC. Mandatory rationing request by SFPUC of at least 10 percent as early as late October due to curtailment orders on the SF Bay-Delta tributaries.

11/23/2021	Scheduled SFPUC meeting to consider declaring a water shortage emergency with voluntary measures to meet a 10 percent reduction for wholesale customers, which triggers Tier 1 and Tier 2 allocation agreements. SFPUC retail customers will voluntarily reduce 5 percent. **January is the target for implementation of Tier 2 allocations.**

Report

San Mateo County is experiencing extreme drought conditions and watersheds in Alameda County and Tuolumne County are experiencing extreme to exceptional drought conditions. The watersheds that the District relies on for water supply have experienced two consecutive years of drought and there is chance of a third year of drought conditions.



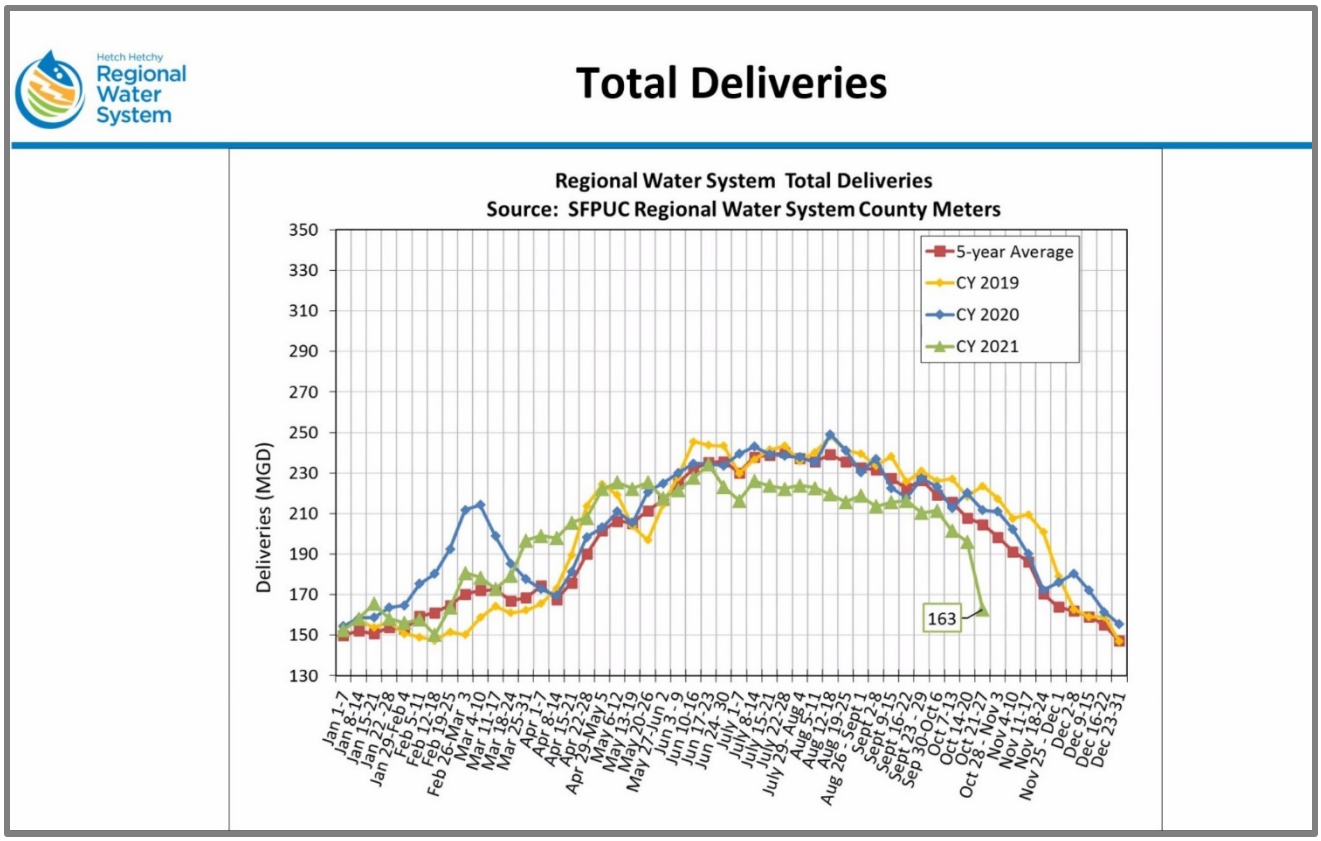
Production
With recent precipitation, the District was able to resume use of local surface water and groundwater in the last week of October. When comparing the month of October 2021 **imported water** production data to the month of October 2020 **imported water** production data, it shows that the District decreased its purchases by 18 percent**. The goal is a 15 percent reduction to meet SFPUC's request.**

Consumption
When comparing sales data from the month of October 2021 to the month of October 2020, it shows that District customers are using about 10 percent less water. **Our goal is for customers to use 15 percent less water compared to 2020 to meet the Governor's conservation request.**

Outreach
Attached to the report is a summary of the outreach staff has completed by month, since the District declared a Water Shortage Advisory. An advertisement was placed in the Half Moon Bay Review on October 27th and the same advertisement was placed in the October Coastside Magazine. The advertisement is attached to the staff report. In addition, the Half Moon Bay Review published water saving tips for its readers.

SFPUC Update
Staff received an update on November 4th from San Francisco Water on the water shortage from Steve Ritchie the Assistant General Manager. The recent storms in October have improved SFPUC's total storage and triggered lifting the curtailments on the Tuolumne River watershed. With the curtailments lifted, SFPUC may access the water bank making more water supplies available to the Regional Water System. It is unknown when or if the state will impose curtailments again.

The good news is that with the October precipitation the total demand on the RWS has declined. This is exactly what the SFPUC would like to see continue through the winter months to avoid going into mandatory measures with fines for exceeding allocations. The graph below shows (green line) that the trend of water deliveries from SFPUC declining since July 2021, with a significant reduction in late October 2021.



San Francisco Water is planning on bringing to the SFPUC a declaration of a Water Shortage Emergency on November 23rd. It was originally planned for November 9th but was delayed. San Francisco Water staff will be asking the Commission to declare an emergency but still maintain voluntary rationing for both retail and wholesale customers. A five percent reduction for retail customers and a 10 percent reduction for wholesale customers.

Tracking Water Savings

Total Consumption (Water Sales)

Month	Base Year CY2020 MG	Current Year FY2021 MG	Savings MG	Savings %
January				
February				
March				
April				
May				
June				
July	68.43	61.92	6.51	10%
August	62.77	60.15	2.62	4%
September	58.83	60.77	-1.94	-3%
October	61.93	55.55	6.38	10%
November				
December				
Sum	251.96	238.39	13.58	5%
Goal to Date:		**214.2**		**15%**

On July 8th, through Executive Order N-10-21, Governor Gavin Newsom asked all Californians to voluntarily reduce their water use by 15 percent from their 2020 levels.

SAVE OUR WATER

SFPUC Purchased Water by Coastside CWD

Month	Base Year FY2020 MG	Current Year FY2021 MG	Savings MG	Savings %
July	42.85	65.93	-23.08	-54%
August	46.56	61.90	-15.34	-33%
September	50.17	59.74	-9.57	-19%
October	58.61	48.01	10.6	18%
November				
December				
January				
February				
March				
April				
May				
June				
Sum	198.19	235.58	-37.39	-19%
Goal to Date:		**168.5**		**15%**

Wholesale customers have been asked to implement approaches to control summer time peak use. This water reduction strategy went into effect on April 15, 2021 by SFPUC. This was amended to request a voluntary 15 percent reduction in water purchases on July 12th 2021.

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Savings are shown as a positive number

Stage 1 - Water Shortage Advisory

Completed Outreach		
Month	Message	Task
May 2021	10 percent Reduction Outdoors	Implemented WSCP Stage 1- Water Shortage Advisory E-Newsletter: Water Shortage Advisory (WSA) **10% Reduction** of Outdoor Water Use Interview with KQED Radio Interview with HMB Review Fact Sheet 10 percent reduction in outdoor WSA Website updated to show Water Shortage Advisory Status under Drought
June 2021	10 Percent Reduction Outdoors	Coastside Radio Interview
July 2021	15 Percent Reduction – Total – with emphasis on reducing irrigation	Email to 800 high users identified by WaterSmart Letter to 120 high water users that **don't** have email Updated Fact Sheet to **15 percent reduction** WSA Posted new fact sheet to website WSA message on home page of website Nextdoor Post – WaterSmart & WSA Twitter Post – WaterSmart & WSA Postcard - WaterSmart and 15 percent reduction Interview with Coastside News Group

		Billing Statement Message Banner (from last drought) placed on Building and Fence -no overspray from irrigation -use shutoff nozzles Delivered table tent cards to restaurants with the messaging that water is served on request.
August 2021	15 Percent Reduction - Total – with emphasis on reducing irrigation.	Meeting with County of San Mateo Drought Task Force – Department of Emergency Management 8/3/2021 Large banner installed 8/24/2021on brick wall facing Main Street E-Newsletter: Water Waste Prohibitions 8/25/2021 District reached out by either email or mail to 873 single family residential customers regarding irrigation or high water use.
September 2021	15 Percent Reduction - Total – with emphasis on reducing irrigation	Presentation to the Half Moon Bay Rotary Club 9/23/2021 District reached out by either email or mail to 1,436 single family residential customers regarding irrigation or high water use.
October 2021	15 Percent Reduction - Total – with emphasis on reducing irrigation.	GM of District talked with AGM of San Francisco Water to discuss water supply shortage and the District's lack of local supplies during extreme drought. 10/12/2021

	Turn off you irrigation systems.	Coastside Magazine (October 13, 2021) advertisement for Stage 1 Water Shortage Advisory Half Moon Bay Review (October 27, 2021) advertisement for Stage 1 Water Shortage Advisory District reached out by either email or mail to 1200 single family residential customers regarding irrigation or high water use.

Save Our WATER

saveourwater.com

We are in an extreme drought
Use water wisely

- The days are getting shorter and your landscape doesn't need as much water. **It's time to turn off your automatic irrigation systems**. Water by hand, as needed.
- Sweep your sidewalks, patios, and driveways.
- Wash your car at a commercial car wash that recycles water.
- Take shorter showers and remember to turn off the water when you brush your teeth.
- Only wash full loads of laundry and dishes.

COASTSIDE COUNTY WATER DISTRICT

Remember to sign-up for
WaterSmart
to track your daily water usage and receive high usage notifications.
Contact
watersmart@coastsidewater.org

coastsidewater.org

THE INSIDE STORY

Half Moon Bay Review

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[PHOTO OF THE WEEK]

Adam Pardee / Review

Walking in the weather

A woman walks her dog along Miramar Beach over a wild weekend on the coast.

[HISTORIC HEADLINES]

1872

Debenedetti arrives in Half Moon Bay

Joseph Debenedetti arrived in Half Moon Bay carrying a pack of merchandise on his back. He turned that into a successful general store at the corner of Main and Mill streets and would open the town's first post office. He also served as a San Mateo County supervisor.

1926

Fire district argues for alarm system

Local firefighters asked for an electronic system that would sound an alarm in the event of fire on the coast. The Half Moon Bay Review joined the crusade: "Now that the Half Moon Bay Fire District is possessed of a fire truck, there should be a system installed to give the alarm without having to lose valuable time in going to the bell tower to do so."

1942

Curfew goes into effect

San Mateo County Supervisors passed a rural curfew during wartime. Supervisor Alvin Hatch of Half Moon Bay suggested the time be set for 9 p.m. for all juveniles. In the end, elected officials left the details up to the district attorney.

[TALK OF THE TOWN]

Best cup may be at home

Locals are debating the best coffee on the coast. One Coastsider suggested McDonald's hot coffee for those who err toward a traditional choice due to its consistency and price, but many on the coast prefer other local establishments.

On Main Street, Cafe Society has gained popularity due to its quality brew and location. Locals are also drawn to the Peruvian coffee beans they have for sale. Dawn Patrol Coffee and The Press are popular among El Granada residents, but the most popular on the Midcoast seems to be the El Granada Hardware Store.

One local in Moss Beach shared that he thinks the best coffee on the coast can be found at his house. He shared his recipe of 35 grams of Peet's Coffee Major Dickason's Blend beans that he blends four stops up from the espresso setting on his grinder. This he brews with boiling water for four minutes in a Clever Coffee Dripper. Finally, he combines with 100 milliliters of Straus Family Creamery brand heavy whipping cream. This Coastsider might give the local coffee joints a run for their money.

Time to turn off sprinklers

With the rainy season upon us, a local is urging neighbors to turn off their irrigation to save water. She pressed that if we get normal rainfall we probably don't need to turn on irrigation until May or June.

A Coastsider said it's unethical at this point to even have a lawn knowing what we do about the future of our water troubles. She called for her neighbors to do away with lawns altogether so we can collectively save water while we still can.

When there's a mouse in the house

A Half Moon Bay resident found a mouse in the pantry and trapped it using a live animal trap from Hassett Hardware Store. She let the mouse loose in the fields near her house and hoped it would live happily ever after "like in a Disney movie," but knew it was probably eaten by a bird. Possibly the recently rescued hawk.

A San Gregorio neighbor contributed that she is also a huge rodent fan but that electrocution traps are the most humane. She said that live traps just help a person relocate the animal, but it ends up far from its family and known food sources.

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Report Date: November 5, 2021

Subject: **1) Review Draft Water Shortage Contingency Stage Rate Study and Proposed Amendment to the District's Rate and Fee Schedule to Add Water Shortage Contingency Stage Rates Consistent with the 2020 Water Shortage Contingency Plan and SFPUC Pass-through Wholesale Water Shortage Rates or Surcharges; and**
2) Schedule a Public Hearing on Proposed Amendment to the District's Rate and Fee Schedule to Add Water Shortage Contingency Stage Rates and SFPUC Pass-through Wholesale Water Shortage Rates or Surcharges and Authorize Issuance of a Notice of Public Hearing

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Recommendation:
Review the draft Water Shortage Contingency Stage Rate Study dated October 29, 2021 (Exhibit A) prepared by Raftelis Financial Consultants, LLC. ("Raftelis") and the accompanying proposed amendment to the District's Rate and Fee Schedule to add water shortage contingency stage rates that are consistent with the District's 2020 Water Shortage Contingency Plan and to add SFPUC pass-through wholesale water shortage rates or surcharges.

Schedule a public hearing for Tuesday, January 11, 2022, at the regular Board of Directors Meeting starting at 7:00 PM on the proposed amendment to the Rate and Fee Schedule to add water shortage contingency stage rates and SFPUC pass-through wholesale water shortage rates or surcharges and authorize the issuance of a Notice of Public Hearing (Exhibit B.)

.

Background:

At the June 8, 2021 Board of Directors meeting, the Board approved the 2020 Water Shortage Contingency Plan. This plan provides for water shortage stage levels and recommended actions and procedures that the Board can implement during any water shortage, including drought, natural or other disasters, and catastrophic infrastructure failures.

During water shortages, the District will ask for reductions in water use from its customers, which will result in reduced water sales and increased costs to incorporate potential changes to the District's water supply sources. Expenditures at the District do

not decline in proportion to reduced sales because a large part of the District's expenditures are related to fixed capital costs, maintenance and operations.

On September 14, 2021 at the regularly scheduled Board of Directors Meeting, Sanjay Gaur and Nancy Phan from Raftelis led a discussion with the Board explaining the purpose of water shortage contingency stage rates and the possible options for adding such rates to the District's Rate and Fee Schedule. As explained by Mr. Gaur, given Proposition 218 requirements, water shortage contingency stage rates are designed to recover lost revenue due to the reduction in water, to incorporate the potential changes to the District's water supply sources and their corresponding costs; to align with specific water shortage contingency stages as outlined in the 2020 Water Shortage Contingency Plan; and to provide financial flexibility for the District when declaring water shortages.

