DRAFT ENVIRONMENTAL IMPACT REPORT

Newell Creek Pipeline Improvement Project

Prepared for

City of Santa Cruz Water Department
212 Locust Street, Suite C • Santa Cruz, CA 95060

NOVEMBER 2021

CITY OF SANTA CRUZ Water Department

Our Water, Our Future



Prepared by
DUDEK
725 Front Street, Suite 400
Santa Cruz, CA 95060

SCH NO. 2021010166
Contact: Danny DeBrito

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
3CE	Central Coast Community Energy
AAQS	ambient air quality standards
AB	Assembly Bill
Air Basin	North Central Coast Air Basin
AMBAG	Association of Monterey Bay Area Governments
amsl	above mean sea level
APE	area of potential effect
AQMP	air quality management plan
ASHCP	Anadromous Salmonid Habitat Conservation Plan
ASR	aquifer storage and recovery
AST	above-ground storage tank
Basin Plan	*Water Quality Control Plan for the Central Coastal Basin*
BMPs	best management practices
BRA	Biological Resources Assessment
BSA	Biological study area
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
CAP	climate action plan
CARB	California Air Resources Board
CCE	Community Choice Energy
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	chlorofluorocarbon
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Resources Information System
CIP	Capital Improvement Program
City	City of Santa Cruz Water Department
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CNRA	California Natural Resources Agency
CO	carbon monoxide

Acronym/Abbreviation	Definition
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
County	County of Santa Cruz
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agency
dB	decibels
dBA	A-weighted decibels
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EIA	U.S. Energy Information Administration
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EV	electric vehicle
FBPS	Felton Booster Pump Station
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FPVC	Fusible polyvinyl chloride
g	percent of gravity
GHG	greenhouse gas
GIS	geographic information system
GHWTP	Graham Hill Water Treatment Plan
GWP	global warming potential
HA	hydrologic area
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HCP	Habitat Conservation Plan
HDD	Horizontal directional drilling
HDPE	high-density polyethylene pipeline
HFC	hydrofluorocarbon
HMBP	Hazardous Material Business Plan
HMMP	Hazardous Materials Management Plan
HSA	hydrologic subarea
HU	hydrologic unit
HUC	hydrologic unit code
Hz	Hertz
in/sec	inches per second
IPaC	Inventory for Planning and Conservation
IPCC	Intergovernmental Panel on Climate Change
ISTEA	Intermodal Surface Transportation Efficiency Act
kWh	kilowatt hours
LACM	Natural History Museum of Los Angeles County

Acronym/Abbreviation	Definition
L_{eq}	equivalent noise level
L_{dn}	day-night average noise level
L_{max}	maximum noise level
L_{min}	minimum noise level
LOS	level of service
LUST	leaking underground storage tank
MBARD	Monterey Bay Air Resources District
MBCP	Monterey Bay Community Power
MBTA	Migratory Bird Treaty Act
MT	metric tons
MMT	million metric tons
mpg	miles per gallon
MPN	most probable number
MPO	metropolitan planning organization
MT	metric ton
MT CO_2e	metric tons of carbon dioxide equivalent
MTIP	Metropolitan Transportation Improvement Plan
Mw	moment magnitude
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCP	Newell Creek Pipeline
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTU	nephelometric turbidity units
NWIC	Northwest Information Center
O_3	ozone
O&M	Operations and maintenance
OPR	California Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PCE	Passenger Car Equivalent
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	fine particulate matter
PM_{10}	coarse particulate matter
ppm	parts per million
PPV	Peak particle velocity
PRC	California Public Resources Code
Proposed Project	Newell Creek Pipeline Replacement Project
PVC	polyvinyl chloride

Acronym/Abbreviation	Definition
RCRA	Resource Conservation and Recovery Act
RFS	Renewable Fuel Standard
RMS	root mean square
ROG	reactive organic gas
ROW	Right-of-way
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill
SCCHRI	Santa Cruz County Historic Resources Inventory
SCCRTC	Santa Cruz County Regional Transportation Commission
SCMTD	Santa Cruz Metropolitan Transit District
SCWRP	Santa Cruz Water Rights Project
SEL	sound exposure level
SF_6	sulfur hexafluoride
SLCP	short-lived climate pollutant
SLF	Sacred Lands File
SLV	San Lorenzo Valley
SLVWD	San Lorenzo Valley Water District
SMGWA	Santa Margarita Groundwater Agency
SO_2	sulfur dioxide
SRF	State Revolving Fund
SU	Special Use
SVP	Society of Vertebrate Paleontology
SVWD	Scotts Valley Water District
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TMDL	total maximum daily load
UCSC	University of California, Santa Cruz
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	vibration decibels
VMT	vehicle miles traveled
VOC	volatile organic compound
WIFIA	Water Infrastructure Finance and Innovation Act

1 Summary

1.1 Introduction

This environmental impact report (EIR) evaluates the potential for significant environmental impacts from the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). This summary highlights the major areas of importance in the environmental analysis for the Proposed Project, as required by Section 15123 of the California Environmental Quality Act (CEQA) Guidelines. It also provides a brief description of the Proposed Project, alternatives to the Proposed Project, and areas of controversy known to the City of Santa Cruz (City). In addition, this chapter provides a table summarizing: (1) the potential environmental impacts that would occur as the result of the Proposed Project; (2) the level of impact significance before mitigation; (3) the proposed mitigation measures that would avoid or reduce significant environmental impacts; and (4) the level of impact significance after mitigation measures are implemented.

1.2 Project Overview

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch ductile iron or polyvinyl chloride (PVC) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), which includes road pavement and unpaved shoulders adjacent to the paved road, and/or existing City easements. In order to focus the environmental review on specific locations along the 8.75-mile pipeline, the alignment was separated into a northern segment and a southern segment; these segments were further delineated into specific sections as described below.

The proposed northern NCP segment from the Newell Creek Access Road Bridge just south of Newell Creek Dam to the Felton Booster Pump Station (FBPS) generally follows the existing NCP alignment. There are six distinct sections that comprise the northern segment, generally named for the roads in proximity to the pipe or other notable features nearby: Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, San Lorenzo Way, and Felton Booster Pump Station.

The proposed southern NCP segment from the FBPS to the Graham Hill Water Treatment Plant (GHWTP) generally includes a new pipeline alignment along Graham Hill Road, except where it already exists in Graham Hill Road between the southern edge of Henry Cowell State Park and the GHWTP. The new pipe would replace the existing pipe that is located within Pipeline Road in Henry Cowell Redwoods State Park. The southern segment is comprised of two sections, Graham Hill Road North and Graham Hill Road South.

Other components of the Proposed Project include cathodic protection and installation and/or replacement of minor appurtenances, such as air release valves and isolation valves. Once the new pipeline is installed and the interconnections are made, the existing NCP generally would be abandoned in place.

Three pipeline sections have been identified for replacement in the near term: two sections along Graham Hill Road, comprising the entire southern segment that would replace the existing pipe through Henry Cowell Redwoods State Park in a new alignment, and the Brackney North section in the northern segment. The engineering design phase for these sections is underway. For the remainder of the pipeline alignment, a

conservative project scenario is assumed, which includes installation of the new pipeline within specified construction disturbance corridors.

Standard construction practices would be implemented by the City or its contractors during construction of the Proposed Project to avoid or minimize erosion and water quality degradation, protect sensitive species and habitat, reduce potential impacts to cultural resources, and reduce air quality and noise impacts. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements.

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately late 2022/early 2023 to 2032. The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first, with an estimated construction schedule of about 24 months for the Graham Hill Road sections and approximately 9 months for the Brackney North section, including pipeline installation, road repaving, abandonment of the existing NCP, and post-construction revegetation where needed. The remainder of the pipeline sections are expected to be constructed by 2032.

A full description of all project components is provided in Chapter 3, Project Description, of this EIR.

1.3 Impact Summary

Table 1- on page 1-5 below provides a complete list of the Proposed Project's environmental impacts, including the level of significance before and after mitigation, based on the analysis and conclusions presented in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. Significant and unavoidable impacts have been identified in this EIR related to temporary construction noise associated with pipe installation as listed in Table 1- (see Impact NOI-2). For information regarding how the alternatives to the Proposed Project, as identified in Section 1.4, Alternatives to the Proposed Project, would address these same environmental impacts, see Table 6-3 in Chapter 6, Alternatives.

1.4 Alternatives to the Proposed Project

CEQA Guidelines Section 15126.6 requires that an EIR describe and evaluate alternatives to the Proposed Project that feasibly attain most of the basic objectives of the project and would avoid or substantially lessen any of the significant effects of the project. As most identified impacts of the Proposed Project relate to the actual construction of various project and programmatic infrastructure components, the alternatives selected consider no or reduced infrastructure components. The following alternatives are evaluated in Chapter 6, Alternatives:

- **No Project Alternative** – The No Project Alternative is required by CEQA and consists of the circumstances under which the Proposed Project does not proceed
- **Alternative 1A** – Alternative Pipe Alignment: Quail Hollow Road in the northern segment as shown on Figure 6-2
- **Alternative 1B** – Alternative Pipe Alignment: Mount Hermon Road in the southern segment as shown on Figure 6-2
- **Alternative 2** – Brackney North Pipe Section Alternative Construction Methods

Table 6-3 in Chapter 6, Alternatives, presents a comparison of project impacts between the Proposed Project and the alternatives. The No Project Alternative would reduce or avoid impacts to some environmental resources. Alternative 1A would avoid significant impacts related to geology (GEO-2), hazardous materials (HAZ-3), and hydrology (HYDRO-1). Other significant impacts would remain the same as with the Proposed Project, except that biological resource impacts (BIO-1A, BIO-1B, BIO-2) and paleontological resource impacts (GEO-4) could increase in severity over the Proposed Project. However, Alternative 1A would reduce impacts associated with noise impacts (NOI-2) from significant unavoidable to less than significant with mitigation. Alternative 1B would lessen significant impacts related to some biological resources (BIO-1A, BIO-3-jurisdictional wetlands) and paleontological impacts (GEO-4), but impacts would continue to be significant, requiring mitigation as with the Proposed Project. Other significant impacts would remain the same as the Proposed Project, except that some biological resource impacts (BIO-1B, BIO-2) and hazardous materials impacts (HAZ-3) could increase in severity over the Proposed Project. Alternative 2 would not avoid or substantially reduce any identified significant impacts.

Overall, of the alternatives considered, Alternative 1A would eliminate or reduce the severity of more identified significant impacts than the other alternatives reviewed and also attain most of the project objectives. Therefore, Alternative 1A is considered the environmentally superior alternative of the CEQA alternatives reviewed.

1.5 Known Areas of Controversy

The City of Santa Cruz, as the Lead Agency, has identified areas of concern based on the EIR Notice of Preparation (NOP), which is included in Appendix A. In response to the NOP, one letter of comment was received from one public agency. One public scoping meeting was held on February 2, 2021 to receive public comments on the scope of the EIR's analyses. Due to restrictions from the Covid-19 pandemic[1], a virtual public scoping meeting was held, and the corresponding presentation about the Proposed Project was posted on the City's website at http://www.cityofsantacruz.com/waterenvdocs. No comments regarding the scope of EIR analysis were received at the scoping meeting.

The written comments received in response to the NOP have been taken into consideration in the preparation of this EIR for comments that address environmental issues. The comments concern cultural resources and recommendations for cultural resources studies and outreach to Native American tribes. All substantive environmental issues raised in the comment letters received in response to the NOP have been addressed or otherwise considered during preparation of this Draft EIR. There are no areas of known controversy regarding the Proposed Project.