Mr. Gaur emphasized that the purpose of water shortage contingency stage rates is strictly financial to enable the District to maintain financial stability at the various stages of water shortages as defined by the District's 2020 Water Shortage Contingency Plan. Water shortage contingency stage rates should not be construed to be penalties. The water shortage contingency stage rates consider the financial impacts of each of the following water shortage stages as defined by the District:

Water Shortage Contingency Stages – Shortage Levels:

Stage 1	**Up to 10%**	***Water Shortage Advisory***
Stage 2	**Up to 20%**	***Water Shortage Emergency Warning***
Stage 3	**Up to 30%**	***Water Shortage Emergency***
Stage 4	**Up to 40%**	***Water Shortage Severe Emergency***
Stage 5	**Up to 50%**	***Water Shortage Extreme Emergency***
Stage 6	**Up to 60%**	***Water Shortage Catastrophic (Extraordinary) Emergency***

Adding water shortage contingency stage rates to the District's Rate and Fee Schedule does not mean that the rates are automatically applied to customer bills if a water shortage contingency stage is declared by the Board. Based on Proposition 218 requirements, the resulting water shortage contingency stage rates are the maximum that the Board of Directors can implement. When officially declaring a water shortage stage based upon the 2020 Water Shortage Contingency Plan, the Board has the discretion to implement a lower or no water shortage contingency stage rate, use reserves to make up for lost revenue, defer capital projects, or a combination of strategies.

Additional detail regarding the proposed water shortage contingencies stage rates modeled by Raftelis follows below.

<u>Review Draft Water Shortage Contingency Stage Rate Study and Proposed Amendment to the District's Rate and Fee Schedule to Add Water Shortage Contingency Stage Rates</u>

In 2018, the District Staff engaged Raftelis Financial Consultants, LLC. ("Raftelis") to prepare a "Cost of Service and Rate Study" (dated May 15, 2018) in order to develop cost of service-based water rates which would meet the requirements of Proposition 218. This Study was used to set the District's rates for Fiscal Years 2018/19 and 2019/20 and to comply with the substantive requirements of Proposition 218 as interpreted by the courts, including the April 2015 Appellate Court decision in Capistrano Taxpayers Association, Inc. v. City of San Juan Capistrano.

The Cost of Service Analysis is the fundamental benchmark used to establish utility rates in the United States. The Cost of Service Analysis is used to allocate/recover the District's costs to users in proportion to their use of the system, recognizing the impact of each customer class on system facilities and operations.

In 2020, Raftelis conducted an updated study based upon the 2018 Cost of Service Analysis and Rate Study and prepared a Financial Planning Model to develop rates for Fiscal Years 2020/21 and 2021/22. The results of the Raftelis study are included in the "Water Financial Plan and Rate Update Report" dated August 3, 2020.

In Summer 2021, staff engaged Raftelis to develop options for water shortage contingency stage rates utilizing the August 3, 2020 "Water Financial Plan and Rate Update Report" and the 2020 Water Shortage Contingency Plan (approved June 8, 2021) as the basis for the rates.

The attached draft "Water Shortage Contingency Stage Rate Study" dated October 29, 2021 details many of the key points discussed with the Board at the September 14, 2021 Board meeting and provides the calculations for the proposed rates.

At the September meeting, the Board was presented with three different approaches for computing and allocating water shortage contingency stage rates: 1) Uniform Commodity Charge (or applying the same charge per unit of water to all quantity charges, regardless of customer class or tier); 2) Uniform Percentage Charge (or applying the same percentage increase to all quantity charges, regardless of customer class or tier); or 3) Monthly Fixed Meter Charge (based upon meter size, and not tied to usage.)

The advantages of each approach are shown below. The Board's preference was to consider using the uniform percentage approach given the advantages listed below including targeting use and conservation and promoting affordability.

Policy Objectives	Uniform Quantity Charge	Uniform Percentage	Monthly Fixed Meter Charge
Easy to understand and administer	★★	★★	★★★
Stability and guaranteed recovery of revenue	★★	★	★★★
Ability to change the bill	★★	★★★	★
Targeted use and conservation	★★	★★★	★
Promotes affordability	★★	★★★	★

Utilizing the modeling prepared as support for the August 3, 2020 "Water Financial Plan and Rate Update Report", Raftelis calculated the proposed water shortage contingency stage rates using the Uniform Percentage approach. The first table 1-3 below provides the incremental water shortage contingency stage rate per unit (hcf – or hundred cubic feet) at each water shortage contingency stage, and the second table 1-4 shows the new Baseline water stage (column B) that will become effective January 1, 2022 plus the proposed new water shortage contingency stage rates, if adopted, and that will be added to the Rate and Fee Schedule on January 12, 2022.

Table 1-3: Proposed Stage Rates ($/hcf)

Line	A Customer Class	B Stage 1	C Stage 2	D Stage 3	E Stage 4	F Stage 5	G Stage 6
1	Single Family Residential						
2	Tier 1	$2.24	$4.01	$5.70	$7.96	$12.09	$24.04
3	Tier 2	$3.27	$5.87	$8.34	$11.64	$17.68	$35.15
4	Tier 3	$3.95	$7.09	$10.09	$14.08	$21.38	$42.52
5	Multi-Family Residential	$2.98	$5.35	$7.60	$10.61	$16.11	$32.05
6	Non-Residential	$3.17	$5.70	$8.10	$11.31	$17.17	$34.16

Table 1-4 shows the combined quantity charges and stage rates. The Baseline quantity charges (Column B) are based on the District's CY 2022 water rates. The combined rates are equal to the Baseline quantity charges plus the proposed stage rates for each stage detailed in **Table 1-3**.

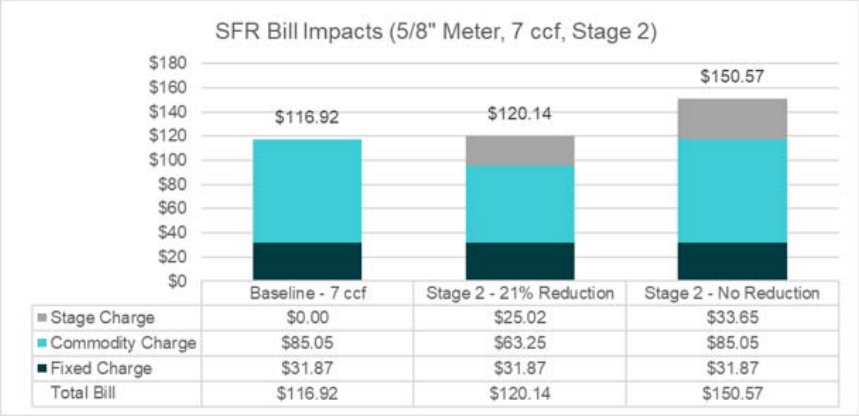
Table 1-4: Proposed Quantity Charges and Stage Rates ($/hcf)

Line	A Customer Class	B Baseline	C Stage 1	D Stage 2	E Stage 3	F Stage 4	G Stage 5	H Stage 6
1	Single Family Residential							
2	Tier 1	$10.14	$12.38	$14.15	$15.84	$18.10	$22.23	$34.18
3	Tier 2	$14.83	$18.10	$20.70	$23.17	$26.47	$32.51	$49.98
4	Tier 3	$17.94	$21.89	$25.03	$28.03	$32.02	$39.32	$60.46
5	Multi-Family Residential	$13.52	$16.50	$18.87	$21.12	$24.13	$29.63	$45.57
6	Non-Residential	$14.41	$17.58	$20.11	$22.51	$25.72	$31.58	$48.57

If approved, the above rates will be added to the District's Rate and Fee Schedule as of January 12, 2022 and could be available to implement by a Board action during declared water shortages.

Ms. Phan also presented bill impacts as shown in the next two figures using typical monthly use of 7 units by a residential customer. These figures demonstrate that when the District's customers achieve the recommended water usage reductions as defined in the Water Shortage Contingency Plan, the impact to customer bills will be minimal.

Figure 1-2: Single Family Residential Customer Impacts (Stage 2)



	Baseline - 7 ccf	Stage 2 - 21% Reduction	Stage 2 - No Reduction
Stage Charge	$0.00	$25.02	$33.65
Commodity Charge	$85.05	$63.25	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$120.14	$150.57

Figure 1-3: Single Family Residential Customer Impacts (Stage 3)

	Baseline - 7 ccf	Stage 3 - 30% Reduction	Stage 3 - No Reduction
Stage Charge	$0.00	$30.31	$47.82
Commodity Charge	$85.05	$53.91	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.08	$164.74

SFPUC Pass-through Wholesale Water Shortage Rate

In addition to adding the water shortage contingency stage rates to the District's Rate and Fee schedule, staff also recommends that a SFPUC pass-through wholesale water shortage rate clause also be included. If SFPUC implements an additional unit wholesale charge to the cost to their water as a result of a water shortage, the District may pass through this per unit wholesale charge to their customers rate ~~bas~~ed on the percentage of the District's total water supply purchased from SFPUC. The District's

only other source of water is local surface and groundwater which does not require any additional water supply costs to obtain. Therefore, the proportion of the pass-through charge will be a direct proportion of how much SFPUC water is purchased to meet demand versus how much water is locally sourced. The equation below shows an example of how the SFPUC per unit wholesale charge related to a water shortage may be passed through when SFPUC is charging an additional $0.50 per unit of water (hcf) and the District is purchasing 90% of its water from SFPUC and using 10% local water sources to meet the rest of demand.

$$\$0.50\ per\ hcf\ SFPUC\ additional\ cost * 90\%\ SFPUC\ water\ purchases = \$0.45\ passthrough\ charge\ to\ commodity\ rates$$

Statute of Limitations For Challenging Proposed Rates

Pursuant to California Government Code Section 53759, there is a 120-day statute of limitations for challenging the water shortage contingency stage rates and the SFPUC pass-through wholesale water shortage rates or surcharges from the date the Board of Directors adopts the resolution approving these rates.

Recommendation

District staff recommends that these water shortage contingency stage rates and the SFPUC pass-through wholesale water shortage rate clause be considered by the Board of Directors to be added to the District's Rate and Fee Schedule. Once added to the Rate and Fee Schedule, the Board of Directors, at its discretion, could implement the rates if any stage of the 2020 Water Shortage Contingency Plan has been activated. Prior to implementing a water shortage contingency stage rate or SFPUC wholesale pass-through, the District will send written notification to all customers and property owners of record at least 30 days prior to the effective date.

Schedule a Public Hearing and Authorize Issuance of Proposition 218 Notice

In order to comply with the requirements of Proposition 218, the recommended Board action would be to schedule a public hearing on January 11, 2022 and authorize issuance of a notice of a public hearing on January 11, 2022 to amend the District's Rate and Fee Schedule to include water shortage contingency stage rates and a SFPUC pass-through wholesale water shortage rates or surcharges, if imposed by SFPUC in a water shortage. Following the public hearing, the Board can adopt the amended Rate and Fee Schedule. If a majority of affected property owners submit written protests, the amendment to include the water shortage contingency stage rates and the SFPUC pass-through wholesale water shortage rates or surcharges cannot be adopted.

Coastside
COUNTY WATER DISTRICT

Water Shortage Contingency Stage Rate Study

Draft Report / November 2021

RAFTELIS

COASTSIDE COUNTY WATER DISTRICT

RAFTELIS

November 5, 2021

Mary Rogren
General Manager
Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019

Subject: Water Shortage Contingency Stage Rate Study Report

Dear Mary Rogren,

Raftelis Financial Consultants, Inc. (Raftelis), assisted by Water Resources Economics, is pleased to provide this Water Shortage Contingency Stage Rate Study Report to the Coastside County Water District (District). Water shortage contingency stage rates (stage rates) are a tool that will allow the District to reliably recover the necessary revenue to fully fund the water system in times of reduced water demand.

The major objectives of the study include the following:

- Determine water allocations for each customer class during each water shortage stage based on the 2020 Water Shortage Contingency Plan
- Calculate the financial impacts of reduced water sales and changes to water supply sources
- Evaluate various stage rate structures to determine the structure best suited to meet the District's needs
- Develop stage rates that recover the financial impacts of each water shortage stage based on the cost of providing service

The report summarizes the key findings and recommendations related to the development of stage rates for the District. It has been a pleasure to work with the District on this project, and thank you for the support that you, District staff, and the Board of Directors provided during the course of this study.

Sincerely,

Nancy Phan
Project Manager
Raftelis

Sanjay Gaur
Project Director/Principal
Water Resources Economics

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1. Executive Summary

Background

The Coastside County Water District provides treated water service to the City of Half Moon Bay and the communities of Princeton-by-the-Sea, Miramar, and El Granada in San Mateo County. The service area spans 14 square miles and provides service to a population of approximately 18,700 covering 7,600 accounts. The District receives raw water from two sources: local water (surface and groundwater) and imported water purchased from the San Francisco Public Utilities Commission (SFPUC).

Raftelis worked with the District in 2020 on a Water Financial Plan and Rate Study Update. In 2021, the District engaged Raftelis to conduct a Water Shortage Contingency Stage Rate Study to accompany the rates developed in the prior rate study update. The District adopted its latest 2020 Water Shortage Contingency Plan in June 2021, which details the six water shortage stages and the corresponding water usage reductions. The resulting stage rates comply with Proposition 218 requirements and allow the District to reliably recover the necessary revenue to fully fund the water system in times of reduction in water demand.

The major objectives of the study include the following:

- Determine water allocations for each customer class during each water shortage stage based on the 2020 Water Shortage Contingency Plan
- Calculate the financial impacts of reduced water sales and changes to water supply sources
- Evaluate various stage rate structures to determine the structure best suited to meet the District's needs
- Develop stage rates that recover the financial impacts of each water shortage stage based on the cost of providing service

Legal Framework[1]

The rate-making process, especially for water agencies in California, begins with a review of the legal requirements and framework currently in place. The major legal requirements include Proposition 218 and Article X, Section 2 of the California Constitution, which are outlined in the following sections.

California Constitution – Article XIII D, Section 6 (Prop 218)

Proposition 218, reflected in the California Constitution as Article XIII D, was enacted in 1996 to ensure that rates and fees are proportional to the cost of providing service. The principal requirements for fairness of the fees, as they relate to public water service, are as follows:

1. A property-related charge (such as water and recycled water rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property-related service.
1. Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
2. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.

[1] Raftelis does not practice law, nor does it provide legal advice. The above discussion provides a general overview of Raftelis' understanding as rate practitioners and is labeled "legal framework" for literary convenience only. The District should consult with its legal counsel for clarification and/or specific guidance.

3. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of the property.
4. A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing when the agency considers all written protests against the charge.

As stated in AWWA's Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1, 7th Edition (M1 Manual), "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Proposition 218 requires that water rates cannot be "arbitrary and capricious," meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged. This study follows industry-standard rate-setting methodologies set forth by the M1 Manual and adheres to Proposition 218 requirements by developing rates that do not exceed the proportionate cost of providing water services during each water shortage contingency stage.

California Constitution – Article X, Section 2

Article X, Section 2 of the California Constitution (established in 1976) states the following:

> *It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.*

Article X, Section 2 of the State Constitution institutes the need to preserve the State's water supplies and to discourage the wasteful or unreasonable use of water by encouraging conservation. As such, public agencies are constitutionally mandated to maximize the beneficial use of water, prevent waste, and encourage conservation.

Process and Approach

Stage rates are governed by the requirements of Proposition 218 and Article X of the California Constitution. The development of the stage rates must show the nexus between the costs of providing water service and the rates charged to customers, must maximize the beneficial use of water (often defined as indoor use for health and hygiene), and must encourage conservation. Since the District has already implemented a water shortage advisory, which asks customers to voluntarily reduce water use by 15 percent, ensuring that water is both used efficiently and conserved when possible is particularly important.

Stage rates are designed to recover lost revenue due to reduction in water use during each stage, to incorporate the potential changes to the District's water supply sources and their corresponding costs, to align with specific water shortage stages outlined in the 2020 Water Shortage Contingency Plan, and to provide financial flexibility for the District when declaring water shortage stages and implementing the appropriate stage rates. The proposed stage rates are based on the District's approved water rates for calendar year (CY) 2022, which will go into effect on January 1, 2022.

There are four steps to conducting a stage rate study, which include:

1. Allocating water reductions between various customer classes based on defined water shortage stages
2. Calculating financial impacts to the District in each stage
3. Determining the most appropriate water shortage cost recovery mechanism (rate structure)
4. Evaluating financial impacts to customers

For the first step of the stage rate study, District staff provided the Water Shortage Contingency Plan which was adopted in June 2021 as part of the District's Urban Water Management Plan. **Table 1-1** shows the overall reduction targets for the entire water system.

Table 1-1: Water Shortage Stages and Reduction

Line	Water Shortage Reductions	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Overall Target Reduction	0%	≤10%	20%	30%	40%	50%	>50%

The water sales by stage are calculating using the target reductions developed in the Water Shortage Contingency Plan. **Table 1-2** shows the estimated water sales in hundred cubic feet (hcf) for each stage of water shortage that aligns with the percent reductions shown above in **Table 1-1**. Baseline is defined as the water usage estimated in CY 2022.

Table 1-2: Estimated Water Sales by Stage

	A	B	C	D	E	F	G	H
Line	Water Usage (hcf)	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	All Customer Classes	815,000	727,838	643,850	570,500	497,766	408,064	266,424
2	% Reduction from Baseline	0%	11%	21%	30%	39%	50%	67%

A key step in the stage rate study is to calculate the financial implications for the District during a water shortage. Considerations include:

- How much commodity revenue is expected due to cutbacks?
- How much will this change the District's water supply mix and the costs associated with each source?
- How will this change the District's operating costs, if at all?

For the District, these financial consequences include loss of commodity revenue, the severity of which depends on the water shortage stage. Additionally, changes in water purchase costs from the SFPUC are expected to lead to financial consequences with a shift in water supply mix from cheaper local water to more expensive SFPUC water.

The next step in developing stage rates involves determining the most appropriate water shortage cost recovery mechanism is best suited to meet the needs of the District and its policy objectives. Raftelis evaluated three options to recover water shortage costs:

1. Uniform quantity charge
2. Uniform percent increase to quantity charge
3. Fixed charge based on meter size

Based on direction provided by the District's Board of Directors and staff, the resulting stage rates were developed as a uniform percent increase to the approved quantity charges for CY 2022, which allows for the ability for customers to change their water bill, encourages conservation, and promotes affordability while being simple for customers to understand.

Proposed Stage Rates

Table 1-3 shows the proposed stage rates for each customer class for Stages 1 through 6. The stage rates for each stage are calculated based on a percentage increase that is applied to the CY 2022 quantity charges for each customer class. The percentage increase was established by calculating the total financial impacts of each stage of

water shortage to determine the amount of revenue required to recover the lost revenue in each stage. The stage rates are charged per hundred cubic feet (hcf) of water use.

Based on Proposition 218 requirements, the resulting stage rates are the maximum that the Board of Directors can implement. Additional costs charged by SFPUC above those outlined in this study can be passed through to the District's customers. Pass-through rates are discussed further in the section below. When officially declaring a water shortage stage, the Board has the discretion to implement a lower stage rate, use reserves to make up for lost revenue, defer capital projects to reduce total expenditures, or a combination of those three strategies to best meet the needs of the District and the communities it serves.

Table 1-3: Proposed Stage Rates ($/hcf)

	A	B	C	D	E	F	G
Line	Customer Class	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential						
2	Tier 1	$2.24	$4.01	$5.70	$7.96	$12.09	$24.04
3	Tier 2	$3.27	$5.87	$8.34	$11.64	$17.68	$35.15
4	Tier 3	$3.95	$7.09	$10.09	$14.08	$21.38	$42.52
5	Multi-Family Residential	$2.98	$5.35	$7.60	$10.61	$16.11	$32.05
6	Non-Residential	$3.17	$5.70	$8.10	$11.31	$17.17	$34.16

Table 1-4 shows the combined quantity charges and stage rates. The Baseline quantity charges (Column B) are based on the District's CY 2022 water rates. The combined rates are equal to the Baseline quantity charges plus the proposed stage rates for each stage detailed in **Table 1-3**.

Table 1-4: Proposed Quantity Charges and Stage Rates ($/hcf)

	A	B	C	D	E	F	G	H
Line	Customer Class	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential							
2	Tier 1	$10.14	$12.38	$14.15	$15.84	$18.10	$22.23	$34.18
3	Tier 2	$14.83	$18.10	$20.70	$23.17	$26.47	$32.51	$49.98
4	Tier 3	$17.94	$21.89	$25.03	$28.03	$32.02	$39.32	$60.46
5	Multi-Family Residential	$13.52	$16.50	$18.87	$21.12	$24.13	$29.63	$45.57
6	Non-Residential	$14.41	$17.58	$20.11	$22.51	$25.72	$31.58	$48.57

Pass-Through Rates

During a water shortage, SFPUC can implement its own water shortage contingency stage rates (independent of the District's proposed stage rates described in this report), which would be applied as an increased cost per hcf of water. The District can pass on any additional water purchase costs it incurs onto its customers using pass-through rates. If SFPUC implements an additional cost per hcf of water as a result of a water shortage, the District may charge its customers a proportion of that rate based on the percentage of the total water supply purchased from SFPUC. The District's only other source of water is local surface and groundwater which does not require any additional water supply costs to obtain. Therefore, the proportion of the pass-rate charge will be a direct proportion of how much SFPUC water is purchased to meet demand versus how much water is locally available. The equation below shows an example of a pass through rate when SFPUC is charging an additional $0.50 per hcf of water and the District is purchasing 90 percent of its water from SFPUC and using 10 percent local water sources to meet the rest of demand.

$0.50 per hcf additional cost for SFPUC water x 90% SFPUC water purchases = $0.45 per hcf pass-through rate applied to quantity charges

Pass-through rates can be applied if SFPUC increases the cost per unit of water due to a water shortage and are in addition to the District's quantity charge and stage rates (depending on water shortage contingency stage declared by the District).

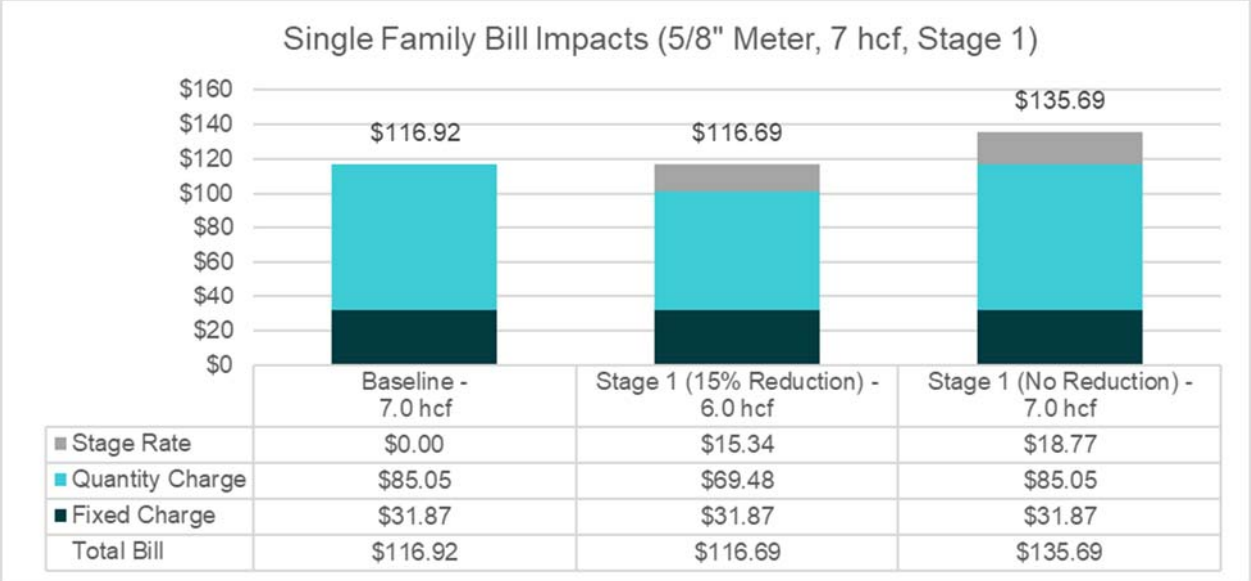
Customer Impacts

Figure 1-1, **Figure 1-2**, and **Figure 1-3** show the bill impacts for Stages 1, 2, and 3 of water shortage, respectively, for a Single Family Residential customer with a 5/8" meter using 7 hcf of water per month. The District's customer base is predominantly residential. Within the Single Family Residential class, the 5/8" meter size is the most common and the average water use per month is approximately 7 hcf.

The figures show the impacts in each stage based on the components of the customer bill, which includes the fixed charge by meter size, the quantity charge per hcf of use, and the stage rate per hcf of use. The fixed charge by meter size does not change based on water shortage stages or water usage. The three stacked bars in each figure show the difference between the baseline scenario (no water shortage), the water shortage scenario with commensurate reduction in water use (meaning that the customer reduces their water use based on the declared water shortage stage), and the water shortage scenario without reduction in water use (meaning that the customer does not reduce their water use even when a water shortage stage has been declared).

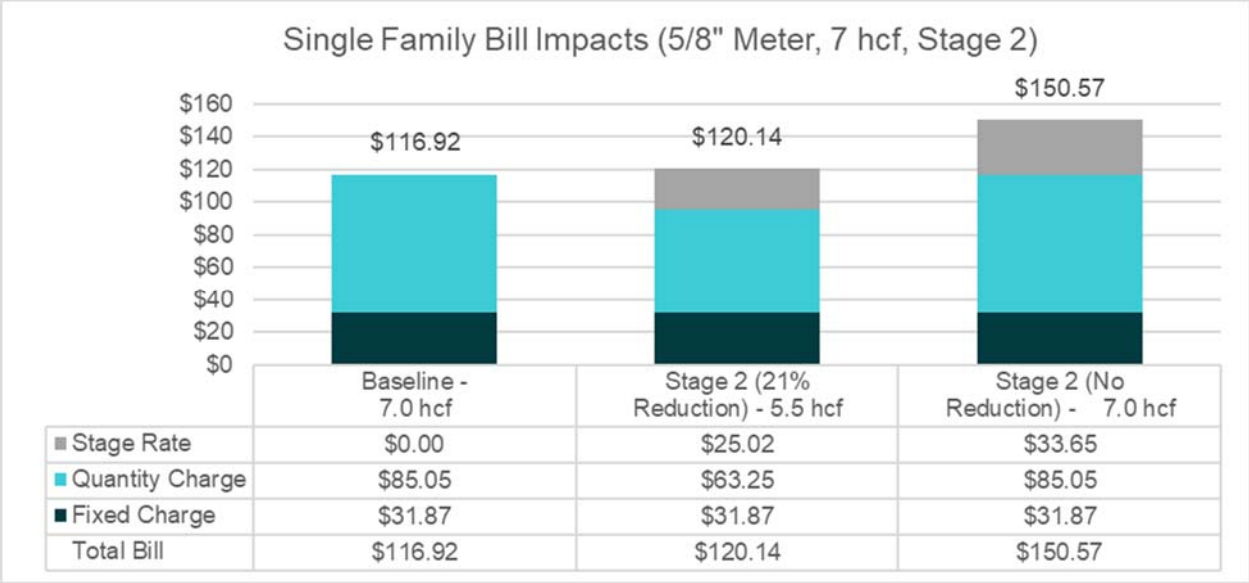
The figures demonstrate that when the District's customers comply with the recommended water usage reductions as defined by the Water Shortage Contingency Plan, there will not be a significant impact to their water bill. However, if customers do not comply with the recommended water usage reductions, then the impact to their water bill can be significant. The stage rates are designed to allow the District's customers to control their water bill, to encourage conservation, and to promote affordability. The results of the customer impact analysis demonstrate the effect of these policy objectives: the customers that reduce their water use based on each water shortage stage will see a minimal impact to their monthly water bill.

Figure 1-1: Single Family Residential Customer Impacts (Stage 1)



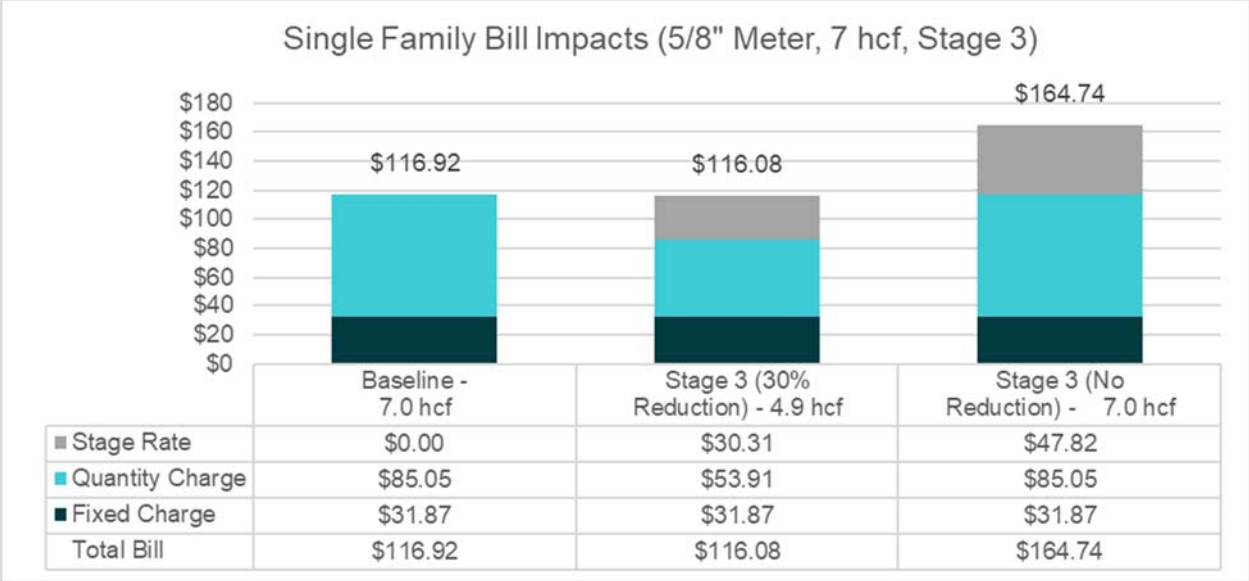
	Baseline - 7.0 hcf	Stage 1 (15% Reduction) - 6.0 hcf	Stage 1 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$15.34	$18.77
Quantity Charge	$85.05	$69.48	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.69	$135.69

Figure 1-2: Single Family Residential Customer Impacts (Stage 2)



	Baseline - 7.0 hcf	Stage 2 (21% Reduction) - 5.5 hcf	Stage 2 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$25.02	$33.65
Quantity Charge	$85.05	$63.25	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$120.14	$150.57

Figure 1-3: Single Family Residential Customer Impacts (Stage 3)



	Baseline - 7.0 hcf	Stage 3 (30% Reduction) - 4.9 hcf	Stage 3 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$30.31	$47.82
Quantity Charge	$85.05	$53.91	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.08	$164.74

2. Water Shortage Allocations and Costs

This section of the report details the water usage allocations and financial impacts of each water shortage stage, which results in the total amount of revenue to be collected from stage rates in each stage. Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report.

Water Allocations

The first step in the development of stage rates involves allocating water usage reductions between the District's customer classes based on the water shortage stages defined in the Water Shortage Contingency Plan. **Table 2-1** shows the water usage reductions for Single Family Residential, Multi-Family Residential, and Non-Residential customers for Stages 1 through 6. The water usage reductions for each customer class are designed to meet the target reduction goal for the entire water system in each stage.