[1] Due to the Shelter-In-Place Order issued on March 16, 2020 by the County of Santa Cruz in response to the 2019 novel coronavirus disease (COVID-19) pandemic, the meeting was held on the phone for remote participation. Notice of this meeting, how to attend the virtual meeting, and how to access the materials online was sent to the City's mailing list in advance of the scoping meeting. This notice was posted on the City's website, the City Hall campus notice board, and on the project site, and it was sent to the same distribution list as the NOP (excluding the State Clearinghouse and the County Clerk).

1.6 Issues to be Resolved

CEQA Guidelines Section 15123 requires the EIR summary to identify "issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." This EIR has presented mitigation measures and project alternatives, and the City Council will consider the Final EIR when considering the Proposed Project. In considering whether to approve the Proposed Project, the City Council will take into consideration the environmental consequences of the Proposed Project with mitigation measures and project alternatives, as well as other factors related to feasibility. The City Council will also consider the extent to which the project alternatives, would meet the underlying purposes of the Proposed Project and whether the alternatives would meet the City's specific project objectives.

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Air Quality			
Impact AIR-1: Criteria Pollutant Emissions. The Proposed Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project would not 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.	Less than Significant	None	Less than Significant
Impact AIR-2: Exposure of Sensitive Receptors. The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	None	Less than Significant
Impact AIR-3: Result in Other Emissions (Odors) Adversely Affecting a Substantial Number of People. The Proposed Project would not result in other emissions that would adversely affect a substantial number of people.	Less than Significant	None	Less than Significant
Impact AIR-4: Cumulative Air Quality Impacts. The Proposed Project emissions, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to air quality, and the Proposed Project's contribution would not be cumulatively considerable.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Biological Resources			
Special-Status Plant Species. The Proposed Project could have a substantial adverse effect on special-status plant species during construction.	Potentially Significant	**MM BIO-1: Project Siting (Applicable to all Proposed Project sections).** The City shall protect the specific locations of any sensitive biological resources, including special-status plants, special-status wildlife, sensitive vegetation communities and habitat areas, and jurisdictional aquatic resources, that are outside of but adjacent to construction work areas to minimize disturbance to these resources. These locations shall be identified prior to construction and impacts to such resources will be avoided and minimized through placement of protective measures, such as fencing, staking and/or flagging to prevent equipment or workers from temporarily encroaching within these areas. Warning signs shall be posted on the temporary fencing to alert workers not to proceed beyond the fence, including the following language: "Notice: Sensitive Habitat Area. Do Not Enter." The specific locations of sensitive biological resources to be protected will be identified by a qualified biologist and protective measures will be installed prior to the commencement of construction. No ground disturbing activities will occur outside existing developed areas and maintained road rights-of-way (ROW) to avoid and minimize impacts to special-status plants, special-status wildlife, sensitive vegetation communities, sensitive habitats, and aquatic resources. **MM BIO-2: Special-Status Plant Surveys (Applicable to all Proposed Project sections).** To identify special-status plants or plant patches to be avoided under MM BIO-1, a qualified botanist shall survey Proposed Project work areas not covered in 2021 surveys in accordance with standard protocols (CNPS 2001, CDFW 2018, USFWS 2000) prior to construction. The botanist shall also revisit the 2021 botanical survey area to confirm the absence of special-status plants from any direct impact areas (e.g., staging areas,	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		excavation footprints) included in final construction drawings (areas outside direct impact areas that were surveyed in 2021 would not need to be rechecked). The botanist or another qualified biologist with native plant identification training shall be present on site during the placement of protective fencing, staking, and/or flagging so that plants and their root zones are adequately protected from construction activities. **MM BIO-3: Special-Status Plant Compensation.** If any special-status plant occurrences are found in future surveys and cannot be avoided, a plan focused on compensating for impacts to these species shall be developed by the City prior to construction and implemented. This plan shall be a component of the project's overall Habitat Mitigation and Monitoring Plan described in MM BIO-10 and include the following elements: a. Description and quantification of special-status plant occurrences that would be impacted by the project; b. Identification and evaluation of on- or off-site areas for preservation of existing special-status plant occurrences or propagation of new occurrences using seeds from impacted occurrences; c. Analysis of appropriate and viable planting or propagation techniques, seed-collection techniques, and seeding rates for impacted species; d. A description of specific performance standards, including a required replacement ratio and minimum success standard of 1:1 for impacted individuals or populations; e. A monitoring and reporting program to ensure mitigation success; and	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		f. A description of adaptive management and associated remedial measures to be implemented in the event that performance standards are not achieved.	
Impact BIO-1B: Special-Status Wildlife Species. The Proposed Project could have a substantial adverse effect on special-status wildlife species during construction.	Potentially Significant	**MM BIO-1** (as shown in Impact BIO-1A) and the following measures. **MM BIO-4: Sandhills Species Wildlife Protection and Compensation (Applicable to Proposed Project Newell Creek Road, Glen Arbor, Graham Hill Road North and Graham Hill Road South sections).** Direct temporary impacts to suitable Sandhills habitat for the Mount Hermon June beetle and/or Zayante band-winged grasshopper (and individuals) shall be addressed through either the Section 7 or Section 10(a)(1)(B) process under the federal Endangered Species Act (ESA) of 1973, as amended. Alternatively, the City may seek concurrence with USFWS that implementation of appropriate avoidance and minimization measures set forth in the existing O&M HCP would ensure approved levels of incidental take are not exceeded due to project activities. Compensatory mitigation for the temporary loss of suitable habitat (and individuals) shall be provided at a minimum 1:1 ratio or at other ratios as determined through consultation with USFWS. The City has available acreage at its existing Bonny Doon mitigation site which provides high quality Mount Hermon June Beetle habitat, per the Low-Effect HCP issued for GHWTP activities; this site may be utilized to compensate for any temporary impacts to Mount Hermon June Beetle resulting from the Proposed Project. Once the take authorization has been provided for the Proposed Project, if necessary, relevant conservation measures shall be implemented. **MM BIO-5: Mount Hermon June Beetle Protection (Applicable to Proposed Project Newell Creek Road, Glen Arbor, Graham Hill Road North and Graham Hill Road South sections).** To reduce potential impacts to Mount Hermon June Beetle, exposed soils disturbed in areas of Zayante soils shall be covered during the active breeding season (May 15 through August 15) between the hours of 7pm and	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		7am daily. All exposed soils shall be covered by tarps, plywood, erosion control fabric, or other suitable impervious material. This will prevent adult males from burrowing into the exposed soils and subsequently being injured or killed by soil disturbance. **MM BIO-6: Conduct Special-Status Amphibian and Reptile Species Survey and Monitoring (Applicable to Proposed Project Newell Creek Road, Glen Arbor Road, and Graham Hill Road North sections).** A pre-construction survey for Santa Cruz black salamander, California giant salamander, and western pond turtle shall be conducted within 48 hours prior to the initiation of ground disturbance in suitable habitat for these species (i.e., damp upland areas near/adjacent to existing aquatic features associated with creeks, and the wetted portion of creeks). The survey area shall include all suitable habitat within work areas, plus a 50-foot buffer. Following the survey, the contractor, under the direction of a qualified biologist, shall install wildlife exclusion fencing (WEF) along the boundary of the work area containing suitable habitat to prevent special-status amphibians and reptiles from entering the work area. WEF must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length, and must have intermittent exit points. Turn-arounds shall be installed at access points to direct amphibians and reptiles away from gaps in the fencing. A daily pre-construction sweep for wildlife within all staging and work areas shall be conducted and a qualified biologist shall inspect WEF at least weekly when work is conducted within suitable habitat. If any individuals of Santa Cruz black salamander, California giant salamander or western pond turtle are observed during the pre-construction survey or construction, their location(s) shall be recorded and they should be allowed to move out of the area on their own. Alternatively, they shall be moved to the nearest appropriate habitat outside of the work area by a qualified	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		biologist with applicable regulatory approvals to capture, handle, and translocate these species. To avoid entrapment of special-status as well as common amphibian and reptiles during construction, any trenches or pits measuring 1 foot or greater in depth that must be left open at the end of a day's construction activities shall be either covered or encircled with WEF, or the end of any open walls shall be ramped at an approximate 2:1 slope to allow any wildlife that enters the excavation to escape. A qualified biologist may approve the use of an alternative method to prevent ingress or entrapment. **MM BIO-7: Conduct San Francisco Dusky-Footed Woodrat Survey and Relocation (Applicable to Proposed Project Newell Creek Road, Brackney North, Brackney South, San Lorenzo Way, Felton Booster Pump Station, and Graham Hill Road North sections).** A pre-construction survey to locate woodrat middens shall be conducted by a qualified biologist no more than 14 days prior to the onset of construction activities. The survey area shall include all suitable habitat within the work areas, plus a 50-foot buffer. Woodrat middens found shall be photographed, mapped and flagged with high visibility flagging tape or fenced for avoidance. If middens are found and complete avoidance is not feasible, the following measures shall be implemented after obtaining approval from CDFW to avoid and reduce impacts on San Francisco dusky-footed woodrat: a. A qualified biologist shall dismantle the nest by hand to allow for adult San Francisco dusky-footed woodrat individuals to escape (this work shall be conducted outside of the breeding season for this species which is April through June);	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		b. If young are observed during the dismantling process, the qualified biologist shall stop work for a minimum of 24 hours to allow the adult woodrats to relocate their young; c. Once the nest is determined to be vacant, the dismantling process shall be completed and the nest materials shall be collected and moved to another suitable location nearby and outside of the construction footprint to allow for nest reconstruction; and d. Where feasible, piles of cut vegetation and slash generated by project clearing and grubbing activities shall be left outside of, but near the work area, to provide refuge for woodrats that may become displaced by project activities. **MM BIO-8: Conduct Preconstruction Nesting Bird Surveys (Applicable to Proposed Project Graham Hill Road North section and any section where tree or vegetation removal is proposed).** Vegetation removal activities shall be conducted outside the bird nesting season (February 1 through August 31) as much as possible to avoid direct impacts to nesting birds. For construction and vegetation removal activities occurring during the nesting season, an avian nesting survey of the work areas and contiguous habitat within 300 feet of all impact areas must be conducted for protected migratory birds and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 14 days prior to the start of vegetation removal or construction activities. Once construction has started, if there is a break in activities that exceeds 14 days, then another avian nesting survey shall be conducted. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans along with an appropriate no disturbance buffer, which will be determined by the biologist based on the species' sensitivity to disturbance. The nest area shall be avoided until the nest is vacated and the juveniles have fledged. The no disturbance	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		buffer shall be demarcated in the field with flagging and stakes or construction fencing as determined appropriate by the biologist. **MM BIO-9: Conduct Preconstruction Roosting Bat Survey (Applicable to Proposed Project Newell Creek Road, Brackney North, Brackney South, San Lorenzo Way, Felton Booster Pump Station, and Graham Hill Road North sections).** To the extent practicable, tree removal should occur outside peak bat activity timeframes when young or overwintering bats may be present, which generally occurs from March through April and August through October, to ensure protection of potentially occurring bats and their roosts within work areas. Additionally, daily restrictions on the timing of any construction activities should be limited to daylight hours to reduce disturbance to roosting (and foraging) bat species. Additionally, a visual bat survey should be conducted within 30 days prior to the removal of any trees and commencement of construction activities. The survey should include a determination on whether any active bat roosts are present on or within 50 feet of the project work areas. If a non-breeding and non-wintering bat colony is found, the individuals shall be evicted under the direction of a qualified biologist to ensure their protection and avoid unnecessary harm. If a maternity colony or overwintering colony is found within the work areas, then the qualified biologist shall establish a suitable construction-free buffer around the location. The construction-free buffer shall remain in place until the qualified biologist determines that the nursery is no longer active. **MM BIO-10: Biological Construction Monitoring (Applicable to all sections with off-pavement ground disturbance).** A qualified biologist shall monitor vegetation removal and initial ground disturbing construction activities for off-pavement work and conduct periodic monitoring inspections for all other construction activities. The monitor shall check any installed WEF (MM BIO-6) and buffers for any active	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		nesting birds (MM BIO-7) encountered at least once a week, and if nesting birds are determined to be present, shall verify when the young have fledged before commencement of construction activities in proximity to the nest. The biologist shall have stop-work authority in the event that a protected species is found within the active construction footprint. During construction, the biological monitor shall keep a daily observation log and a photo log to describe monitoring activities, remedial actions, non-compliance, and other issues and actions taken. These logs shall be kept on-site or tracked in a digital database and made available for inspection by agency personnel.	