Table 2-1: Water Shortage Stages and Reduction

	A	B	C	D	E	F	G
Line	Customer Class	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential	15%	21%	30%	36%	41%	52%
2	Multi-Family Residential	14%	21%	30%	35%	41%	52%
3	Non-Residential	5%	21%	30%	43%	62%	88%
4							
5	Overall Target Reduction	≤10%	20%	30%	40%	50%	>50%

Water usage by customer class for each water shortage stage are calculated once the water reductions are determined. **Table 2-2** shows the estimated water usage in hcf for each stage of water shortage that aligns with the percent reductions for each class (**Table 2-1**). Baseline use (Column B) is equal to the estimated water use in CY 2022. The percent reduction from Baseline (Line 5) is the difference between the total usage in Stages 1 through 6 compared to the Baseline scenario. Note that the percent reduction from Baseline is approximately equal to the target reduction for the system (**Table 2-1**, Line 5).

Table 2-2: Estimated Water Usage by Stage

	A	B	C	D	E	F	G	H
Line	Customer Class	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential	425,619	361,776	336,239	297,933	272,396	251,115	204,297
2	Multi-Family Residential	42,781	36,791	33,797	29,946	27,807	25,241	20,535
3	Non-Residential	346,600	329,270	273,814	242,620	197,562	131,708	41,592
4	**Total (hcf)**	**815,000**	**727,838**	**643,850**	**570,500**	**497,766**	**408,064**	**266,424**
5	% Reduction from Baseline	0%	11%	21%	30%	39%	50%	67%

Table 2-3 shows the usage breakdown by tier for Single Family Residential customers that matches the estimated water usage by stage for the entire class (**Table 2-2**, Line 1). The District's customer base is very conservation-oriented and uses a low amount of water per capita, particularly for outdoor irrigation. The usage in the higher tiers is reduced first, with reductions in the first tier occurring only during Stage 6. This methodology prioritizes

usage in the lower tiers (which represents essential water consumption for indoor needs), aligns with the requirements of Article X to maximize the beneficial use of water, and best reflects the usage characteristics and patterns of the District's customer base.

Table 2-3: Water Usage by Water Shortage Stage

Line	A Customer Class	B Baseline	C Stage 1	D Stage 2	E Stage 3	F Stage 4	G Stage 5	H Stage 6
1	Single Family Residential	425,619	361,776	336,239	297,933	272,396	251,115	204,297
2	Tier 1	*248,638*	*248,638*	*248,638*	*248,638*	*248,638*	*248,638*	*204,297*
3	Tier 2	*115,905*	*113,139*	*87,601*	*49,296*	*23,759*	*2,478*	*0*
4	Tier 3	*61,076*	*0*	*0*	*0*	*0*	*0*	*0*
5								
6	Multi-Family Residential	42,781	36,791	33,797	29,946	27,807	25,241	20,535
7	Non-Residential	346,600	329,270	273,814	242,620	197,562	131,708	41,592
8	**Total (hcf)**	**815,000**	**727,838**	**643,850**	**570,500**	**497,766**	**408,064**	**266,424**

Financial Impacts

The next step in the stage rate study is to determine the financial impacts to the District during each stage of water shortage. The cost implications of water shortages consider the following:

- Lost quantity charge revenue due to water usage reductions in each water shortage stage
- Potential changes to operating costs, which include water supply sources and the associated costs

For the District, the most significant financial consequence is the loss of consumption-based revenue, the severity of which depends on the water shortage stage. Additionally, water shortage conditions impact the District's access to local water sources, which necessitates purchasing more expensive imported water from SFPUC to meet customer demands.

The water shortage cost analysis uses CY 2022 rates, shown in **Table 2-4**, to calculate the quantity charge revenue for the Baseline scenario and for Stages 1 through 6. CY 2022 rates will be implemented on January 1, 2022.

Table 2-4: CY 2022 Quantity Charges ($/hcf)

Line	A Quantity Charges ($/hcf)	B CY 2022
1	Single Family Residential	
2	Tier 1	$10.14
3	Tier 2	$14.83
4	Tier 3	$17.94
5	Multi-Family Residential	$13.52
6	Non-Residential	$14.41

Table 2-5 shows the quantity charge revenue for Stages 1 through 6 compared to the Baseline scenario, which is calculated based on the CY 2022 quantity charges (**Table 2-4**) multiplied by the estimated water usage by water shortage stage for each customer class (**Table 2-3**). The difference in quantity charge revenue (Line 9) is equal to the difference between the Baseline revenue and the estimated revenue for Stages 1 through 6, which represents the amount of lost quantity charge revenue in each stage.

Table 2-5: Difference in Quantity Charge Revenue

Line	A Customer Class	B Baseline	C Stage 1	D Stage 2	E Stage 3	F Stage 4	G Stage 5	H Stage 6
1	Single Family Residential							
2	Tier 1	$2,521,186	$2,521,186	$2,521,186	$2,521,186	$2,521,186	$2,521,186	$2,071,573
3	Tier 2	$1,718,878	$1,677,846	$1,299,130	$731,056	$352,340	$36,743	$0
4	Tier 3	$1,095,703	$0	$0	$0	$0	$0	$0
5	Multi-Family Residential	$578,394	$497,419	$456,931	$404,876	$375,956	$341,252	$277,629
6	Non-Residential	$4,994,510	$4,744,784	$3,945,663	$3,496,157	$2,846,871	$1,897,914	$599,341
7	**Total**	**$10,908,671**	**$9,441,234**	**$8,222,909**	**$7,153,274**	**$6,096,352**	**$4,797,095**	**$2,948,544**
8								
9	**Difference in Quantity Charge Revenue**		**$1,467,437**	**$2,685,762**	**$3,755,397**	**$4,812,319**	**$6,111,576**	**$7,960,127**

Based on the Water Shortage Contingency Plan, the availability of water from the District's water supply sources are also impacted due to water shortage. The District currently has two sources of water: local water (surface and groundwater) and imported water purchased from SFPUC. The amount of water available to the District from local water sources is reduced during water shortage conditions, meaning that the District must purchase imported water from SFPUC to meet customer demand.

Table 2-6 shows the percentage of water supplied by local water and imported water from SFPUC. A significant portion of demand is met using local water during normal conditions. However, under water shortage conditions, the availability of local water is reduced. Beginning in Stage 2, local water sources are depleted, and the District is fully reliant on imported water from SFPUC.

Table 2-6: Water Supply Sources

	A	B	C	D	E	F	G	H
Line	Water Supply Sources	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Local Water	38%	10%	0%	0%	0%	0%	0%
2	SFPUC	62%	90%	100%	100%	100%	100%	100%

Table 2-7 shows the water produced from both sources during each stage of water shortage. Water demand (Line 1) is equal to the total estimated water usage for all classes in each stage (**Table 2-3**, Line 8). Water production (Line 3) is equal to water demand plus a portion of system water loss (Line 2). The amount of water produced from each source is based on the percentages from **Table 2-6**.

Although total water production in Stages 1 through 3 is less than Baseline, the amount of water purchased from SFPUC in those stages are actually greater than the amount purchased in the Baseline scenario due to the shifts in water supply availability by source. The District is expected to purchase less water from SFPUC in Stages 4 through 6 compared to the Baseline scenario.

Table 2-7: Water Production by Source

	A	B	C	D	E	F	G	H
Line	Water Production	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Water Demand (hcf)	815,000	727,838	643,850	570,500	497,766	408,064	266,424
2	System Water Loss	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%
3	Water Production (hcf)	886,834	791,989	700,598	620,783	541,639	444,030	289,906
4								
5	Local Water	336,997	79,199	0	0	0	0	0
6	SFPUC	549,837	712,790	700,598	620,783	541,639	444,030	289,906
7	**Total (hcf)**	**886,834**	**791,989**	**700,598**	**620,783**	**541,639**	**444,030**	**289,906**

Table 2-8 shows the estimated water purchase costs from SFPUC for each water shortage stage. The District purchases raw water from SFPUC, which is reflected in the variable rate per hcf of water (Line 1). The amount of water purchased (Line 3) is based on the amount of water produced from SFPUC (**Table 2-7**, Line 6). The water purchase costs (Line 4) are calculated by multiplying the variable rate by the amount of water purchased. The difference in water purchase costs (Line 6) is equal to the difference between the water purchase costs from SFPUC in Stages 1 through 6 compared to the Baseline scenario.

In Stages 1 through 3, due to the reduction in local water supply availability, the costs of purchasing water from SFPUC are greater than in the Baseline scenario. In Stages 4 through 6, the District will see cost savings for purchased water due to significant reductions in water use.

Table 2-9 shows the total water shortage costs for Stages 1 through 6, which include the lost quantity charge revenue (**Table 2-5**, Line 9) and the difference in water purchase costs from SFPUC (**Table 2-8**, Line 6). The total water shortage costs are the amount of revenue that the proposed stage rates are designed to recover.

Table 2-10 shows the water shortage revenue requirement and the resulting percent increase needed to recover the necessary water shortage costs. The expected revenue (Line 1) is based on the estimated quantity charge revenue for each stage (**Table 2-5**, Line 7). The water shortage revenue requirement (Line 2) is equal to the expected quantity charge revenue plus the total water shortage costs in each stage (**Table 2-9**, Line 3). The percent increase (Line 3) is calculated based on the percent difference between the water shortage revenue requirement and the expected quantity charge revenue for each stage. For example, the following formula is used to derive the percent increase for Stage 1:

[Stage 1 water shortage revenue requirement (Column C, Line 2) - Stage 1 expected quantity charge revenue (Column C, Line 1)] / Stage 1 expected quantity charge revenue (Column C, Line 1)

Table 2-8: SFPUC Water Purchase Costs

Line	A Water Purchase Costs	B Baseline	C Stage 1	D Stage 2	E Stage 3	F Stage 4	G Stage 5	H Stage 6
1	SFPUC Variable Rate ($/hcf)	$3.74	$3.74	$3.74	$3.74	$3.74	$3.74	$3.74
2								
3	Water Purchased (hcf)	549,837	712,790	700,598	620,783	541,639	444,030	289,906
4	Water Purchase Costs from SFPUC	$2,056,390	$2,665,835	$2,620,238	$2,321,730	$2,025,728	$1,660,674	$1,084,250
5								
6	**Difference in Water Purchase Costs**		**$609,445**	**$563,849**	**$265,341**	**($30,662)**	**($395,716)**	**($972,140)**

Table 2-9: Water Shortage Costs

Line	A Water Shortage Costs to be Recovered	B Stage 1	C Stage 2	D Stage 3	E Stage 4	F Stage 5	G Stage 6
1	Difference in Quantity Charge Revenues	$1,467,437	$2,685,762	$3,755,397	$4,812,319	$6,111,576	$7,960,127
2	Difference in Water Purchase Costs	$609,445	$563,849	$265,341	($30,662)	($395,716)	($972,140)
3	**Total**	**$2,076,882**	**$3,249,610**	**$4,020,738**	**$4,781,657**	**$5,715,860**	**$6,987,987**

Table 2-10: Water Shortage Revenue Requirement

Line	A Water Shortage Revenue Requirement	B Baseline	C Stage 1	D Stage 2	E Stage 3	F Stage 4	G Stage 5	H Stage 6
1	Expected Revenue	$10,908,671	$9,441,234	$8,222,909	$7,153,274	$6,096,352	$4,797,095	$2,948,544
2	Water Shortage Revenue Requirement	$10,908,671	$11,518,116	$11,472,520	$11,174,012	$10,878,009	$10,512,955	$9,936,531
3	% Increase		22%	40%	56%	78%	119%	237%

3. Stage Rates

This section of the report discusses the policy objectives, analyses, and rationale used to determine the stage rate structure and proposed stage rates in each stage. Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report.

Stage Rate Structure

Stage rates are designed to recover the financial impacts due to water shortages and are intended as a revenue-generating mechanism. Due to this, stage rates are subject to Proposition 218 requirements, which necessitates a clear nexus between the costs of water shortage and the stage rates charged to the District's customers.

The next step after determining the water shortage costs by stage is evaluating the water shortage cost recovery mechanism, or stage rate structure, that best meets the needs of the District and its customers. In this study, Raftelis evaluated three options to recover water shortage costs:

1. Uniform quantity charge: the same charge per hcf of water is applied to all quantity charges, regardless of customer class or tier
2. Uniform percent increase to quantity charge: the same percentage increase is applied to all quantity charges, regardless of customer class or tier
3. Fixed charge based on meter size: a monthly fixed charge by meter size, which is not tied to usage, is applied to customer bills

Figure 3-1 shows the policy objectives considered for each stage rate structure. Raftelis worked closely with District staff and the Board of Directors to select the stage rate structure that best meets the policy objectives of the District, which includes allowing customers the option to control their water bills, promoting affordability (especially for beneficial use), and encouraging conservation according to meet the reduction targets in each water shortage stage. Based on direction from the Board of Directors and District staff, Raftelis recommends the uniform percent increase to the quantity charge, which is the stage rate structure best suited to meet the District's needs.

Figure 3-1: Policy Objectives for Stage Rate Structures

Policy Objectives	Uniform Quantity Charge	Uniform Percentage	Monthly Fixed Meter Charge
Easy to understand and administer	★★	★★	★★★
Stability and guaranteed recovery of revenue	★★	★	★★★
Ability to change the bill	★★	★★★	★
Targeted use and conservation	★★	★★★	★
Promotes affordability	★★	★★★	★

Proposed Stage Rates

Table 3-1 shows the proposed stage rates for each customer class for Stages 1 through 6. The stage rates for each water shortage stage are calculated based on a percentage increase that is applied to the CY 2022 quantity charges for each customer class. The CY 2022 quantity charges for each class and tier (**Table 2-4**) are multiplied by the percent increase for each water shortage stage (**Table 2-10**) to determine the stage rate.

Based on Proposition 218 requirements, the resulting stage rates are the maximum that the Board of Directors can implement. Additional costs charged by SFPUC above those outlined in this study can be passed through to the District's customers. When officially declaring a water shortage stage, the Board has the discretion to implement a lower stage rate, use reserves to make up for lost revenue, defer capital projects to reduce total expenditures, or a combination of those three strategies to best meet the needs of the District and the communities it serves.

Table 3-1: Proposed Stage Rates ($/hcf)

	A	B	C	D	E	F	G
Line	Customer Class	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential						
2	Tier 1	$2.24	$4.01	$5.70	$7.96	$12.09	$24.04
3	Tier 2	$3.27	$5.87	$8.34	$11.64	$17.68	$35.15
4	Tier 3	$3.95	$7.09	$10.09	$14.08	$21.38	$42.52
5	Multi-Family Residential	$2.98	$5.35	$7.60	$10.61	$16.11	$32.05
6	Non-Residential	$3.17	$5.70	$8.10	$11.31	$17.17	$34.16

Table 3-2 shows the combined quantity charges and stage rates. The Baseline quantity charges (Column B) are based on the District's CY 2022 water rates (**Table 2-4**). The combined rates are equal to the Baseline quantity charges plus the proposed stage rates for each stage detailed in **Table 3-1**.

Table 3-2: Proposed Quantity Charges and Stage Rates ($/hcf)

	A	B	C	D	E	F	G	H
Line	Customer Class	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Single Family Residential							
2	Tier 1	$10.14	$12.38	$14.15	$15.84	$18.10	$22.23	$34.18
3	Tier 2	$14.83	$18.10	$20.70	$23.17	$26.47	$32.51	$49.98
4	Tier 3	$17.94	$21.89	$25.03	$28.03	$32.02	$39.32	$60.46
5	Multi-Family Residential	$13.52	$16.50	$18.87	$21.12	$24.13	$29.63	$45.57
6	Non-Residential	$14.41	$17.58	$20.11	$22.51	$25.72	$31.58	$48.57

Customer Impacts

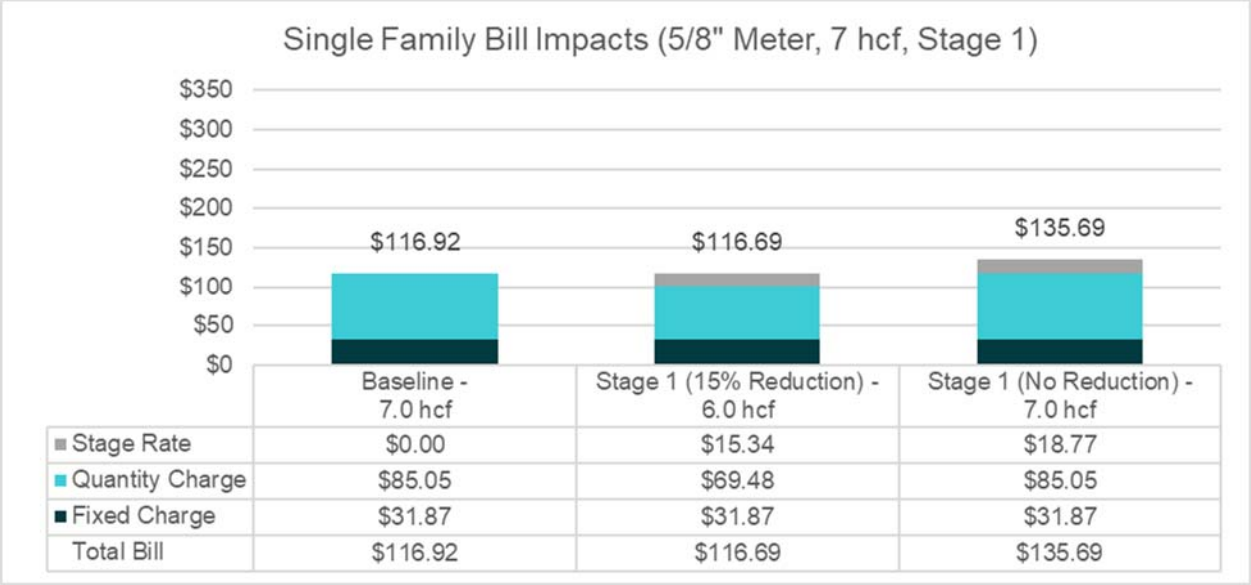
Figure 3-2 through **Figure 3-7** show the bill impacts for Stages 1 through 6, respectively, for a Single Family Residential customer with a 5/8" meter using 7 hcf of water per month. The District's customer base is predominantly residential. Within the Single Family Residential class, the 5/8" meter size is the most common and the average water use per month is approximately 7 hcf.

The figures show the impacts in each stage based on the components of the customer bill, which includes the fixed charge by meter size, the quantity charge per hcf of use, and the water shortage charge per hcf of use. The fixed charge by meter size does not change based on water shortage stages or water usage. The three stacked bars in each

figure show the difference between the baseline scenario (no water shortage), the water shortage scenario with commensurate reduction in water use (meaning that the customer reduces their water use based on the declared water shortage stage), and the water shortage scenario without reduction in water use (meaning that the customer does not reduce their water use even when a water shortage stage has been declared).

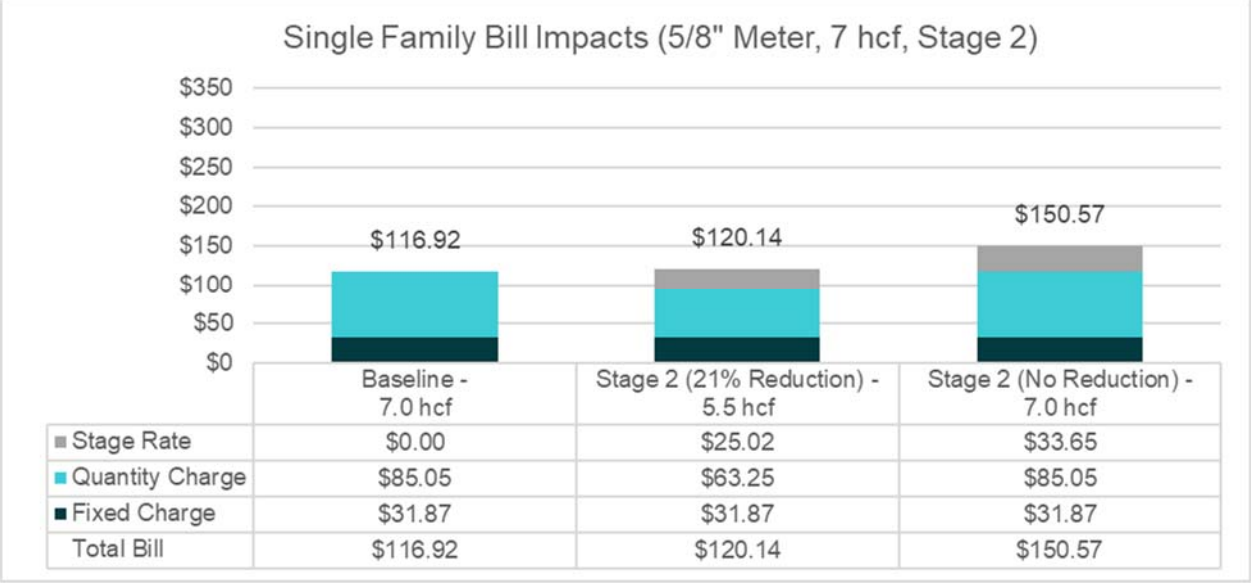
The figures demonstrate that when the District's customers comply with the recommended water usage reductions as defined by the Water Shortage Contingency Plan, the impact to customer bills will be minimal in Stages 1 through 4 and reasonable in Stages 5 and 6 given the severity of the water use reductions. However, if customers do not comply with the recommended water usage reductions, then the impact to their water bill can be significant.

Figure 3-2: Single Family Residential Customer Impacts (Stage 1)



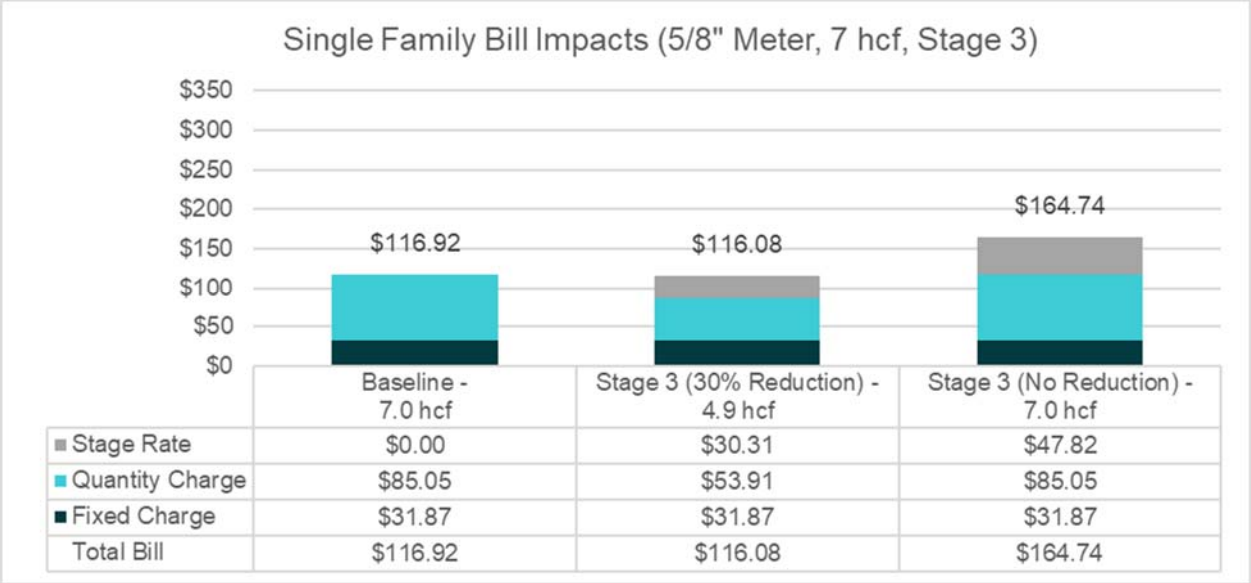
	Baseline - 7.0 hcf	Stage 1 (15% Reduction) - 6.0 hcf	Stage 1 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$15.34	$18.77
Quantity Charge	$85.05	$69.48	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.69	$135.69

Figure 3-3: Single Family Residential Customer Impacts (Stage 2)



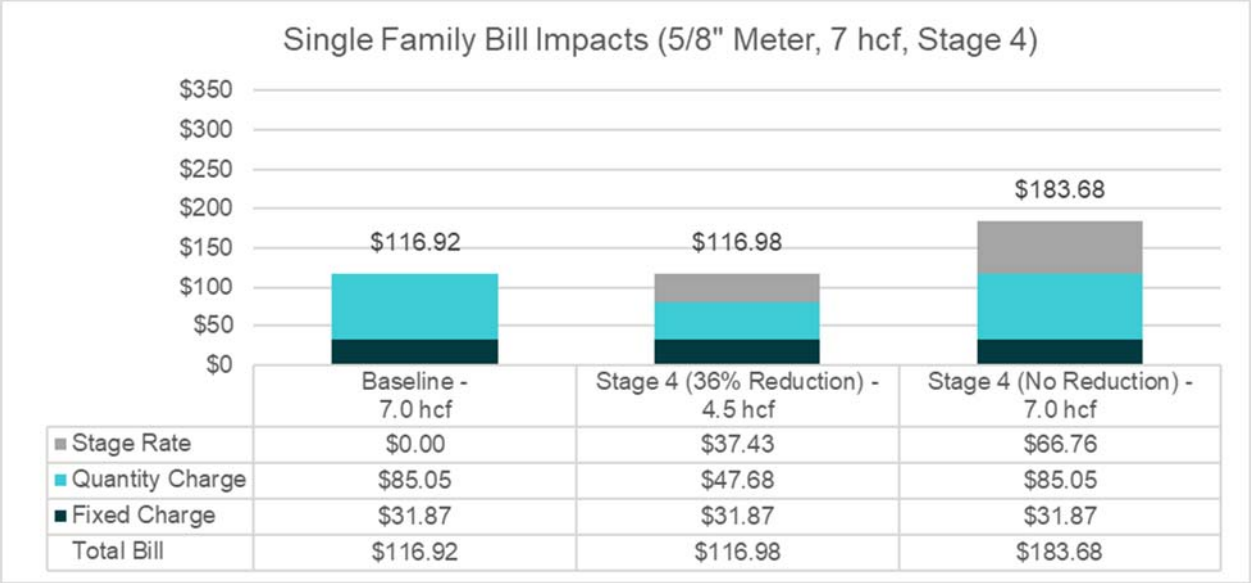
	Baseline - 7.0 hcf	Stage 2 (21% Reduction) - 5.5 hcf	Stage 2 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$25.02	$33.65
Quantity Charge	$85.05	$63.25	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$120.14	$150.57

Figure 3-4: Single Family Residential Customer Impacts (Stage 3)



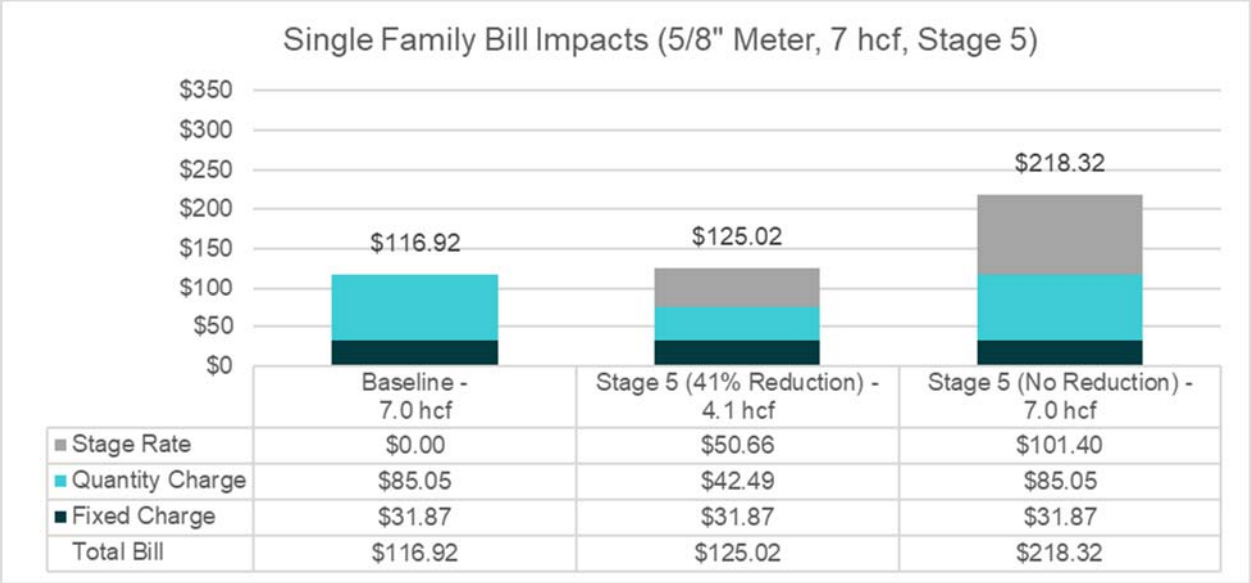
	Baseline - 7.0 hcf	Stage 3 (30% Reduction) - 4.9 hcf	Stage 3 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$30.31	$47.82
Quantity Charge	$85.05	$53.91	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.08	$164.74

Figure 3-5: Single Family Residential Customer Impacts (Stage 4)



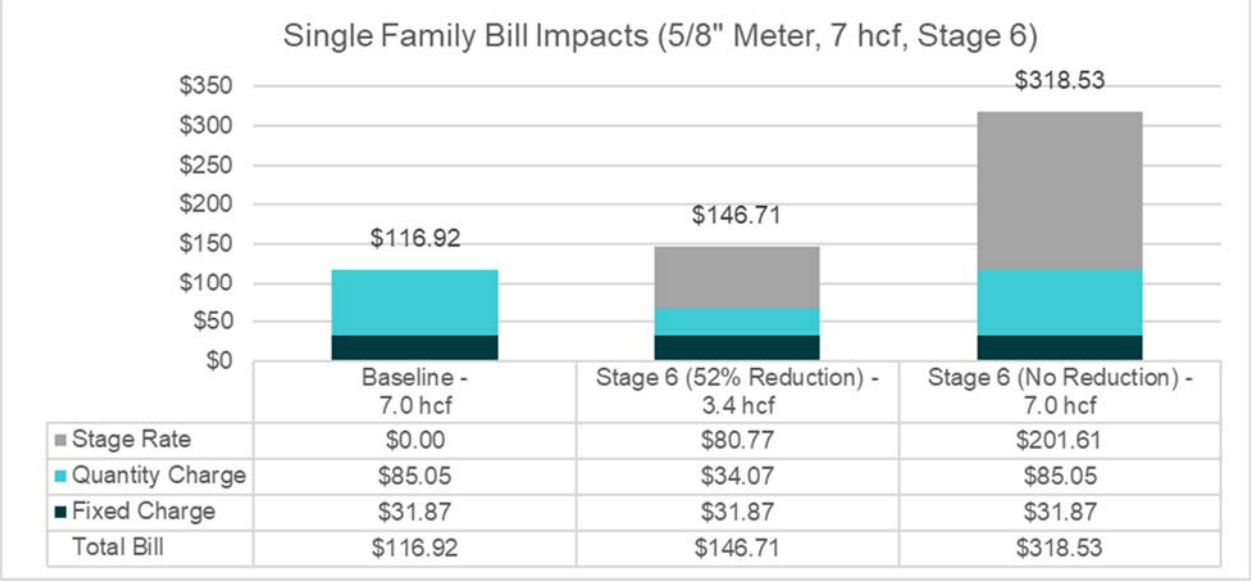
	Baseline - 7.0 hcf	Stage 4 (36% Reduction) - 4.5 hcf	Stage 4 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$37.43	$66.76
Quantity Charge	$85.05	$47.68	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.98	$183.68

Figure 3-6: Single Family Residential Customer Impacts (Stage 5)



	Baseline - 7.0 hcf	Stage 5 (41% Reduction) - 4.1 hcf	Stage 5 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$50.66	$101.40
Quantity Charge	$85.05	$42.49	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$125.02	$218.32

Figure 3-7: Single Family Residential Customer Impacts (Stage 6)



	Baseline - 7.0 hcf	Stage 6 (52% Reduction) - 3.4 hcf	Stage 6 (No Reduction) - 7.0 hcf
Stage Rate	$0.00	$80.77	$201.61
Quantity Charge	$85.05	$34.07	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$146.71	$318.53

NOTICE OF PUBLIC HEARING

Proposed Amendment to the Water Rate Schedule

WATER SHORTAGE CONTINGENCY STAGE RATES

To: Customer/Record Property Owner

Living in California means that Californians are faced with water shortages during drought conditions, natural disasters, or catastrophic infrastructure failures. In its current Water Shortage Contingency Plan (required by California Water Code Section 10632), Coastside County Water District ("District") staff outlined recommended actions and procedures for managing water supply and demand during water shortages with six water shortage levels described as stages. These stages are:

1 – Water Shortage Advisory (up to 10%)
2- Water Shortage Emergency Warning (up to 20%)
3 – Water Shortage Emergency (up to 30%)
4 – Water Shortage Severe Emergency (up to 40%)
5 – Water Shortage Extreme Emergency (up to 50%)
6 – Water Shortage Catastrophic Emergency (>50%)

Successful water rationing programs result in reduced water sales and increased costs to incorporate changes to the District's water supply sources. Expenditures do not decline in proportion to reduced sales because a large part of expenditures are related to fixed capital costs, maintenance, and operations.