Impact Bio-2: Sensitive Vegetation Communities. The Proposed Project could have a substantial adverse effect on sensitive vegetation communities and habitats during construction.	Potentially Significant	**MM BIO-1** (as shown in Impact BIO-1A) and the following measures. **MM-BIO-11: Sensitive Vegetation Communities Compensation (Applicable to Proposed Project Newell Creek Road, Glen Arbor Road, Graham Hill Road North, and Graham Hill Road South sections).** Direct temporary impacts to sensitive vegetation communities shall be mitigated via a combination of on-site and off-site measures. On-site measures shall include rehabilitation for areas temporarily impacted at a 1:1 mitigation ratio. All areas temporarily impacted shall be returned to conditions similar to those that existed prior to grading and/or ground-disturbing activities. It is anticipated that a one-time restoration effort at the completion of the project followed by monitoring and invasive weed removal for a minimum of 3 years would adequately compensate for the direct temporary impacts to these vegetation communities. A Habitat Mitigation and Monitoring Plan shall be prepared and implemented to compensate for the loss of all sensitive vegetation communities (see below). Rehabilitation and enhancement activities with Zayante soils will be revegetated with plants native to the Sandhills habitat (on Zayante soils), such as sticky monkeyflower (*Mimulus aurantiacus*), deer weed (*Lotus scoparius*), and silver bush lupine. These native plants	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		will provide suitable habitat conditions for special-status species that might eventually colonize the temporarily impacted portion of the impact area. These revegetated areas will not include any landscape elements that degrade habitat for the special-status species, including mulch, bark, weed matting, rock, aggregate, or turf grass. The Habitat Mitigation and Monitoring Plan shall detail the habitat restoration activities and shall specify the criteria and standards by which the revegetation and restoration actions will compensate for impacts of the Proposed Project on sensitive vegetation communities and shall at a minimum include discussion of the following: a. The rehabilitation and enhancement objectives, type, and amount of revegetation to be implemented taking into account enhanced areas where non-native invasive vegetation is removed and replanting specifications that take into account natural regeneration of native species when applicable. b. The specific methods to be employed for revegetation. c. Success criteria and monitoring requirements to ensure vegetation community restoration success. d. Remedial measures to be implemented in the event that performance standards are not achieved.	
Impact BIO-3: Jurisdictional Aquatic Resources. The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts.	Potentially Significant	**MM BIO-1** (as shown in Impact BIO-1A) and the following measures. **MM BIO-12: Aquatic Resource Avoidance.** Future refinements to the Proposed Project shall avoid jurisdictional aquatic resources regulated by the U.S. Army Corps of Engineers, Regional Water Control Board, and California Department of Fish and Wildlife, to the maximum extent practicable. As described in MM BIO-1, where feasible and appropriate, all jurisdictional aquatic resources not	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		directly affected by construction activities will be avoided and protected by establishing staking, flagging or fencing between the identified construction areas and aquatic resources to be avoided. **MM BIO-13: Aquatic Resource Compensation.** For any unavoidable impacts to jurisdictional aquatic resources, the City shall ensure that there is no net loss of such resources. This shall be accomplished by providing compensatory mitigation at a minimum ratio of 1:1 for temporary impacts and 2:1 for permanent impacts, or at other ratios as determined through negotiations with the regulatory agencies. A project-specific mitigation plan shall be developed for submittal to the U.S. Army Corps of Engineers, Regional Water Control Board, and/or California Department of Fish and Wildlife, as appropriate, through their respective regulatory permitting processes, and implemented. The mitigation plan shall specify the criteria and standards by which the mitigation will compensate for impacts of the Proposed Project and include discussion of the following: a. The mitigation objectives and type and amount of mitigation to be implemented; b. The location of the proposed mitigation site(s) (within the San Lorenzo River watershed, if possible); c. The methods to be employed for mitigation implementation (jurisdictional aquatic resource establishment, re-establishment, enhancement, and/or preservation); d. Success criteria and a monitoring program to ensure mitigation success; and e. Adaptive management and remedial measures in the event that performance standards are not achieved.	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact BIO-4: Wildlife Movement. The Proposed Project would not substantially degrade the quality or interfere with the use of a wildlife corridor or migratory route, or otherwise impede wildlife movement or use of native wildlife nursery sites.	Less than Significant	None	Less than Significant
Impact BIO-5: Cumulative Biological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to biological resources.	Less than Significant	None	Less than Significant
Cultural Resources and Tribal Cultural Resources			
Impact CUL-1: Historical (Built Environment Resources) Construction of the Proposed Project would not result in a substantial adverse change in the significance of historical built environment resource.	Less than Significant	None	Less than Significant
Impact CUL-2: Archaeological Resources and Human Remains. Construction of Proposed Project would not cause a substantial adverse change in the significance of unique archaeological resources or historical resources of an archaeological nature, and/or disturb human remains.	Less than Significant	None	Less than Significant
Impact CUL-3: Tribal Cultural Resources. Tribal Cultural Resources. Construction of the Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource.	Less than Significant	None	Less than Significant
Impact CUL-4: Cumulative Cultural Resource and Tribal Cultural Resource Impacts. Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
not result in a significant cumulative impact related to cultural resources and tribal cultural resources.			
Energy			
ENE-1: Result in Wasteful, Inefficient or Unnecessary Consumption of Energy Resources. The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.	Less than Significant	None	Less than Significant
ENE-2: Conflict with an Applicable Renewable Energy or Energy Efficiency Plan. The Proposed Project would not result in conflicts with or otherwise obstruct a state or local plan for renewable energy or energy efficiency.	Less than Significant	None	Less than Significant
ENE-3: Cumulative Energy Impacts. The Proposed Project, in combination with past, present and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy.	Less than Significant	None	Less than Significant
Geology and Soils			
Impact GEO-1: Seismic Hazards. The Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic-related ground failure, including liquefaction.	Less than Significant	None	Less than Significant
Impact GEO-2: Unstable Geologic Unit or Soils. The Proposed Project could potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and	Potentially Significant	**MM GEO-1: HDD Geologic Monitoring (Applicable to Brackney North section).** A California Certified Engineering Geologist (CEG) or Registered Geotechnical Engineer (RGE) shall monitor horizontal directional drilling (HDD) operations for potential ground subsidence or soil collapse along the HDD alignment. In the event that ground subsidence or soil collapse is observed, HDD operations shall cease pending completion of remedial measures. Remedial measures	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse.		shall include adjustments to drilling operations to preclude additional ground failure, as well as remedial measures to repair the area of ground failure. **MM GEO-2: HDD Inadvertent Fluid Return Plan (Applicable to Brackney North section).** An inadvertent fluid return contingency plan shall be prepared and implemented, including measures for training, monitoring, worst-case scenario evaluation, equipment and materials, agency notification and prevention, containment, clean up, and disposal of released drilling mud. Site-specific contingency measures shall be developed for the proposed HDD alignment, taking into consideration terrain, access, resource sensitivities, and proximity of suitable areas for staging inadvertent fluid return equipment. Preventative measures would include incorporation of recommendations by a geotechnical engineer, based on geotechnical investigations, to determine the most appropriate drilling mud mixture and drilling pressures. Drilling pressures shall be closely monitored by a CEG or RGE such that those pressures do not exceed pressures required to penetrate the rock formation. Monitoring by a minimum of two monitors, which could include the CEG or RGE, shall occur throughout drilling operations to ensure swift response in the event of inadvertent fluid return. In the event of inadvertent fluid return and if containment becomes necessary, containment shall be accomplished through construction of temporary berms/dikes and use of silt fences, straw bales, absorbent pads, straw wattles, and plastic sheeting. Any required clean up shall be accomplished with plastic pales, shovels, and portable pumps. The inadvertent fluid return contingency plan shall be submitted to the City for review and approval.	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact GEO-3: Expansive Soil. The Proposed Project would potentially be located on expansive soil, as defined by the 2019 California Building Code, but would not create substantial direct or indirect risks to life or property.	Less than Significant	None	Less than Significant
Impact GEO-4: Paleontological Resources. The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature.	Potentially Significant	**MM GEO-3: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring (Applicable to Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, and Graham Hill Road North sections).** Prior to commencement of any trenching activity on site, the City shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) (2010) guidelines. The paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the Proposed Project. The PRIMP shall be consistent with the SVP (2010 or most current version) guidelines and outline requirements for preconstruction meeting attendance and worker environmental awareness training; paleontological monitoring as required based on geological mapping, construction plans, and/or geotechnical reports; procedures for adequate paleontological monitoring and discoveries treatment; paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils); reporting; and collections management. The qualified paleontologist shall attend the preconstruction meeting and a qualified paleontological monitor shall be on site during all trenching and other significant ground-disturbing activities (including augering) in previously undisturbed, Lompico Sandstone, Monterey Formation, and Santa Margarita Sandstone deposits, as defined by the PRIMP. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.	
Impact GEO-5: Cumulative Geologic Hazards. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to geology and soils.	Less than Significant	None	Less than Significant
Impact GEO-6: Cumulative Paleontological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to paleontological resources.	Less than Significant	None	Less than Significant
Greenhouse Gas Emissions			
Impact GHG-1: Greenhouse Gas Emissions. The Proposed Project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant	None	Less than Significant
Impact GHG-2: Conflict with an Applicable Greenhouse Gas Reduction Plan. The Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	None	Less than Significant
Impact GHG-3: Cumulative Greenhouse Gas Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to greenhouse gas emissions, but the Proposed Project's contribution to this impact would not be cumulatively considerable.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Hazards and Hazardous Materials			
Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials. The Proposed Project would require use and transportation of petroleum products and small quantities of hazardous materials but would not result in a significant hazard to the public or environment.	Less than Significant	None	Less than Significant
Impact HAZ-2: Reasonably Foreseeable Upset or Accident Conditions. The Proposed Project would not 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.	Less than Significant		Less than Significant
Impact HAZ-3: Hazardous Emissions Near Schools. The Proposed Project would handle hazardous materials, petroleum products, and associated waste within 0.25 mile of existing schools but would not result in a significant hazard to the occupants of those schools.	Less than Significant	None	Less than Significant
Impact HAZ-4: Hazardous Materials Sites. The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment.	Potentially Significant	**MM HAZ-1: Hazardous Materials Management.** Prior to initiation of Project construction, the City shall complete soil sampling within the proposed pipeline route, adjacent to the former Santa Cruz Lumber Yard site at 5843 Graham Hill Road, and in the Brackney Road and Rose Acres Lane neighborhoods, including the Brackney North and Brackney South pipeline sections. Soil samples shall be collected to a depth of 3 feet below ground surface and analyzed for California Administrative Manual (CAM) (i.e., California Title 22) metals. In the event that Title 22 metals are detected at concentrations in excess of regulatory action levels, as determined by the California Department of Toxic Substances Control (DTSC) and/or Santa Cruz County Environmental Health Division, a Soil Management Plan shall	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		be developed that requires potential metals-impacted soils to be segregated and sampled to determine proper disposal options (i.e., hazardous versus nonhazardous landfill) or reuse (e.g., trench backfill). The City shall direct the contractor to consult with an industrial hygienist to determine the appropriate level of personal protective equipment (PPE), if any, that would be required for construction personnel during handling of potential metals-contaminated soil. The contractor shall implement the recommendations by the industrial hygienist to minimize potential exposure of construction personnel to metals concentrations in sediments during construction. All recommendations shall be completed in accordance with Occupational Safety and Health Administration (OSHA) Training Requirements (29 CFR 1910.132 and 1910.134, Subpart I – Personal Protective Equipment).	
Impact HAZ-5: Cumulative Hazardous Materials Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to: 1) routine transport, use, disposal, or accidental release of hazardous materials, 2) hazardous emissions or hazardous materials use within 0.25 mile of an existing or proposed school, or 3) hazardous materials sites compiled pursuant to Government Code Section 65962.5.	Less than Significant	None	Less than Significant
Hydrology and Water Quality			
Impact HYD-1: Surface Water Quality Standards and Waste Discharge Requirements. Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except for potential inadvertent	Potentially Significant	**MM GEO-2** (as shown in Impact GEO-2	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
release of drilling fluids in the Brackney North pipe section. In addition, the Proposed Project would not conflict with or obstruct implementation of a water quality control plan related to surface water.			
Impact HYD-2: Alteration of Drainage Patterns. The Proposed Project would not 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; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows.	Less than Significant	None	Less than Significant
Impact HYD-3: Cumulative Water Quality Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to water quality or alteration of drainage patterns.	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Noise			
Impact NOI-1: Substantial Permanent Increase in Ambient Noise Levels. Operation of the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during long-term operation in the vicinity the project components.	Less than Significant		Less than Significant
Impact NOI-2: Substantial Increase in Ambient Noise Levels in Excess of Standards. Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established in local general plans or noise ordinances. Operation of the Proposed Project would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Proposed Project in excess of applicable standards.	Significant	**MM NOI-1: Construction Noise (Applies to all segments).** The Proposed Project shall implement the following measures related to construction noise: • Restrict construction activities and use of equipment that have the potential to generate significant noise levels (e.g., use of concrete saw, mounted impact hammer, jackhammer, rock drill, etc.) to between the hours of 8:00 AM and 5:00 PM, unless specifically identified work outside these hours is authorized by the City's Water Director as necessary to allow for safe access to a construction site, safe construction operations or efficient construction progress, such as required by the HDD pullback operations for the Brackney North segment. • Construction activities requiring operations continuing outside of the standard work hours of 8:00 AM and 5:00 PM (e.g., HDD operations for the Brackney North and Brackney South sections) shall locate noise generating equipment as far as possible from noise-sensitive receptors, and/or within an acoustically rated enclosure (meeting or exceeding Sound Transmission Class [STC] 27), shroud or temporary barrier as needed to limit the propagation of sound into the surrounding areas in excess of the 60 dBA nighttime (10:00 PM to 8:00 AM) criteria at the nearest sensitive receptor. Noisy construction equipment, such as aboveground conveyor systems, and impact tools will likely require location within such an	Significant and Unavoidable for Brackney North and Brackney South and Less than Significant for other pipe sections

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		acoustically rated enclosure, shroud or barrier to meet the above criteria. Impact tools, in particular, shall have the working area/impact area shrouded or shielded whenever possible, with intake and exhaust ports on power equipment muffled or suppressed. • Use of temporary or portable, application-specific noise shrouds, barriers or enclosures shall be required to shield nearby noise-sensitive receptors from equipment and operations that have the potential to generate noise levels in excess of the 75 dBA daytime (8:00 a.m. to 10:00 p.m.) criteria, as measured at nearby sensitive receptors. This generally corresponds with a distance of 125 feet from construction activities to the nearest sensitive receptor, however site-specific factors will need to be taken into consideration, such as the specific construction equipment mix, and intervening structures or topography that may result in associated noise reductions below the acceptable daytime noise threshold. • Portable and stationary site support equipment (e.g., generators, compressors, and cement mixers) shall be located as far as possible from nearby noise-sensitive receptors. • Construction equipment and vehicles shall be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Internal-combustion-powered equipment shall be equipped with properly operating noise suppression devices (e.g., mufflers, silencers, wraps) that meet or exceed the manufacturer's specifications. Mufflers and noise suppressors shall be properly maintained and tuned to ensure proper fit, function, and minimization of noise. • Construction equipment shall not be idled for extended periods of time (i.e., 5 minutes or longer) in the immediate vicinity of noise-sensitive receptors.	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact NOI-3: Groundborne Vibration. Construction of the Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels.	Less than Significant	**None**	Less than Significant
Impact NOI-4: Cumulative Noise Impacts. Construction and operation of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to noise and vibration.	Less than Significant	None	Less than Significant
Transportation			
Impact TRA-1: Conflict with Program, Plan, Ordinance, or Policy Addressing the Circulation System. Construction and operation of the Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	Less than Significant	None	Less than Significant
Impact TRA-2: Vehicle Miles Traveled. Construction and operation of the Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause an increase in VMT which is greater than 15% below the regional average VMT.	Less than Significant	None	Less than Significant
Impact TRA-3: Emergency Access. Construction of the Proposed Project would not result in inadequate emergency access or impair implementation of or interfere with an emergency evacuation plan.	Less than Significant	None	Less than Significant
Impact TRA-4: Cumulative Transportation Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would	Less than Significant	None	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
not result in a significant cumulative impact related to transportation.			
Wildfire			
Impact WIL-1: Wildfire Hazards. The Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	Less than Significant	None	Less than Significant
Impact WIL-2: Cumulative Wildfire Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to significant risk of loss, injury, or death involving wildland fires.	Less than Significant	None	Less than Significant

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2 Introduction

2.1 Purpose of the EIR

This environmental impact report (EIR) has been prepared by the City of Santa Cruz (City), which is the lead agency for the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). This EIR has been prepared in accordance with the California Environmental Quality Act (CEQA), which is found in the California Public Resources Code, Division 13, and with the CEQA Guidelines, which are found in Title 14 of the California Code of Regulations, commencing with Section 15000. Under CEQA, the lead agency for a project is the public agency with primary responsibility for carrying out or approving the project, and for implementing the requirements of CEQA.

As stated in the CEQA Guidelines Section 15002, the basic purposes of CEQA are to:

- Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Pursuant to CEQA Guidelines Section 15121, an EIR is an informational document that is required to (1) identify the potentially significant environmental effects of a project on the environment, (2) indicate the manner in which those significant effects can be avoided or significantly lessened via the implementation of potentially feasible mitigation measures, (3) identify a reasonable range of potentially feasible alternatives to a project that would eliminate or substantially lessen any significant environmental effects, and (4) identify any significant and unavoidable adverse impacts that cannot be mitigated or otherwise reduced. The lead agency must consider the information in the EIR along with other information which may be presented to the agency. While the information in the EIR does not control the ultimate decision about a project, the agency must consider the information in the EIR and respond to each significant effect identified in the EIR by making findings pursuant to Public Resources Code Section 21081.

Pursuant to Public Resources Code Section 21002, public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures that would substantially lessen the significant environmental effects of such projects. Furthermore, pursuant to CEQA Guidelines Section 15021, CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible. In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors. As defined in the CEQA Guidelines, “feasible” means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors. This section further indicates that under CEQA, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and

social factors, in determining whether and how a project should be approved. CEQA Guidelines Section 15093 provides that, if an agency decides to approve a project that will cause one or more significant effects on the environment, the agency must prepare a "statement of overriding considerations" to reflect the ultimate balancing of competing public objectives. The environmental review process is further explained below in Section 2.4, Environmental Review and Approval Process.

2.2 Project Overview

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch ductile iron or polyvinyl chloride (PVC) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), which includes road pavement and unpaved shoulders adjacent to the paved road, and/or existing City easements. In order to focus the environmental review on specific locations along the 8.75-mile pipeline, the alignment was separated into a northern segment and a southern segment; these segments were further delineated into specific sections as described below.

The proposed northern NCP segment from the Newell Creek Access Road Bridge just south of Newell Creek Dam to the Felton Booster Pump Station (FBPS) generally follows the existing NCP alignment. There are six distinct sections that comprise the northern segment, generally named for the roads in proximity to the pipe or other notable features nearby: Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, San Lorenzo Way, and Felton Booster Pump Station.

The proposed southern NCP segment from the FBPS to the Graham Hill Water Treatment Plant (GHWTP) generally includes a new pipeline alignment along Graham Hill Road, except where it already exists in Graham Hill Road between the southern edge of Henry Cowell State Park and the GHWTP. The new pipe would replace the existing pipe that is located within Pipeline Road in Henry Cowell Redwoods State Park by relocating it into Graham Hill Road. The southern segment is comprised of two sections, Graham Hill Road North and Graham Hill Road South.

Other components of the Proposed Project include cathodic protection and installation and/or replacement of minor appurtenances, such as air release valves and isolation valves. Once the new pipeline is installed and the interconnections are made, the existing NCP generally would be abandoned in place.

Three pipeline sections have been identified for replacement in the near term: two sections along Graham Hill Road, comprising the entire southern segment that would replace the existing pipe through Henry Cowell Redwoods State Park, and the Brackney North section in the northern segment. The engineering design phase for these sections is underway. For the remainder of the pipeline alignment, a conservative project scenario is assumed, which includes installation of the new pipeline within specified construction disturbance corridors.

Standard construction practices would be implemented by the City or its contractors during construction of the Proposed Project to avoid or minimize erosion and water quality degradation, protect sensitive species and habitat, reduce potential impacts to cultural resources, and reduce air quality and noise impacts. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements.

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately late 2022/early 2023 to 2032. The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first, with an estimated construction schedule of about 24 months for the Graham Hill Road sections and approximately 9 months for the Brackney North section, including pipeline installation, road repaving, abandonment of the existing NCP, and post-construction revegetation where needed. The remainder of the pipeline sections are expected to be constructed by 2032.

A full description of all project components is provided in Chapter 3, Project Description, of this EIR.

2.3 Scope of the EIR

A Notice of Preparation (NOP) was published for the Proposed Project to determine the scope and extent of environmental issues to be addressed in this EIR and is it included in Appendix A. Based on review of the Proposed Project (see Chapter 3) and public comments received in response to the NOP (see Section 2.4.1, Scoping), the City has determined that certain environmental resource topics merit a detailed analysis while others were determined not to be significant and will not be discussed in detail in the EIR. The EIR also evaluates topics required by CEQA and the CEQA Guidelines, including growth inducement, project alternatives, and cumulative impacts.