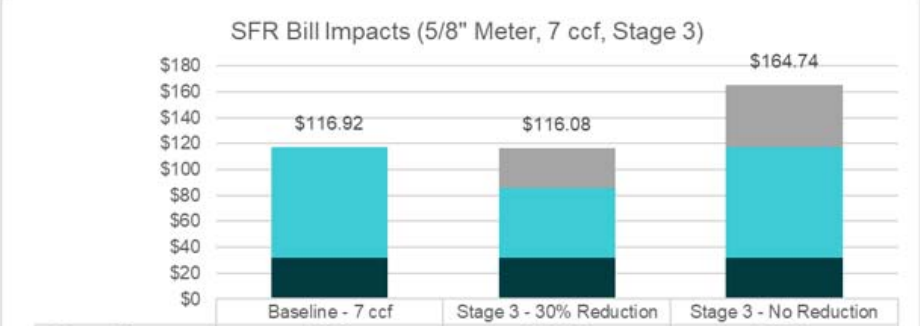
The District is proposing to amend its current Rate and Fee Schedule with water shortage contingency stage rates that correspond to the six water shortage stages. The resulting water shortage contingency stage rates (shown on page 3 of this notice) comply with Proposition 218 requirements and allow for the District to reliably recover the necessary revenue to fully fund the water system in times of requested and mandated reductions in water demand.

Based on Proposition 218 requirements, the resulting water shortage contingency stage rates are the <u>maximum</u> that the Board of Directors can implement. When officially activating the District's current Water Shortage Contingency Plan and declaring a Water Shortage stage, the Board has the discretion to implement a lower water shortage contingency stage rate, to use reserves to make up for lost revenue, defer capital projects to reduce total expenditures, or consider a combination of those three strategies to best fit the water shortage conditions.

In addition, this notification includes amending the rate schedule to allow for a pass-through of wholesale water shortage (per unit) rates and surcharges to the District's customers, if imposed by San Francisco Public Utilities Commission during a water shortage situation.

An example of the impact of water shortage contingency stage rates is shown in the table below. In this example, a typical residential customer in normal years uses 7 units per month. In Stage 3, if

Single Family Residential Customer Impact in Stage 3 of a Drought
5/8" meter 7 units per month



	Baseline - 7 ccf	Stage 3 - 30% Reduction	Stage 3 - No Reduction
Stage Charge	$0.00	$30.31	$47.82
Commodity Charge	$85.05	$53.91	$85.05
Fixed Charge	$31.87	$31.87	$31.87
Total Bill	$116.92	$116.08	$164.74

this customer reduces water consumption by the required 30%, the customer will see a very similar bill as in normal years. If the customer does not reduce consumption, then this customer would pay $47.92 additional for water service.

The Coastside County Water District Board of Directors will hold a Public Hearing at 7:00 PM on Tuesday, January 11,2022 during a regular Board of Director's meeting. The Board of Directors will consider adoption of the proposed water shortage contingency stage rates and the SFPUC pass-through wholesale water shortage rates or surcharges to be included in the Rate and Fee Schedule as of January 12, 2022 and affecting all water customers. Prior to implementing a water shortage contingency stage rate or SFPUC pass-through rates, the District will send written notification to all customers at least 30 days prior to the effective date. Interested persons are encouraged to attend and comment. This meeting will be conducted entirely by remote participation. ZOOM Meeting instructions follow below.

The basis for the water shortage contingency stage rates is described in the Water Shortage Contingency Stage Rate Study dated October 29,2021 prepared by the District's Water Rate consultant, Raftelis Financial Consultants, Inc. This study incorporates the rate model prepared by Raftelis in the Water Financial Plan and Rate Update Report dated August 5, 2020. The Water Shortage Contingency Stage Rate Study, the Water Financial Plan and Rate Update Report, the 2020 Water Shortage Contingency Plan, the Operations Budgets for FY2020-2021 and FY2021-2022, and Capital Improvement Program are available online at **www.coastsidewater.org.**

Proposition 218 allows a property owner/customer responsible for paying the water bill to respond to proposed rate increases prior to the close of the public hearing. If you wish to protest the proposed water shortage contingency stage rates, the District must receive your *written protest* prior to the close of the public hearing on Tuesday, January 11,2022 at 7:00 PM.

You may deliver the protest in advance of the public hearing by first class mail or deliver to the District's payment dropbox to: General Manager, Coastside County Water District, 766 Main Street, Half Moon Bay, CA 94019. Email protests will not be accepted. For your protest to be counted, please include one of the following: address(es) or Assessor Parcel Number(s) of the property(ies) you own, or the utility account number(s) for active utility accounts that are subject to the proposed rate adjustment(s). Protests are limited to one per parcel. If written protests are submitted by a majority of the District's property owners/customers, the proposed water shortage contingency stage rate adjustment(s) shall not be imposed.

Statute of Limitations for Challenging Proposed Rates

Pursuant to California Government Code section 53759, there is a 120-day statute of limitations for challenging the water shortage contingency stage rates and SFPUC pass-through wholesale water shortage rates set forth in this notice from the date the Board of Directors adopts the resolution approving these rates.

ZOOM Meeting Instructions: *The meeting will begin at 7:00 p.m.*

Due to the Covid-19 pandemic, and in accordance with Assembly Bill 361, which modifies California Government Code Section 54953, the Boardroom will not be open to the public for the January 11, 2022, Regular Meeting of the Board of Directors of the Coastside County Water District. This meeting will be conducted remotely via teleconference only.

The Public may watch and/or participate in the public meeting by joining the meeting through the Zoom Videoconference link provided below. The public may also join the meeting by calling the below listed teleconference phone number.

How to Join Online or by Phone

Whether you participate online or by telephone, you may wish to "arrive" early so that staff can address any technology questions prior to the start of the meeting.

ONLINE:

https://zoom.us/j/93778260596?pwd=aEpRcFlnaHdQM21PSEJQWjNiN09TQT09
Meeting ID: 937 7826 0596
Passcode: 184355
One tap mobile
+16699006833,,93778260596#,,,,,,0#,,184355# US (San Jose)

BY PHONE:
Dial by your location
+1 669 900 6833 US (San Jose)
Meeting ID: 937 7826 0596
Passcode: 184355

COASTSIDE COUNTRY WATER DISTRICT – PROPOSED AMENDMENT TO WATER RATE AND FEE SCHEDULE

WATER SHORTAGE CONTINGENCY STAGE RATES AND SFPUC PASS-THROUGH WHOLESALE WATER SHORTAGE RATES TO BE ADDED TO THE RATE AND FEE SCHEDULE ON JANUARY 12, 2021

The *Water Shortage Contingency Stage Rates* show the maximum rate levels that could be charged PER UNIT during the 6 Water Shortage Levels if the Coastside County Water District Board of Directors activate the Water Shortage Contingency Plan. The decision to implement *Water Shortage Contingency Stage Rates* is discretionary by the District's Board of Directors. Water Shortage Contingency Stage Rates and the SFPUC Pass-Through Wholesale Water Shortage Rates or Surcharges could be implemented upon 30 day written notice to all customers prior to the effective date during water shortage situations including drought, natural disasters and other water supply interruptions.

WATER SHORTAGE CONTINGENCY STAGE RATES - QUANTITY CHARGE (Monthly Rates)

Table 1A shows the proposed incremental **Water Shortage Contingency Quantity Charge** per UNIT* by Water Shortage level.
Table 1B shows the combined **Baseline Quantity Charge** (rates in effect January 1, 2022) **plus the Water Shortage Contingency Quantity Charge** per UNIT by Water Shortage level.

Table 1A: Water Shortage Contingency Quantity Charge by Water Shortage Level:

Customer Type		Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Residential							
Tier 1	1 – 4 units	$2.24	$4.01	$5.70	$7.96	$12.09	$24.04
Tier 2	5 – 8 units	$3.27	$5.87	$8.34	$11.64	$17.68	$35.15
Tier 3	9+ units	$3.95	$7.09	$10.09	$14.08	$21.38	$42.52
Multi-Family		$2.98	$5.35	$7.60	$10.61	$16.11	$32.05
Non-Residential		$3.17	$5.70	$8.10	$11.31	$17.17	$34.16

Note: 1 Unit = 1 hcf (hundred cubic feet) = 748 gallons

Table 1B: Baseline Quantity Charge* + Water Shortage Contingency Quantity Charge by Water Shortage Level:

Customer Type		Baseline*	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Residential								
Tier 1	1 – 4 units	$10.14	$12.38	$14.15	$15.84	$18.10	$22.23	$34.18
Tier 2	5 – 8 units	$14.83	$18.10	$20.70	$23.17	$26.47	$32.51	$49.98
Tier 3	9+ units	$17.94	$21.89	$25.03	$28.03	$32.02	$39.32	$60.46
Multi-Family		$13.52	$16.50	$18.87	$21.12	$24.13	$29.63	$45.57
Non-Residential		$14.41	$17.58	$20.11	$22.51	$25.72	$31.58	$48.57

**** Baseline - Quantity Charge effective 1/1/2022***

Table 2: Description of Water Shortage Levels by Stage:

Stage 1	Up to 10%	Water Shortage Advisory
Stage 2	Up to 20%	Water Shortage Emergency Warning
Stage 3	Up to 30%	Water Shortage Emergency
Stage 4	Up to 40%	Water Shortage Severe Emergency
Stage 5	Up to 50%	Water Shortage Extreme Emergency
Stage 6	Up to 60%	Water Shortage Catastrophic (Extraordinary) Emergency

SFPUC Pass-Through Wholesale Water Shortage Rates: If SPUC implements an additional unit wholesale charge to the cost of water as a result of a water shortage, the District may pass through this per unit wholesale charge to their customers based on the percentage of the District's total water supply purchased from SFPUC. The District's only other source of water is local surface and groundwater which does not require any additional water supply costs to obtain. Therefore, the proportion of the pass-through charge will be a direct proportion of how much SFPUC water is purchased to meet demand versus how much water is local sourced. The equation below shows an example of how the SFPUC per unit wholesale charge related to a water shortage will be passed through when SFPUC is charging an additional $0.50 per unit of water (hcf) and the District is purchasing 90% of its water from SFPUC and using 10% local water sources to meet the rest of demand.

*$0.50 per hcf SFPUC additional cost * 90% SFPUC water purchases = $0.45 pass-through charge to commodity rates*

Pass-through wholesale water shortage rates or surcharges would cease at the end of the water shortage situation.

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Report Date: **November 5, 2021**

Subject: **Consider Approval of Resolution 2021-08 Declaring Intention to Reimburse Expenditures From the Proceeds of Tax-Exempt Obligations**

Recommendation:

Approve Resolution 2021-08 Declaring Intention to Reimburse Expenditures from the Proceeds of Tax-Exempt Obligations.

Background:

District staff has started discussions with potential lenders/financial advisors on obtaining financing for the Nunes Water Treatment Plant Upgrades Project.

Since the Nunes Water Treatment Plant Upgrades Project is already under construction, District staff has been advised to pass a resolution that will enable the District to set a look back date of when costs cans can be reimbursed on the project from debt proceeds.

Given rules surrounding public debt obligations, the following cost can be reimbursed:

1) Soft costs (i.e. design and engineering) incurred prior to debt issuance are always reimbursable.
2) Hard costs (i.e., construction and equipment) can be reimbursed for monies spent 60 days prior to the resolutions being adopted.

Although it's likely to take many months before financing is obtained, by passing this resolution, the District will be able to apply for reimbursement of construction costs going back 60 days, or September 9, 2021.

The attached resolution template was provided by the Bond Counsel who assisted the District in 2018 with the refunding the 2006 Bond Obligation.

RESOLUTION NO. 2021-08

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE COASTSIDE COUNTY WATER DISTRICT DECLARING INTENTION TO REIMBURSE EXPENDITURES FROM THE PROCEEDS OF TAX-EXEMPT OBLIGATIONS

WHEREAS, the Coastside County Water District (the "District") owns and operates a system for the supply, treatment and distribution of water within the service area of the District (the "Water System"); and

WHEREAS, the District proposes to undertake the Project (referenced below), to issue, or cause the issuance of, debt for the Project and to use a portion of the proceeds of such debt to reimburse expenditures made for the Project prior to the issuance of the debt; and

WHEREAS, United States Income Tax Regulations section 1.150-2 provides generally that proceeds of tax-exempt debt are not deemed to be expended when such proceeds are used for reimbursement of expenditures made prior to the date of issuance of such debt unless certain procedures are followed, one of which is a requirement that (with certain exceptions), prior to the payment of any such expenditure, the issuer declare an intention to reimburse such expenditure; and

WHEREAS, it is in the public interest and for the public benefit that the District declares its official intent to reimburse the expenditures referenced herein.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Coastside County Water District as follows:

Section 1. The Board finds and determines that the forgoing recitals are true and correct.

Section 2. The District intends to issue or incur long-term obligations (the "Obligations") for the purpose of financing some or all of the costs of the acquisition and/or construction of the Nunes Water Treatment Plant Upgrades Project and incidental expenses related thereto (collectively, the "Project").

Section 3. The District hereby declares that it reasonably expects to pay certain costs of the Project prior to the date of issuance of the Obligations and to use a portion of the proceeds of the Obligations for reimbursement of expenditures for the Project that are paid before the date of issuance of the Obligations. This resolution does not bind the District to make any expenditure of Project costs or to incur any debt for the Project costs.

Section 4. The maximum principal amount of the Obligations to be issued or incurred for the Project is currently estimated to be $6,000,000.

Section 5. Effective Date: This Resolution shall take effect immediately upon its passage and adoption.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Coastside County Water District held on this 9th day of November, 2021 by the following vote:

AYES:

NOES:

ABSENT:

_____
Glenn Reynolds, President
Board of Directors

Attest:

_____
Mary Rogren, General Manager
Secretary of the Board of Directors

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Date: **November 3, 2021**

Subject: **Award of Contract for Installation of Energy Efficient LED Light Fixtures at Crystal Spring Pump Station, Nunes and Denniston Facilities using PG&E On-Bill Financing**

Recommendation:
Authorize the General Manager to enter into a contractual agreement with American Wholesale Lighting and Pacific Gas and Electric for $47,890.82 to replace 175 Compact Florescent Light (CFL) fixtures located at Crystal Springs Pump Station, Nunes, Denniston Pump Station and Water Treatment Plant with energy efficient LED fixtures. The project costs will be paid for with On Bill Financing (OBF) at 0% interest by PG&E and paid back with the net monthly electrical savings.

Background: There are 175 CFL light fixtures at the Nunes, CSP, and Denniston facilities that are inefficient and troublesome for staff to replace bulbs. Spent CFL tube are require special handling and disposal. Staff solicited bids from four PG&E qualified electrical contractors. Two companies were responsive with AWL being the lowest bidder with the fastest estimated payoff period of 2.6 years. Following the payback period, estimated annual savings on the PG&E bills for these facilities is ~$17,600. See Attachment A.

Fiscal Impact:
Funding for this project will be paid for with PG&E OBF at 0% interest in the amount of $47,891.

AMERICAN WHOLESALE LIGHTING

Energy Efficiency Proposal

Prepared for

Coastside Water District - Opt 1

766 Main St
Half Moon Bay CA 94019

Implementation Expense

Project Cost*	$	47,890.82
Rebate	$	-
Net Project Cost	$	47,890.82
ROI (yrs)		2.6

Job Details

Quantity of Fixtures Surveyed			175
Quantity of Recommended Modifications			175
Current Lighting Energy Consumption: kWH			105,926.21
Current Lighting Energy Cost:	$ 0.26 per kWh	$	27,540.81
Current Lighting Load: kW			15.19
Proposed Energy Consumption: kWH			38,174.59
Proposed Lighting Energy Cost:	$ 0.26 per kWh	$	9,925.39
Proposed Lighting Load: kW			5.24

*Project Cost incorporates Prevailing Wage, taxes, and all applicable lift charges

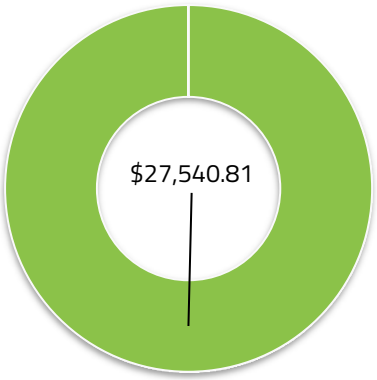
Consultant:
Brandon Fox
(510) 432-6023

AMERICAN WHOLESALE LIGHTING

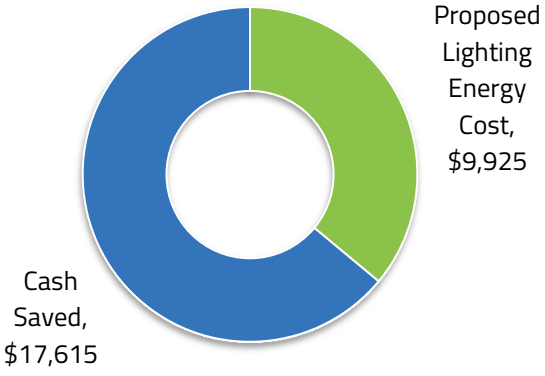
Energy Savings Analyses

Annual Energy Savings: kWh	67,752
Estimated Annual Savings	
Lighting Energy Savings	$ 17,615.42
Air Conditioning Savings*	$ -
Maintenance Savings*	$ 872.31
Total Annual Savings	$ 18,487.73
Total Monthly Savings	$ 1,540.64
Energy Avoidance Percentage	63.96%

Current Lighting Energy Cost:



Utility Bill After Retrofit:



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	Existing Fixtures				Proposed Energy Efficient Solution				Annual Savings				
	Area Description	QTY	Fixture Description	AHO	Watts Fixture	Count	Measure Description	Watts Fixture	AHO	Annual Savings KWh	Annual Savings $$$	Annual Savings KW	Existing KW	Proposed KW
1	1001 - Interior - Pump room	19	2 Lamp F48 T12 3.83' 48 Watt	8760	80	19	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 40W, 4000K, 4938 lm, Frosted Lens	40	8760	6657.6	$ 1,730.98	0.76	1.52	0.76
2	1001 - Interior - Office	2	2 Lamp F32 T8 4' 32 Watt	4368	59	2	WR3 LED Wrap Light, 1-10V dimming, 4ft, 22W, 4000K, 2970 lm, 100-277VAC, Frosted PC Lens	22	4368	323.232	$ 84.04	0.07	0.12	0.04
3	1001 - Interior - Restroom	1	1 Lamp 40 Watt Incandescent	4368	40	1	TCP LED 9.5W A19 DIM OMNI 41K WET	9.5	4368	133.224	$ 34.64	0.03	0.04	0.01
4	1001 - Exterior - Building	2	150 Watt Metal Halide	4368	184	2	G3 LED Wall Pack, W/ Photocell, Glass Refractor, 1-10V dimming, 40W, 5000K, 5120 lm, 100-277VAC	28	4368	1362.816	$ 354.33	0.31	0.37	0.06
5	150 - Interior - TWPS Pump room	6	Existing LED	4368	0	6	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
6	150 - Interior - RW pump station	6	2 Lamp F32 T8 4' 32 Watt	4368	59	6	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	4368	917.28	$ 238.49	0.21	0.35	0.14
7	150 - Interior - Storage shed	1	2 Lamp F32 T8 4' 32 Watt	4368	59	1	WR3 LED Wrap Light, 1-10V dimming, 4ft, 22W, 4000K, 2970 lm, 100-277VAC, Frosted PC Lens	22	4368	161.616	$ 42.02	0.04	0.06	0.02
8	150 - Interior - WTP	19	2 Lamp F32 T8 4' 32 Watt	4368	59	19	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	4368	2904.72	$ 755.23	0.67	1.12	0.46
9	150 - Interior - WTP restroom	1	2-Lamp 9.5W LED	4368	19	1	Install 2 TCP LED 9.5W A19 DIM OMNI 41K WET	19	4368	0	$ -	0.00	0.02	0.02
10	150 - Interior - WTP office	6	2 Lamp F32 T8 4' 32 Watt	4368	59	6	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	4368	917.28	$ 238.49	0.21	0.35	0.14
11	150 - Interior - Hypo room	4	2 Lamp F32 T8 4' 32 Watt	4368	59	4	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	4368	611.52	$ 159.00	0.14	0.24	0.10
12	150 - Exterior - Building	4	Existing LED	4368	0	4	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
13	150 - Exterior - Building	1	Existing LED	4368	0	1	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
14	150 - Exterior - Building	2	1000 Watt Metal Halide	4368	1077	2	ECO LED Flood Light, 1-10V dimming, 300W, 5000K, 40974 lm, 100-240/277VAC + U bracket	300	4368	6787.872	$ 1,764.85	1.55	2.15	0.60
15	150 - Exterior - WWR basin	5	1L 42W Compact Fluorescent	4368	42	5	TCP PL Universal 3U Non-Dimmable Lamp, 16W, 1700Lumens, 5000K + Ballast	16	4368	567.84	$ 147.64	0.13	0.21	0.08
16	500 - Interior - Entry way/ Onsite generation room	7	2 Lamp F32 T8 4' 32 Watt	8760	59	7	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	8760	2146.2	$ 558.01	0.25	0.41	0.17
17	500 - Interior - Entryway walkway	2	2 Lamp F32 T8 4' 32 Watt	8760	59	2	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	8760	613.2	$ 159.43	0.07	0.12	0.05
18	500 - Interior - Restroom	1	2 Lamp F20 T12 2' 20 Watt	8760	51	1	Install 2 - F017T8 8.5W LED Lamps (DOUBLE-ENDED BYPASS) - White Ballast Cover - 4.25 or 5"	17	8760	297.84	$ 77.44	0.03	0.05	0.02
19	500 - Interior - Operations office	11	4 Lamp F32 T8 4' 32 Watt	8760	112	11	DUO LED Back Lit Panel, 2x4, CCT& Power Switchable, 3500K/4000K/5000K, 30W/35W/40W, 100-277VAC + Surface Mount Kit	40	8760	6937.92	$ 1,803.86	0.79	1.23	0.44
20	500 - Interior - Operations office	8	2 Lamp F32 T8 4' 32 Watt	8760	59	8	DUO LED Back Lit Panel, 2x4, CCT& Power Switchable, 3500K/4000K/5000K, 30W/35W/40W, 100-277VAC + Surface Mount Kit	30	8760	2032.32	$ 528.40	0.23	0.47	0.24
21	500 - Interior - Library room	2	1-Lamp 9.5W LED	8760	9.5	2	TCP LED 14W A21 UNV ND 50K	14	8760	-78.84	$ (20.50)	-0.01	0.02	0.03
22	500 - Interior - Filter gallery	4	400 Watt Metal Halide	8760	456	4	G3 Helix LED Highbay, 0-10V dimming, 150W, 5000K, 21957 lm, 100-240/277VAC, Clear Lens, Black Housing + 60D Aluminum Shroud & Pendant Mount	150	8760	10722.24	$ 2,787.78	1.22	1.82	0.60
23	500 - Interior - Filter gallery	10	2 Lamp F48 T12 3.83' 48 Watt	8760	80	10	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 40W, 4000K, 4938 lm, Frosted Lens	40	8760	3504	$ 911.04	0.40	0.80	0.40
24	500 - Interior - Filter gallery	1	2 Lamp F48 T12 3.83' 48 Watt	8760	80	1	LED Linear Strip, 1-10V dimming, 4ft, 40W, 4000K, 5200 lm, 100-277VAC, Frosted PC Lens	40	8760	350.4	$ 91.10	0.04	0.08	0.04
25	500 - Interior - Chemical rm	12	2 Lamp F32 T8 4' 32 Watt	8760	59	12	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	8760	3679.2	$ 956.59	0.42	0.71	0.29
26	500 - Interior - Generator room	7	2 Lamp F48 T12 3.83' 48 Watt	8760	80	7	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 40W, 4000K, 4938 lm, Frosted Lens	40	8760	2452.8	$ 637.73	0.28	0.56	0.28
27	500 - Interior - WWR room	7	2 Lamp F32 T8 4' 32 Watt	8760	59	7	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	8760	2146.2	$ 558.01	0.25	0.41	0.17

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AMERICAN WHOLESALE LIGHTING

	Existing Fixtures				Proposed Energy Efficient Solution				Annual Savings					
	Area Description	QTY	Fixture Description	AHO	Watts Fixture	Count	Measure Description	Watts Fixture	AHO	Annual Savings KWh	Annual Savings $$$	Annual Savings KW	Existing KW	Proposed KW
28	500 - Interior - WWR room	10	2 Lamp F48 T12 3.83' 48 Watt	8760	80	10	Excluded from Scope	0	8760	7008	$ 1,822.08	0.80	0.80	0.00
29	500 - Interior - Storage shed	4	2 Lamp F32 T8 4' 32 Watt	4368	59	4	LED Vapor Proof Fixture, 1-10V dimming, 4ft, 24W, 4000K, 3255 lm, Frosted Lens	24	4368	611.52	$ 159.00	0.14	0.24	0.10
30	500 - Exterior - Roof	2	400 Watt Metal Halide	4368	456	2	Excluded from Scope	0	4368	3983.616	$ 1,035.74	0.91	0.91	0.00
31	500 - Exterior - Roof	3	Existing LED	4368	0	3	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
32	500 - Exterior - Roof	4	Existing LED	4368	0	4	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
33	500 - Exterior - Building	1	Existing LED	4368	0	1	Excluded from Scope	0	4368	0	$ -	0.00	0.00	0.00
34														
35														
36														
37														
38														
39														
40														
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
	Totals:	175				175				67,752	$ 17,615.42	9.95	15.19	5.24

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AMERICAN WHOLESALE LIGHTING

American Wholesale Lighting : Terms and Conditions

This Electrical Services Agreement by and between American Wholesale Lighting, Inc. a California corporation with offices located at 1725 Rutan Drive Livermore, CA 94551 (hereafter 'AWL') and Coastside Water District - Opt 1

AWL desires to provide Electrical and Lighting Services to Customer and Customer desires to obtain such services from AWL through representation of Sales Rep, an independent consultant (hereafter 'Consultant'). Customer declares that it has full authority through ownership or authorization from property manager or building owner to enter into this agreement for said property.

THEREFORE, in consideration of the mutual promises set forth below, the parties agree as follows:

DESCRIPTION OF SERVICES

AWL will provide to Customer Electrical and Lighting Services as described in this proposal at the property.

SCOPE OF WORK

AWL shall provide all labor and materials, and perform all work necessary for the completion of the Electrical and Lighting Services as described in this proposal. Electrical and Lighting services set forth only include labor and material for types and quantities listed on proposal. Additional quantities or types required will be addressed in an authorized change order. Plus any emergency ballast installations as described below.

EMERGENCY BALLAST REQUIREMENTS

The retrofitting of an area of fixtures from T12 to T8 (or Fluorescent to LED) is likely to impose a compatibility with an existing emergency battery backup system which may or may not exist within the existing fluorescent lighting system as these are ballast type specific. These fixtures are often designated by a red light viewable from the exterior of the fixture. If this red light is hidden or it was improperly installed there is no way to know if a fixture contains an emergency ballast until the fixture is opened up completely exposing such a scenario. As this is a common finding in retrofitting the Customer agrees that AWL will charge an additional fee of $140 (material cost of $85 and a labor cost of $55) per emergency ballast upgrade required to upgrade such a fixture as deemed necessary by the technician on site at the time of installation. If the additional $140.00 charge is not acceptable, fixtures with emergency ballasts will be removed from the scope or work and the overall cost of the job will be reduced accordingly

Customer Initials: X _____

PROPOSALS AND CHANGE ORDERS

The proposal is created from specifications, drawings and quantities provided by Consultant. AWL is not liable for any promises or specifications regarding light output or energy savings given this party. AWL's sole liability shall be to the quantities and types of materials and labor specified in this proposal. Project shall be considered complete and billable once the labor and materials as described this proposal have been installed as described.

On occasion the information provided in this proposal does not properly represent the materials or labor to be performed at the property. When such information comes to AWL's attention and work cannot proceed as otherwise described, the portion of the project affected will cease until such time that a Change Order with the correct items can be presented to the client and whatever additional costs, if any, are approved. If the changes are not approved the portion not affected shall not be excluded from the contract and once completed shall be billed at a prorated fee based upon the entire scope of work.

AMERICAN WHOLESALE LIGHTING

PAYMENT

Payment shall be made to American Wholesale Lighting, Inc. 1725 Rutan Drive Livermore, CA 94551 in the amount designated on Exhibit A pursuant to any additions or authorized Change Orders within 30 days from the Invoice Date. **Unless otherwise specified, tax is not included and the customer is responsible for the full tax due based upon the value of the materials listed.**

Customer Initials: X _____

TIME OF COMPLETION

AWL shall commence the work to be performed under this Agreement within 60 days of the signed proposal.

If any invoice is not paid when due, interest will be added to and payable on all overdue amounts at 18 percent per year, or the maximum percentage allowed under applicable laws, whichever is less. Customer shall pay all costs of collection, including without limitation, reasonable attorney fees.

In addition to any other right or remedy provided by law, if Customer fails to pay for the Services when due, AWL has the option to treat such failure to pay as a material breach of this Agreement, and may cancel this Agreement and/or seek legal remedies.

PERMITS

AWL shall comply with all applicable federal, state, and local laws, ordinances, regulations and codes in AWL's performance under this Agreement, including, but not limited to, the Fair Labor Standards Act, the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101 et seq.), and all safety and environmental laws. Customer shall be responsible for providing all permits (including but not limited to Title 24) for work to be completed unless otherwise stated on the Proposal. All permits provided by AWL, as requested by the customer in writing, will be reimbursed by Customer on a Time and Material basis for the both the labor required to pull the permit, and complete the required inspections as well the cost of the permit plus 15%. As of the date of this Contract permits might be required for ballast and lamp replacements by local jurisdiction.

DEBRIS

Customer shall provide a space for debris during said project. All debris resulting from said project shall be removed from premise and recycled or disposed of in accordance with applicable laws by AWL at the close of the project. AWL owns the rights to recycle all materials resulting from the completion of this project.

EXCLUDED SERVICES

Unless otherwise listed on Exhibit A or authorized in writing the following is excluded from the description of work:

(a) Additional materials or labor, whether or not recommended or directed by governmental authorities or by insurance companies

(b) Installation, service or retrofit of fixtures beyond safe reach utilizing a standard A-frame 12 foot ladder or that require the use of a hydraulic lift or scaffolding

(c) Repair or replacement of broken fixtures or lenses. Customer should be aware that old lenses can be extremely brittle and may break during the course of this project. The material cost of replacement lenses are the sole responsibility of the customer. This of course does not negate the reasonable expectation of AWL's employees to be considerate of this during scope of this project.