Regarding the scope of the EIR analysis, CEQA Guidelines Section 15060(d) states, "if the lead agency can determine that an EIR will be clearly required for a project, the agency may skip further initial review of the project and begin work directly on the EIR process….In the absence of an initial study, the lead agency shall still focus the EIR on significant effects of the project and indicate briefly its reasons for determining that other effects would not be significant or potentially significant." CEQA Guidelines Section 15128 states that an EIR "shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and therefore were not discussed in detail in the EIR." Section 4.1, Impacts Not Found to be Significant, of this EIR is intended to satisfy the requirement of CEQA Guidelines Section 15128 and provides additional information and further documents the reasons that various possible effects of a project were determined not to be significant and therefore were not discussed in detail in the EIR. Environmental resource topics discussed in that section include: aesthetics, agriculture and forest resources, land use, mineral resources, population and housing, public services, recreation, and utilities and service systems.

In the other sections of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the EIR provides a detailed evaluation of the following environmental resource topics:

- Air Quality
- Biological Resources
- Cultural Resources and Tribal Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality

- Noise and Vibration
- Transportation
- Wildfire

As indicated above, the environmental review focuses on the potentially significant environmental effects of the Proposed Project. As defined in CEQA Guidelines Section 15382, a "significant effect on the environment" is "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether a physical change is significant."

In evaluating the significance of the environmental effect of a project, the CEQA Guidelines require the lead agency to consider direct physical changes in the environment and reasonably foreseeable indirect physical changes in the environment which may be caused by the project (CEQA Guidelines Section 15064[d]). A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project. An indirect physical change in the environment is a physical change in the environment, which is not immediately related to the project, but which is caused indirectly by the project. An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project.

CEQA Guidelines Section 15064(e) further indicates that economic and social changes resulting from a project shall not be treated as significant effects on the environment, although they may be used to determine that a physical change shall be regarded as a significant effect on the environment. In addition, where a reasonably foreseeable physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project.

2.4 Environmental Review and Approval Process

2.4.1 Scoping

CEQA Guidelines Section 15083 authorizes and encourages an early consultation or scoping process to help identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed and considered in an EIR, and to help resolve the concerns of affected regulatory agencies, organizations, and the public. Scoping is designed to explore issues for environmental evaluation, ensuring that important considerations are not overlooked and uncovering concerns that might otherwise go unrecognized.

The NOP for this EIR was circulated for a 30-day comment period from January 15, 2021 to February 16, 2021. The NOP was circulated to the State Clearinghouse and to local, regional, and federal agencies in accordance with the CEQA Guidelines. The NOP also was sent to organizations and interested citizens that have requested

notification for City projects. Due to restrictions from the Covid-19 pandemic,[1] a virtual public scoping meeting was held on February 2, 2021, and the corresponding presentation about the Proposed Project was posted on the City's website at http://www.cityofsantacruz.com/waterenvdocs. No comments regarding the scope of EIR analysis were received at the scoping meeting.

Written comments were received from one public agency. This letter is included, along with the NOP, in Appendix A. Comments that address environmental issues have been taken into consideration in the preparation of this EIR. Table 2-1 provides a summary of scoping comments and indicates where they are addressed in the EIR or if they are beyond the scope of the EIR.

Table 2-1. Scoping Comment Summary

Summary of Comment	EIR Section Considered
Native American Heritage Commission (NAHC)	
Description of regulations requiring consultation with Native American tribes and recommendation to initiate consultation as early as possible.	Section 4.4, Cultural Resources and Tribal Cultural Resources Appendix D, Archaeological Resources Inventory and Evaluation Report and Historical Resources Inventory, Evaluation and Finding of Effect Report
List of NAHC recommendations for cultural resources assessments.	Section 4.4, Cultural Resources and Tribal Cultural Resources Appendix D, Archaeological Resources Inventory and Evaluation Report and Historical Resources Inventory, Evaluation and Finding of Effect Report

2.4.2 Public Review of the Draft EIR

This Draft EIR has been published and circulated for review and comment by the public and other interested parties, agencies, and organizations for a 45-day public review period from November 22, 2021 through January 5, 2022. The Draft EIR will be available for public review during the comment period at the following locations:

- Online at http://www.cityofsantacruz.com/waterenvdocs.
- City of Santa Cruz Water Department Engineering Counter, located at 212 Locust Street, Suite C in Santa Cruz, by appointment only.[2]

[1] Due to the Shelter-In-Place Order issued on March 16, 2020 by the County of Santa Cruz in response to the 2019 novel coronavirus disease (COVID-19) pandemic, the meeting was held on the phone for remote participation. Notice of this meeting, how to attend the virtual meeting, and how to access the materials online was sent to the City's mailing list in advance of the scoping meeting. This notice was posted on the City's website, the City Hall campus notice board, and on the project site, and it was sent to the same distribution list as the NOP (excluding the State Clearinghouse and the County Clerk).

[2] Due to the novel coronavirus disease (COVID-19) pandemic, in-person review of hard copies requires advance appointments, which can be made Monday through Thursday, 8:00 AM to 12:00 PM and 1:00 PM to 4:00 PM. Please email waterengineering@cityofsantacruz.com or call (831) 420-5210 to schedule an appointment.

- A hard copy of the Draft EIR is also available at the libraries below; check with https://www.santacruzpl.org/ or call 831.427.7713 for library hours and document access information:
    - Downtown, located at 224 Church Street, in Santa Cruz
    - Felton, located at 6121 Gushee Street, in Felton

Written comments on this Draft EIR may be submitted to the City of Santa Cruz at the address below or by email to Danny DeBrito at ddebrito@cityofsantacruz.com.

Danny DeBrito, Associate Planner
City of Santa Cruz Water Department
212 Locust Street, Suite C
Santa Cruz, CA 95060

The City of Santa Cruz encourages public agencies, organizations, community groups, and all other interested persons to provide written comments on the Draft EIR prior to the end of the public review period. One public meeting will be held online on December 9, 2021 at 5:30 PM to provide information on the Proposed Project and take public written comments on the Draft EIR.

CEQA Guidelines Section 15204(a) provides guidance on the focus of review of EIRs, indicating that in reviewing draft EIRs, persons and public agencies "should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated," and that comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. This section further states that "reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project. CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good faith effort at full disclosure is made in the EIR."

2.4.3 Final EIR and Consideration of Project Approval

Following the close of the public comment period on this Draft EIR, responses will be prepared for all comments received that raise CEQA-related environmental issues regarding the Proposed Project. The Final EIR will include written responses to comments received in accordance with CEQA Guidelines Section 15088 and will also include any text changes to the Draft EIR that become necessary after consideration of public comments.

The Final EIR will be presented to the Santa Cruz City Council for a final decision on the Proposed Project. Prior to making a decision to approve a project, the City Council must certify that it has reviewed and considered the information in the EIR, that the EIR has been completed in conformity with the requirements of CEQA, and that the document reflects the City's independent judgment.

Pursuant to Sections 21002, 21002.1, and 21081 of CEQA and Sections 15091 and 15093 of the CEQA Guidelines, no public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant effects unless both of the following occur:

(a) The public agency makes one or more of the following findings with respect to each significant effect:

  (1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects on the environment.

  (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by such other agency.

  (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternative identified in the environmental impact report.

(b) With respect to significant effects which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment.

The decision to adopt a project must take into account the findings described above, especially regarding feasibility, based on the entirety of the agency's administrative record as it exists after completion of a Final EIR.

2.4.4 Adoption of Mitigation Monitoring and Reporting Program

CEQA requires that a program to monitor and report on mitigation measures be adopted by a lead agency as part of the project approval process. CEQA requires that such a program be adopted at the time the agency approves a project or determines to carry out a project for which an EIR has been prepared to ensure that mitigation measures identified in the EIR are implemented. The Mitigation Monitoring and Reporting Program will be included in the Final EIR.

2.5 Use of the EIR

The EIR includes a "project-level" analysis, meaning that no additional CEQA review should be required if the Proposed Project is approved and constructed without change. Pursuant to CEQA Guidelines Section 15161, the EIR examines all phases of the Proposed Project including construction and operation.

The City of Santa Cruz is the lead agency and responsible for approving and implementing the Proposed Project. CEQA requires that decision makers review and consider the EIR in their consideration of this Proposed Project; other agencies with permit authority over the Proposed Project are identified in Section 3.8, Project Permits and Approvals.

2.6 Organization of the EIR

The content and format of this EIR are designed to meet the requirements of CEQA and the CEQA Guidelines (Sections 15122 through 15132). This EIR is organized into the following chapters; all cited references are identified at the end of each chapter and section in Chapter 4:

- **Chapter 1, Summary**, presents an overview of the Proposed Project, provides a summary of the impacts of the Proposed Project and mitigation measures, provides a summary of the alternatives being considered, includes a discussion of known areas of controversy, and any issues to be resolved.
- **Chapter 2, Introduction**, explains the CEQA process, and describes the scope and purpose of this EIR, provides information on the review and approval process, and outlines the organization of this EIR.
- **Chapter 3, Project Description**, provides information about the location, setting, and background of the Proposed Project; identifies project-specific objectives; and provides a detailed description of the Proposed Project components and its construction and operation.
- **Chapter 4, Existing Conditions, Impacts, and Mitigation Measures**, explains the approach to the environmental analysis for this EIR and provides the environmental setting, impacts, and mitigation measures for the topics identified for detailed analysis in the EIR. Section 4.0, Introduction to Analysis, includes a description of the cumulative condition, and Section 4.1, Impacts Not Found to Be Significant, describes the topics that do not warrant further analysis. For the subsequent sections pertaining to the environmental resource topics for which a detailed analysis is provided, each section presents information in three parts, including existing conditions, regulatory framework, and impacts and mitigation measures. See Section 4.1 for additional information about the organization and content of this chapter.
- **Chapter 5, Other CEQA Considerations**, evaluates the topics required to be included in an EIR, including significant and unavoidable impacts, significant irreversible environmental changes, and growth-inducing impacts.
- **Chapter 6, Alternatives**, evaluates alternatives to the Proposed Project that would eliminate or substantially reduce significant impacts identified in the EIR while reasonably attaining project objectives. Alternatives that were reviewed but eliminated from further consideration in the EIR are also discussed.
- **Chapter 7, List of Preparers**, identifies individuals who were involved in preparing this EIR.
- **Appendices** contain additional information used in preparing this EIR. Appendix A contains the NOP and the comments that were submitted in response to the NOP. Appendix B contains the Biological Resources Assessment prepared for the Proposed Project. Appendix C contains the Cultural Resources reports (archaeological and historical) prepared for the Proposed Project. Appendix D includes results of the noise modeling conducted for the Proposed Project, and Appendix E contains the results of the air quality and greenhouse gas emissions modeling conducted for the Proposed Project.

3 Project Description

This chapter provides a detailed description of the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). It includes information about the location and setting; existing facilities and operations; background on the City of Santa Cruz Water Department (City) and the NCP; Proposed Project purpose and objectives; Proposed Project components; construction schedule and activities; operations and maintenance (O&M); the City's Standard Construction Practices incorporated into the Proposed Project; and anticipated required permits and/or approvals for the Proposed Project. This chapter is based on the 30% design drawings and Basis of Design Reports prepared by the City's consulting design engineers for three of the proposed pipeline sections (Carollo 2021, Mott MacDonald 2021b), and other background studies prepared for the Proposed Project (HDR 2020, 2019a, 2019b, 2019c, 2018; Kennedy Jenks 2017; Mott MacDonald 2021a).

3.1 Project Location and Setting

The existing NCP is located in the Santa Cruz Mountains, primarily in the unincorporated San Lorenzo Valley area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City of Santa Cruz, but is surrounded by unincorporated lands. Both the existing NCP and the Proposed Project extend approximately 9 miles between GHWTP on the south and Newell Creek Dam, a City facility that impounds Loch Lomond Reservoir, on the north (see Figure 3-1).

The existing NCP and Proposed Project alignment are located within a primarily semi-rural area. The areas surrounding the existing NCP and Proposed Project are characterized by forested terrain with rural and semi-rural, low-density residential neighborhoods and limited commercial development, as well as areas of California State Parks land. Several streams are present in the general vicinity of the NCP, including San Lorenzo River, Zayante Creek, and Newell Creek.

The northern segment of the existing pipeline extends from just south of the existing Newell Creek Dam to the Felton Booster Pump Station (FBPS), located at the intersection of Graham Hill Road and East Zayante Road. The northern segment is located east of State Route 9 (locally referred to as Highway 9) and north of Mount Hermon Road, generally between the unincorporated communities of Felton and Ben Lomond and west of Lompico. The existing pipeline extends south from the toe of Newell Creek Dam and generally follows existing roads through residential neighborhoods, but also extends through undeveloped private property along an abandoned railroad bed in the Brackney Road and Rose Acres Lane neighborhoods. Additionally, the existing pipeline traverses a portion of a small shopping center located at the Graham Hill Road/Mount Hermon Road intersection. The Proposed Project would generally follow the existing pipeline alignment in the northern segment with some minor realignments as described in Section 3.5.2.1. Both the existing NCP and Proposed Project pipeline cross Newell Creek in two locations in the northern segment. The San Lorenzo River also is a major natural feature in the area, and is located just west and parallel to the existing pipeline and Proposed Project in some sections in the northern segment.

The southern segment of the existing NCP extends from the FBPS to the GHWTP. The existing pipeline extends from the FBPS under Zayante Creek and follows a dirt maintenance road in a 20-foot easement to

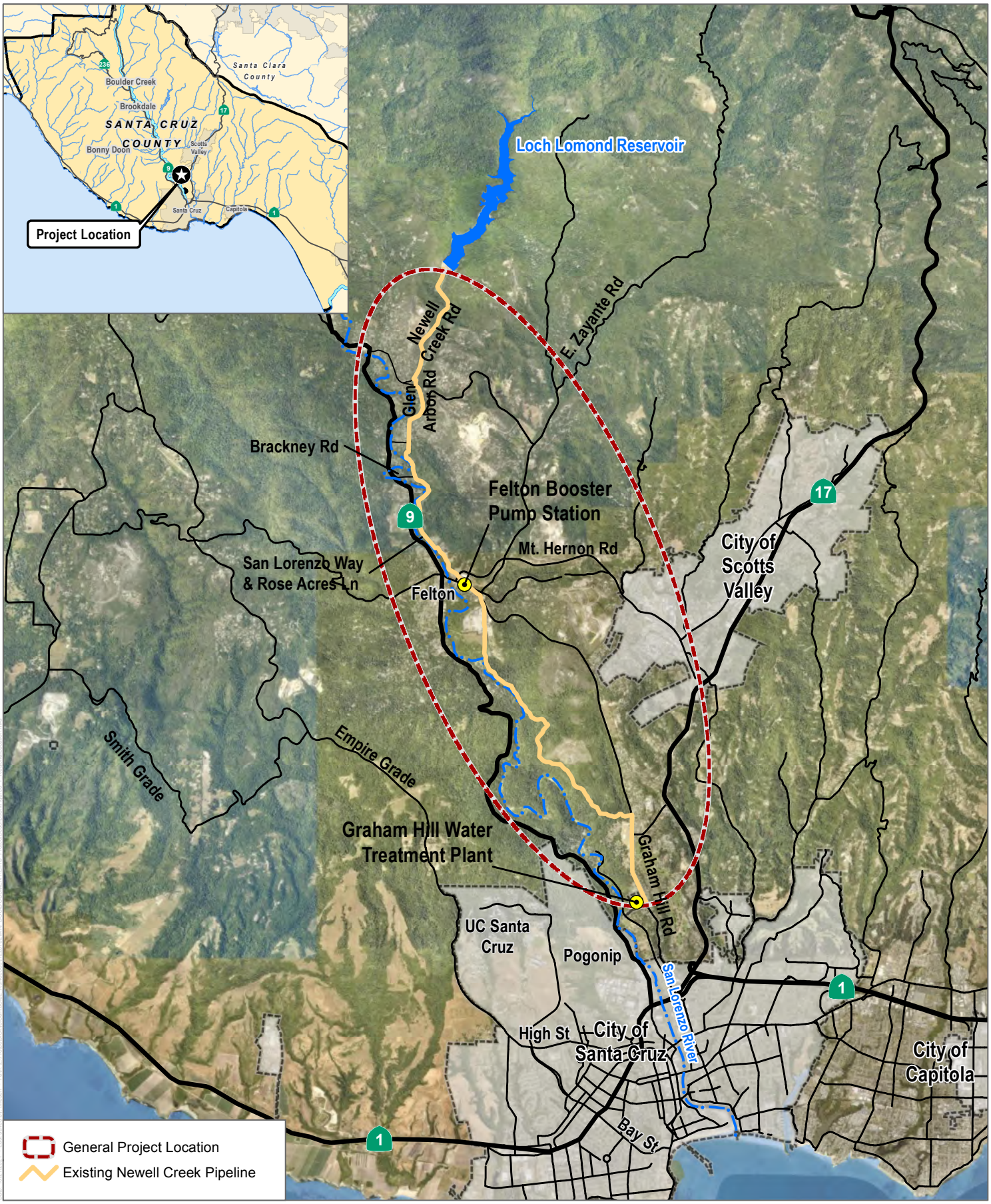
the San Lorenzo Lumber Yard where it continues southerly within a 20-foot easement to the border of Henry Cowell Redwoods State Park. The existing pipeline traverses the State Park within an easement along Pipeline Road until it intersects Graham Hill Road at Nepenthe Drive. The topography along Pipeline Road is mountainous terrain which results in several steeply sloped pipe sections. At the intersection of Graham Hill Road and Pipeline Road, the existing NCP continues southbound along Graham Hill Road for approximately one mile to the GHWTP. The Proposed Project would extend from the FBPS over Zayante Creek on abutments at a former railroad crossing in the northernmost portion of the southern segment and follow a short section along the existing NCP easement and alignment, before it would then be rerouted to Graham Hill Road as described in Section 3.5.2.2. The proposed pipeline would cross under the Santa Cruz Big Trees Rail line, a tourist railroad extending from the Roaring Camp rail depot, before entering Graham Hill Road. There is a mix of commercial, park and open space uses at the northern end of the southern segment for both the existing pipeline and the Proposed Project. The southern portion of the southern segment of the Proposed Project sections along Graham Hill Road traverse areas of open forested lands, state park lands, and residential uses.

Access to the existing pipeline for maintenance and to the Proposed Project segments for construction and future maintenance is provided by both regional and local roads. Access to the existing pipeline and Proposed Project northern segment is provided by Graham Hill Road, Mount Hermon Road, and State Route 9 (locally referred to as Highway 9), as well as several County roads, including Glen Arbor Road, Newell Creek Road, Brackney Road, San Lorenzo Way, and Rose Acres Lane. Access to the existing NCP and the Proposed Project southern segment is provided from Graham Hill Road, Mount Hermon Road, and Highway 9. Pipeline Road, a partially paved trail through Henry Cowell Redwoods State Park, provides access to the existing NCP section in this location, In addition to the public roadways providing access to the existing and Proposed Project segments. City easements on private land serve portions of the existing alignments and would continue to serve the Proposed Project segments, with a few minor modifications.

3.2 Existing Facilities

The existing 9.25-mile NCP was constructed in 1960 in conjunction with construction of the Newell Creek Dam. The pipeline consists of two segments with the FBPS being the dividing point. The northern segment extends from just south of Newell Creek Dam to the FBPS; the southern segment extends from the FBPS to the GHWTP (see Figure 3-2). The pipeline material is predominantly concrete cylinder pipe, which is composed of a steel cylinder lined with cement mortar. and wrapped with steel bar and coated with concrete on the exterior. The existing NCP includes three creek crossings—two over Newell Creek in the northern segment and one under Zayante Creek in the southern segment—as well as numerous culverted creek and drainage crossings.

The existing pipeline size ranges in diameter from 18 inches to 27 inches, with the majority of the pipeline being 20 or 22 inches in interior diameter (HDR 2020). According to the 1960 Construction Specifications, the northern segment consists of approximately 22,670 linear feet of 22-inch pipeline. The southern segment consists of approximately 3,700 linear feet of 27-inch, 11,335 feet of 22-inch, 8,797 feet of 20-inch, and 1,151 feet of 18-inch-diameter pipeline.



SOURCE: ESRI 2020, City of Santa Cruz 2020

DUDEK

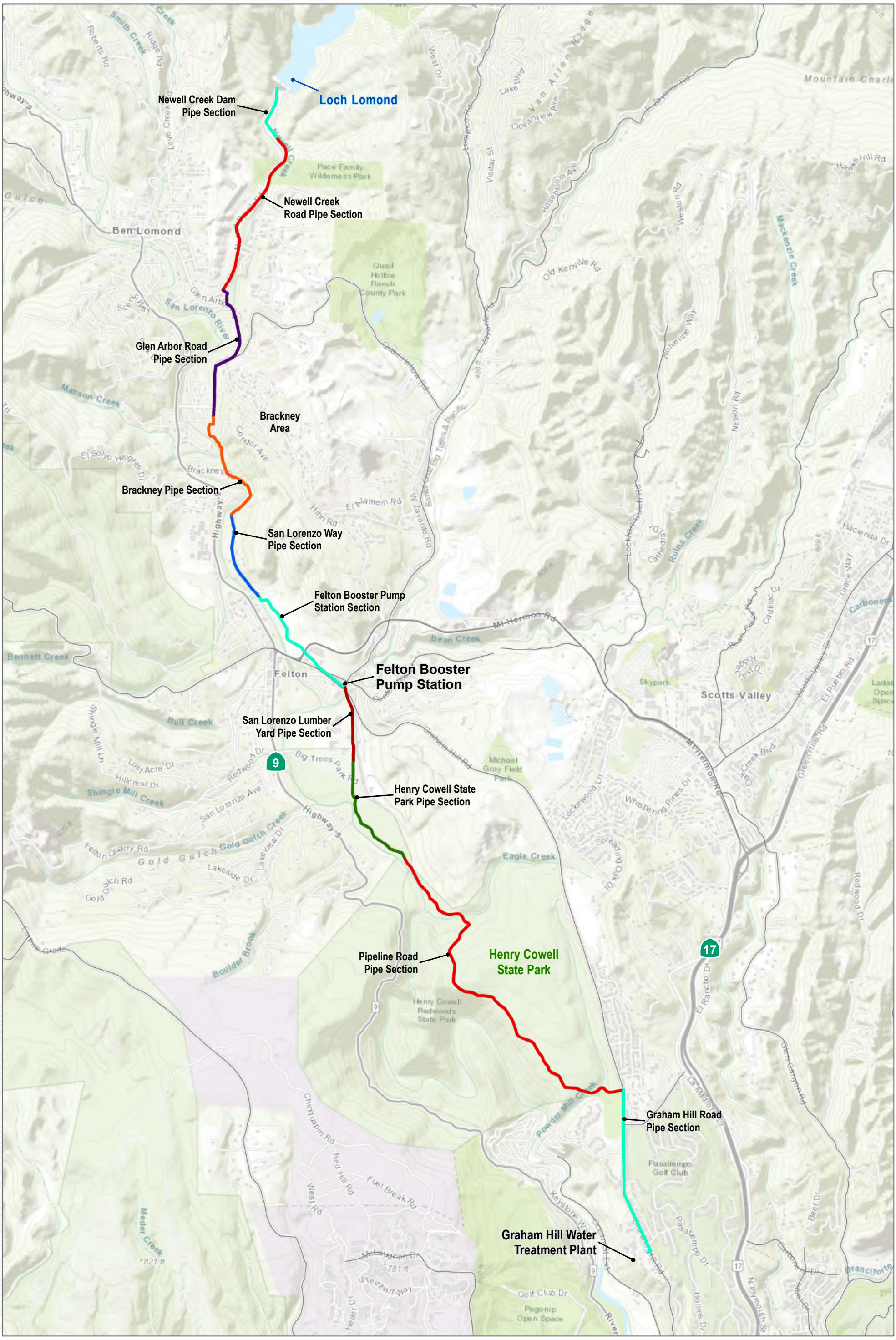
0 3,750 7,500 Feet

FIGURE 3-1

Project Location

Newell Creek Pipeline Improvement Project

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SOURCE: ESRI 2020, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