(d) Inaccessible fixtures. (Customer must provide access to all fixtures within this agreement. This includes but is not limited to unlocking doors, moving equipment, shelving, material, or debris.)

(e) Unsafe working area. (Customer must provide a safe working environment free from hazards. No electrical work shall be done on greasy or wet floors. Customer must make reasonable efforts to keep employees and customers from entering work area.)

AMERICAN WHOLESALE LIGHTING

INSURANCE

AWL shall maintain general liability, and workers compensation insurance at an industry standard level with a reputable insurance company.

ACCESS

The Customer will provide access to all lighting fixtures in a manner as such not to disrupt a steady workflow for the installation. Acceptable access shall be determined by the electrician lead on site at time of installation. Any fixture or areas deemed inaccessible shall be removed from the total contract at a prorated dollar amount based on the entire project

WORKING HOURS

The services required of AWL under this Contract, including emergency service, shall be performed during the regular working hours of its regular working days, consisting of 8am to 5pm, Monday - Friday except Holidays, except as provided in immediately below.

If the Customer requests that the AWL perform any of its services at times other than during its regular working hours, then for the services performed outside the regular working hours ("overtime hours"), the Customer shall be charged at one and a half times the proposed labor cost. Any differentiation must be paid in advance prior to scheduling of appointment for install.

WORK STOPPAGE

If customer prevents or stops AWL employees from completing or starting work on scheduled day of installation due to no fault of AWL or Consultant, then customer will be liable for all non-worked billable labor scheduled for that day, as required to complete Exhibit A with a maximum charge of $350 (three hundred fifty dollars) per employee scheduled.

FINAL INSPECTIONS AND LIENS

Upon notification by AWL of completion of the work, The Customer has 5 days to identify any incomplete work or deficiencies in workmanship or materials from the date of Notification of completion of work by AWL.
When the Customer finds the work is completed the Customer shall pay AWL within 30 days of the Invoice Date.
AWL as the primary Contractor for this project holds the right to file a Mechanics Lien against the property where work was performed. AWL hereby notifies customer of this right and its intent to do so if payment is not received within 30 days of completion of project.

WARRANTY

AWL shall provide its services and meet its obligations under this Agreement in a timely and workmanlike manner, using knowledge and recommendations for performing the services which meet NEC, CEC and local code requirements. AWL warrants its workmanship for a period of 1 year.
AWL shall not be held liable for any loss, any damage, or any expense in material or labor, directly or indirectly arising from the use of any material or from any other cause resulting from the purchase of and/or use of any items provided by AWL. AWL's liability is solely and expressly limited to the replacement value and/or credit for the value of the material provided by the company.
Ballast and Lamp issues, without exception, will be handled directly by the manufacturer of record for those items. AWL may at its discretion choose to intercede on behalf of said manufacturer without admission of or claiming of any responsibility for the issue resulting from the material malfunction. A contact name and phone number for a specific ballast manufacturer can be provided upon request. AWL shall provide its services and meet its obligations under this Agreement in a timely and workmanlike manner, using knowledge and recommendations for performing the services which meet NEC, CEC and local code requirements. All materials are warranted individually by their respective manufacturer.

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AMERICAN WHOLESALE LIGHTING

COMPLETION OF SERVICES

Upon the completion of the Electrical services by the AWL, AWL shall see to it that Owner's property is restored to the condition they were in prior to the entry by the AWL, and AWL shall see to it that all portions used by the AWL during the term of this Agreement shall be broom clean and free of debris.

DEFAULT

The occurrence of any of the following shall constitute a material default under this Agreement:

(a) The failure to make a required payment when due.
(b) The insolvency or bankruptcy of either party.
(c) The subjection of any of either party's property to any levy, seizure, general assignment for the benefit of creditors, application or sale for or by any creditor or government agency.
(d) The failure to make available or deliver the Services in the time and manner provided for in this Agreement.

REMEDIES

In addition to any and all other rights a party may have available according to law, if a party defaults by failing to substantially perform any provision, term or condition of this Agreement (including without limitation the failure to make a monetary payment when due), the other party may terminate the Agreement by providing written notice to the defaulting party. This notice shall describe with sufficient detail the nature of the default. The party receiving such notice shall have 30 days from the effective date of such notice to cure the default(s). Unless waived by a party providing notice, the failure to cure the default(s) within such time period shall result in the automatic termination of this Agreement.

FORCE MAJEURE

If performance of this Agreement or any obligation under this Agreement is prevented, restricted, or interfered with by causes beyond either party's reasonable control ("Force Majeure"), and if the party unable to carry out its obligations gives the other party prompt written notice of such event, then the obligations of the party invoking this provision shall be suspended to the extent necessary by such event. The term Force Majeure shall include, without limitation, acts of God, fire, explosion, vandalism, storm or other similar occurrence, orders or acts of military or civil authority, or by national emergencies, insurrections, riots, or wars, or strikes, lock-outs, work stoppages, or other labor disputes, or supplier failures. The excused party shall use reasonable efforts under the circumstances to avoid or remove such causes of non-performance and shall proceed to perform with reasonable dispatch whenever such causes are removed or ceased. An act or omission shall be deemed within the reasonable control of a party if committed, omitted, or caused by such party, or its employees, officers, agents, or affiliates

ARBITRATION

Any controversies or disputes arising out of or relating to this Agreement shall be resolved by binding arbitration in accordance with the then-current Commercial Arbitration Rules of the American Arbitration Association. The parties shall select a mutually acceptable arbitrator knowledgeable about issues relating to the subject matter of this Agreement. In the event the parties are unable to agree to such a selection, each party will select an arbitrator and the two arbitrators in turn shall select a third arbitrator, all three of whom shall preside jointly over the matter. The arbitration shall take place at a location that is reasonably centrally located between the parties, or otherwise mutually agreed upon by the parties. All documents, materials, and information in the possession of each party that are in any way relevant to the dispute shall be made available to the other party for review and copying no later than 30 days after the notice of arbitration is served. The arbitrator(s) shall not have the authority to modify any provision of this Agreement or to award punitive damages. The arbitrator(s) shall have the power to issue mandatory orders and restraint orders in connection with the arbitration. The decision rendered by the arbitrator(s) shall be final and binding on the parties, and judgment may be entered in conformity with the decision in any court having jurisdiction. The agreement to arbitration shall be specifically enforceable under the prevailing arbitration law. During the continuance of any arbitration proceeding, the parties shall continue to perform their respective obligations under this Agreement.

AMERICAN WHOLESALE LIGHTING

ENTIRE AGREEMENT

This Agreement contains the entire agreement of the parties, and there are no other promises or conditions in any other agreement whether oral or written concerning the subject matter of this Agreement. This Agreement supersedes any prior written or oral agreements between the parties.

SEVERABILITY

If any provision of this Agreement will be held to be invalid or unenforceable for any reason, the remaining provisions will continue to be valid and enforceable. If a court finds that any provision of this Agreement is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision will be deemed to be written, construed, and enforced as so limited.

GOVERNING LAW

This Agreement may be modified or amended in writing, if the writing is signed by the party obligated under the amendment.

NOTICE

Any notice or communication required or permitted under this Agreement shall be sufficiently given if delivered in person or by certified mail, return receipt requested, to the address set forth in the opening paragraph or to such other address as one party may have furnished to the other in writing.

WAIVER OF CONTRACTUAL RIGHT

The failure of either party to enforce any provision of this Agreement shall not be construed as a waiver or limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.

X _____ _____

Signature Date

_____

Print Name

AMERICAN WHOLESALE LIGHTING

Customer Information

Coastside Water District - Opt 1
766 Main St
Half Moon Bay CA 94019

Contact	Darin Sturdivan
Phone	650-554-0007
Fax	-
Email	Dsturdivan@coastsidewater.org

Project Information

Proposal Date			11/3/2021
Project Cost*		$	47,890.82
Rebate		$	-
Net Project Cost	*Tax Included*	$	47,890.82
Consultant			Brandon Fox

X _____
Signature

_____
Date

_____
Print Name

X _____
American Wholesale Lighting

_____
Date

_____
Print Name

*Project Cost incorporates Prevailing Wage, taxes, and all applicable lift charges

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **James Derbin, Superintendent of Operations**

Agenda: **November 9, 2021**

Date: **November 3, 2021**

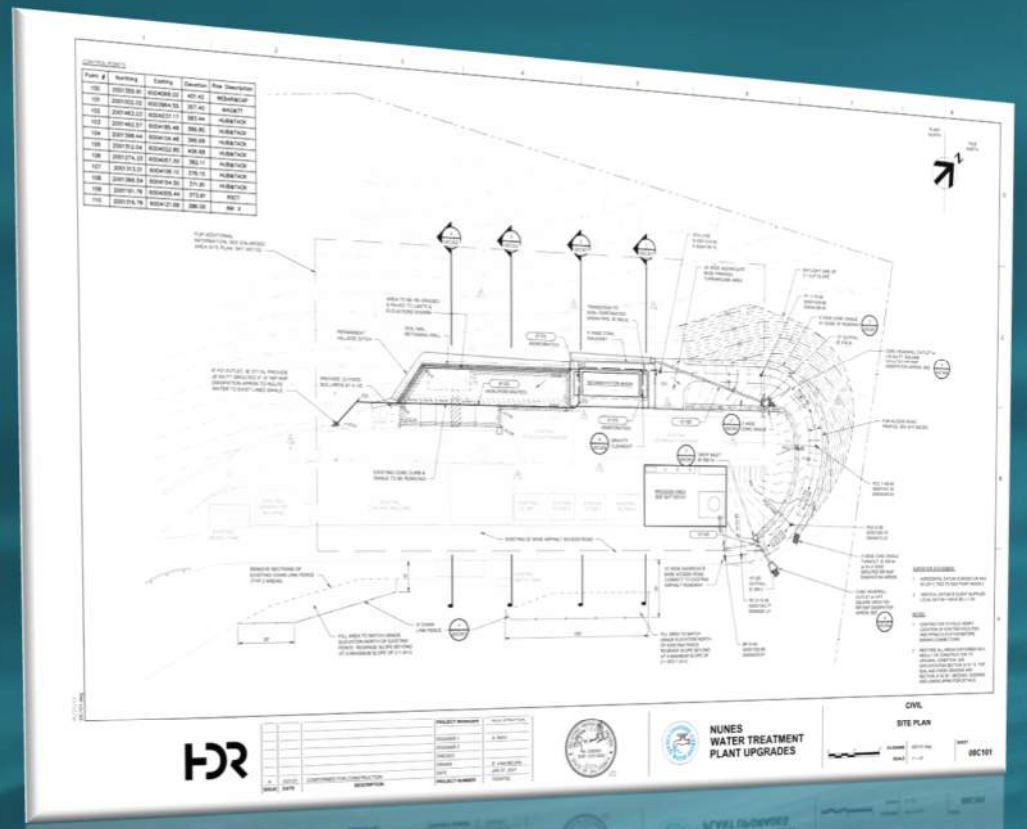
Subject: **Nunes Water Treatment Plant Upgrades Project Update #3**

Informational Item

The Nunes Water Treatment Plant Upgrade Project official contractual start date was August 16, 2021. This project update is the third of several updates staff plans to present to the Board on progress of this important project.

Freyer and Loretta, Inc., the Construction Management firm on this project has put together a brief summary of progress to date. See Attachment A.

Attachment A



COASTSIDE COUNTY WATER DISTRICT

Coastside County Water District

Nunes Water Treatment Plant Upgrades

November 9, 2021 Board Meeting

FREYER & LAURETA, INC.

Contract Data as of Board Meeting Date

Contract Time (Calendar Days)		Contract Value	
Base Contract Duration	720	Base Contract	$8,339,915.00
Approved Change Order Days Added	0	Approved Change Order Added	$0
Approved Change Order Days Subtracted	0	Approved Change Order %	0%
Total Contract Duration	720	Total Contract Approved	$8,339,915.00
Elapsed (Start Date 8/16/2021)	85	Billed to Date [1]	$791,100.00
Remaining Days	635	Remaining Value	$7,548,815.00

Construction Progress Update #3

Progress since Previous Board Meeting:

- Installation of rebar and formwork for the new sedimentation basin walls.
- Construction of replaced treatment plant wooden wall at north end of filter gallery including rotted framing.
- Ongoing Contractor Submittals, engineering reviews, ordering materials.
- Ongoing Contractor Requests for Information (RFIs) and team responses.

Construction Progress Update #3

Three-Week Look Ahead Schedule:

Major items of work anticipated over next 3-4 weeks are as follows:

- Pouring concrete for sedimentation basin walls.
- Water tightness testing of sedimentation basin concrete structure.
- Allowing concrete to cure and gain strength before backfill.
- Grading, clearing, and excavation for new caustic soda process area.
- Conduit installation, forming, rebar and concrete for process area slabs-on-grade and foundations.
- Installation of new treated water line inside filter gallery.

Overall Project Schedule:

- Anticipated completion August 2023.
- Good progress so far, but supply-chain issues seem to be getting worse. Overall project schedule will be assessed once dates from suppliers are received over the next two months.

Construction Photos

STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **Mary Rogren, General Manager**

Agenda: **November 9, 2021**

Report Date: **November 5, 2021**

Subject: **General Manager's Report**

Recommendation:
Information Only.

BAWSCA' s Refunding Bond Sale

In October 2021, BAWSCA completed its refunding bond sale in order to refund the callable portion of the 2013A bonds.

The terms of the new Series 2023A bonds are as follows:

- Term of bonds: Through 2034
- Estimated Net Present Value (NPV) savings (after costs): $25.1 M
  - Average annual savings: $2.4 M after bond settlement
  - To be reflect in BAWSCA bond surcharges (*on monthly SFPUC wholesale water bills*) starting FY 2022-23
- Total principal amount: $134.310 M
  - All-in true interest rate: 2.06%
  - Settlement date: January 5, 2023

Special Meeting of the Board of Directors held October 28, 2021

On October, 28, 2021, Robert Schultz, Principal Hydrogeologist with Geo Blue Consulting, conducted a Strategic Planning Session with the Board focusing in on reviewing local water source alternatives.

Mr. Schultz's slide presentation is included with the Special Meeting Agenda Packet on the District's website www.coastsidewater.org.

In upcoming months, Staff will report on progress in reviewing possible local source opportunities. Staff's near-term focus is rehabilitating existing wells in order to maximize use during the winter months.

MONTHLY REPORT

To: **Mary Rogren, General Manager**

From: **James Derbin, Superintendent of Operations**

Agenda: **November 9, 2021**

Report Date: **November 2, 2021**

Monthly Highlights

- New Maintenance Worker started
- Lead and Copper customer results letters mailed
- Denniston Dredging
- Denniston started up on 10/28/21. Running at 400gpm
- Hydrants changed out at: 147, 207 and 506 El Granada Blvd.
- Late October power outage storm response:
    - Sunday 10/24/21, 3pm power out at CSP. HMB tanks full.
    - Monday 10/25/21 staff called SFPUC and requested emergency Pilarcitos Lake water @ 1,000gpm

Sources of Supply

- **October Sources:**
    - Crystal Springs, Pilarcitos Lake, Denniston Reservoir and Wells

Projects

- Andreini nearing completion on hardscape project at Main Street
- CalOES PSPS Grant - Blue1 Energy has confirmed new fuel tank will ship early November 2021. Permitting will be complete in November and construction likely scheduled in December/January.
- Nunes Water Treatment Plant Improvement Project - Ranger mobilized on 8/16/21.
    - Sedimentation basin excavation complete. Footing and floor of basin poured. Basin walls scheduled to pour 9/10/21.
- EKI
    - Grandview/Hwy 1 crossing design, 100% complete. Cal Trans Encroachment Permit (EP) arrived, applying for EP with the City of HMB
    - Pilarcitos Crossing – Design complete, ISMND
    - Purrisima Way- Design started
    - Miramontes Point Road – Design started
- HDR

- Half Moon Bay Tank replacement project – HDR has started design to replace HMB tanks 1&2 first. BDR expected in December.