DUDEK

0 1,400 2,800 Feet

FIGURE 3-2

Existing Newell Creek Pipeline Alignment

Newell Creek Pipeline Improvement Project

The NCP is a critical component of the City's raw water supply infrastructure. It conveys untreated water to and from the Loch Lomond Reservoir, which is the City's only raw water storage facility. The pipeline is critical to supplying the water system during dry seasons and during storm events when other water sources cannot be treated at GHWTP and also is critical in conveying untreated water from the existing Felton Diversion to the Reservoir for storage.

The NCP conveys water to the water system via the FBPS to the GHWTP for treatment and distribution into the City's water service area. The FBPS is located approximately midway along the NCP alignment at the intersection of Graham Hill Road and East Zayante Road. When the San Lorenzo River has high flows and storage is available in the Loch Lomond Reservoir, the NCP is also used to pump water from the Felton Diversion on the San Lorenzo River up to the Reservoir (via the FBPS) to store for later use. Although the NCP is not used continuously, it is a critical component to the City's water supply when needed during both wet and dry seasons. It is also a backup source should one of the City's other raw water supplies become inoperable (HDR 2020).

3.3 Project Background

3.3.1 Santa Cruz Water Department

The City serves approximately 24,590 connections in its approximately 20-square-mile service area, which includes the City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, and coastal agricultural lands north of the City of Santa Cruz. The population within this service area is approximately 96,170 persons. The City's water production is approximately 5 to 7 million gallons per day during the winter and approximately 7 to 10 million gallons per day during the summer. The City's service area and key existing facilities are shown on Figure 3-3.

The City has embarked on a multi-year Santa Cruz Water Program to renovate and upgrade its water system. The program includes water supply and infrastructure projects to improve reliability and resiliency and address aging infrastructure. The program includes plans and funding for numerous projects, including rehabilitation or replacement projects, upgrades and improvements projects, water supply reliability studies, and water main replacements (HDR 2020).

3.3.2 Newell Creek Pipeline

There are a number of known concerns regarding the condition and operation of the existing NCP. Generally, the pipeline, constructed approximately 60 years ago, is reaching the end of its reliable life and is experiencing increased frequency of breaks as a result of corrosion and land movement along portions of its alignment due to geological conditions. There is no functioning cathodic protection system[1] on the pipeline and corrosion has been observed, which presents risks of leaks and failure.

[1] Cathodic protection is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected to a more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal. For structures such as long pipelines, where passive galvanic cathodic protection is not adequate, an external DC electrical power source is used to provide sufficient current.

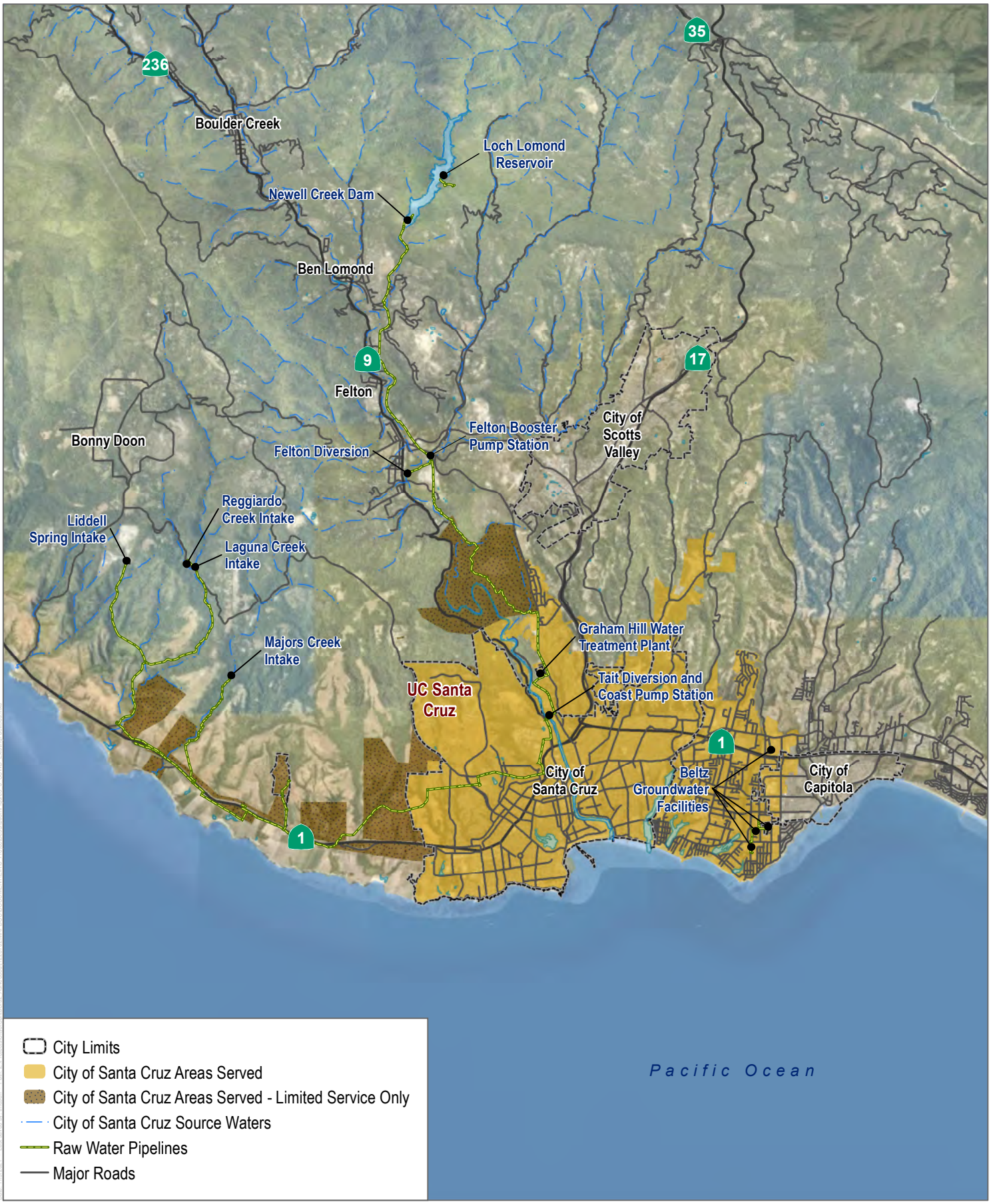
Due to steep terrain and landslides present in some locations, the existing NCP has been damaged and/or is located in areas that make access and repairs difficult. A portion of the existing NCP along Pipeline Road in Henry Cowell Redwoods State Park has the highest recent break history, and several areas of Pipeline Road have washed out, resulting in exposure of the pipeline. Another portion of the NCP was constructed in an old railroad bed along a steep hillside in the Brackney area, east of Highway 9 between Felton and Ben Lomond, which includes several landslide hazard areas that could cause stress or breakage of the pipeline as further explained below. Furthermore, some appurtenances, such as isolation valves are inoperable, or are in unknown locations, and some portions of the existing pipeline alignment have accessory structures (such as fences, retaining walls and sheds) constructed on top of the pipeline (HDR 2018).

The pipeline section that runs through the Brackney area has a history of landslides and geotechnical failures during heavy winter rains that threaten the integrity of the pipeline.. This section has been historically subject to repeated landslides during heavy winter rains. In addition, the NCP is located above and adjacent to the San Lorenzo River, which during high flows in winter storms has the potential to undermine the hillside and increase the risk of failure. Due to the evidence of unstable terrain due to the poor bearing capacity of the saturated soils, the continued buildup of landslide debris overburden over the pipeline, and the location of the pipeline next to the San Lorenzo River, the NCP is at a high risk of failure in the Brackney North area. In particular, the NCP is vulnerable to a leak, which may be exacerbated by other factors in the vicinity of the Brackney landslide including undermining by San Lorenzo River flooding and proximity to the Butano fault zone (Kennedy Jenks 2017). Additionally, the Brackney pipeline section is one of the few sections that is not accessible by paved road, making repairs and maintenance challenging (HDR 2019c).

Existing NCP pipeline segments were evaluated by the City and their consultants to determine sections with the greatest risk of failure. Both the likelihood of failure and consequence of failure were evaluated. As ranked in the *Newell Creek Pipeline Prioritization of Pipeline Risk Technical Memorandum* (HDR 2019c), the existing segment sections were prioritized in order of relative consequence and likelihood of failure (and, thus, order of priority for replacement and/or rehabilitation). The sections with the highest priority for replacement are the sections along Pipeline Road in Henry Cowell Redwoods State Park (a portion of the southern segment) and the Brackney North section (a portion of the northern segment).

Planning for the Proposed Project commenced in 2018, and a series of technical studies and reviews have been conducted to evaluate existing pipeline conditions and various replacement and/or rehabilitation alternatives, including alternative alignments. See Section 6, Alternatives, for further discussion. The Proposed Project alignment was selected based on an evaluation process that considered the following factors: public safety, environmental issues and compliance, O&M accessibility, encroachment permitting, construction and O&M costs, and impacts to other facilities (HDR 2019a).

A major capital improvement project at the Newell Creek Dam, consisting of replacement of the dam's inlet/outlet facilities and appurtenances, was approved and permitted in 2019, and construction was initiated in May 2020. It is noted that approximately 2,000 linear feet of the northernmost section of the existing NCP is not part of this Proposed Project, but was replaced in 2020 during the first phase of the Newell Creek Dam Inlet/Outlet Replacement Project from the toe of the dam to just upstream of the Newell Creek Road Access Bridge.



SOURCE: ESRI 2020, City of Santa Cruz 2020

FIGURE 3-3

Santa Cruz Water Deparment Service Area and Existing Facilities

Newell Creek Pipeline Improvement Project

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3.4 Project Purpose and Objectives

3.4.1 Purpose and Need

The purpose of the Proposed Project is to address the identified deficiencies in existing pipeline conditions, including mitigation of geological hazards, as well as provide improved access for maintenance and repair. As described in Section 3.3.2, having been constructed in approximately 1960, the NCP is reaching the end of its reliable life and is experiencing increased frequency of breaks due to corrosion and land movement along portions of its alignment due to geological conditions. In addition to the age of the existing pipeline, development throughout Santa Cruz County over the past 60 years has created differing conditions along the pipeline alignment from its original installation, which has resulted in constraints to accessing the pipeline for maintenance and repair activities due to intervening private development. Various surface improvements were made as part of the pipeline installation (unpaved access roads, drainage crossings, appurtenant features), which have also experienced approximately 60 years of wear, including pipe corrosion, and are in need of replacement and/or rehabilitation.

3.4.2 Project Objectives

Section 15124 of the CEQA Guidelines indicates that the EIR project description shall include a statement of the objectives sought by the Proposed Project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project.

The objectives of the Proposed Project are as follows:

1. Address identified deficiencies in the NCP conditions in order to maintain full system functioning without interruption, in order to protect water supply reliability and service to the City's customers.

2. Improve long-term reliability of the City's water supply infrastructure between Loch Lomond Reservoir and the GHWTP such that it can continue to function as an integral part of the City's overall water supply system.

3. Improve access to the NCP to facilitate inspection, maintenance, and repair of the pipeline system, while minimizing the potential for environmental and propety damage impacts (such as may occur in State Parks and other sensitive areas).

4. Site the NCP to consider constructability, optimize accessibility for maintenance, minimize the potential for future failures due to unstable terrain, and avoid risks (e.g., public safety, property damage) and impacts to adjacent uses associated with pipeline failures during the life of the pipeline.

5. Implement NCP project segments that are cost-effective in terms of both capital and operation/maintenance costs.

3.5 Project Components

3.5.1 Project Overview

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch ductile iron, or polyvinyl chloride (PVC) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), which includes road pavement and unpaved shoulders adjacent to the paved road, and/or existing City easements. Additional easements would be acquired in some locations. In order to focus the environmental review on specific locations along the 8.75-mile pipeline, the alignment was separated into a northern segment and a southern segment; these segments were further delineated into specific sections as described below.

The proposed northern NCP segment from the Newell Creek Access Road Bridge to the FBPS generally follows the existing NCP alignment. The proposed southern NCP segment from the FBPS to the GHWTP generally includes a new pipeline section along Graham Hill Road, except the existing pipe would be removed and replaced in the southern part of the pipeline alignment. Figure 3-4 provides an overview of the proposed NCP alignment. Other components of the Proposed Project include cathodic protection and installation and/or replacement of minor appurtenances, such as air release valves and isolation valves. Key features of the Proposed Project are summarized in Table 3-1 and further described in Section 3.5.2. Pipe sections within the northern and southern segments are shown on Figures 3-5A and 3-5B, respectively.

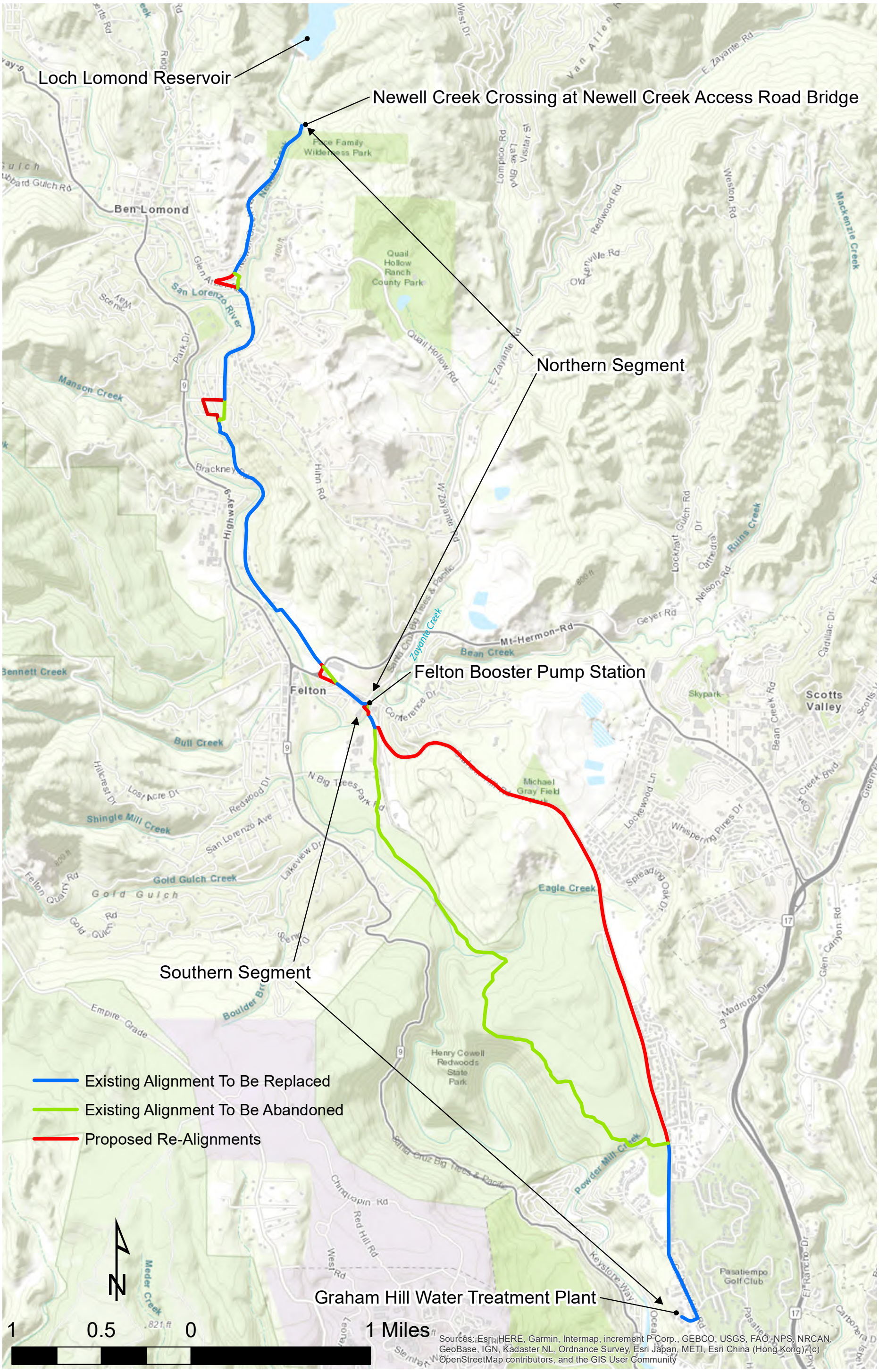
Table 3-1. Key Proposed Project Features

Project Feature	Northern Segment Newell Creek Road to FBPS	Southern Segment FBPS to GHWTP
Alignment Length (feet)	21,838	23,745
Number of Creek or River Crossings	3	1
Maximum Elevation (feet above mean sea level [AMSL])	392	727

Source: HDR 2019a.

Once the new pipeline is installed and the interconnections are made, the existing NCP generally would be abandoned in place and above-ground appurtenances would be removed; see Section 3.5.2, Description of Pipeline Segments, for further details. Generally, all above-ground features of the existing pipeline would be removed including air valves, hydrants, and vent pipes.

Three pipeline sections have been prioritized for replacement in the near term: two sections along Graham Hill Road, comprising the entire southern segment that would replace the existing pipe through Henry Cowell Redwoods State Park, and the Brackney North section in the northern segment. The engineering design phase for these sections is underway. For the remainder of the pipeline alignment, a conservative project scenario is assumed, which includes installation of the new pipeline within specified construction disturbance corridors as identified in Section 3.5.2.



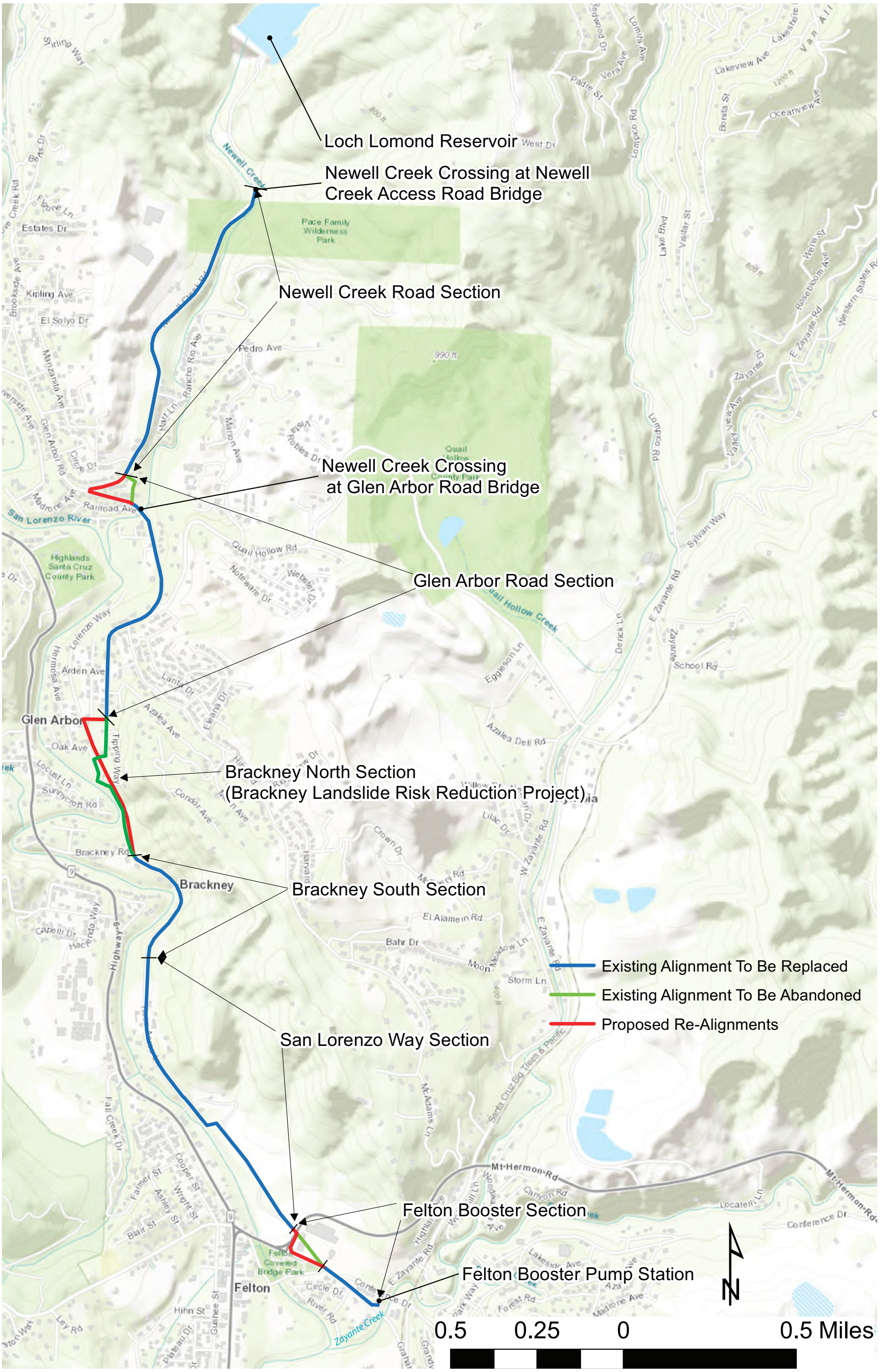
SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3-4

Proposed Newell Creek Pipeline Improvement Project Alignment Overview

Newell Creek Pipeline Improvement Project

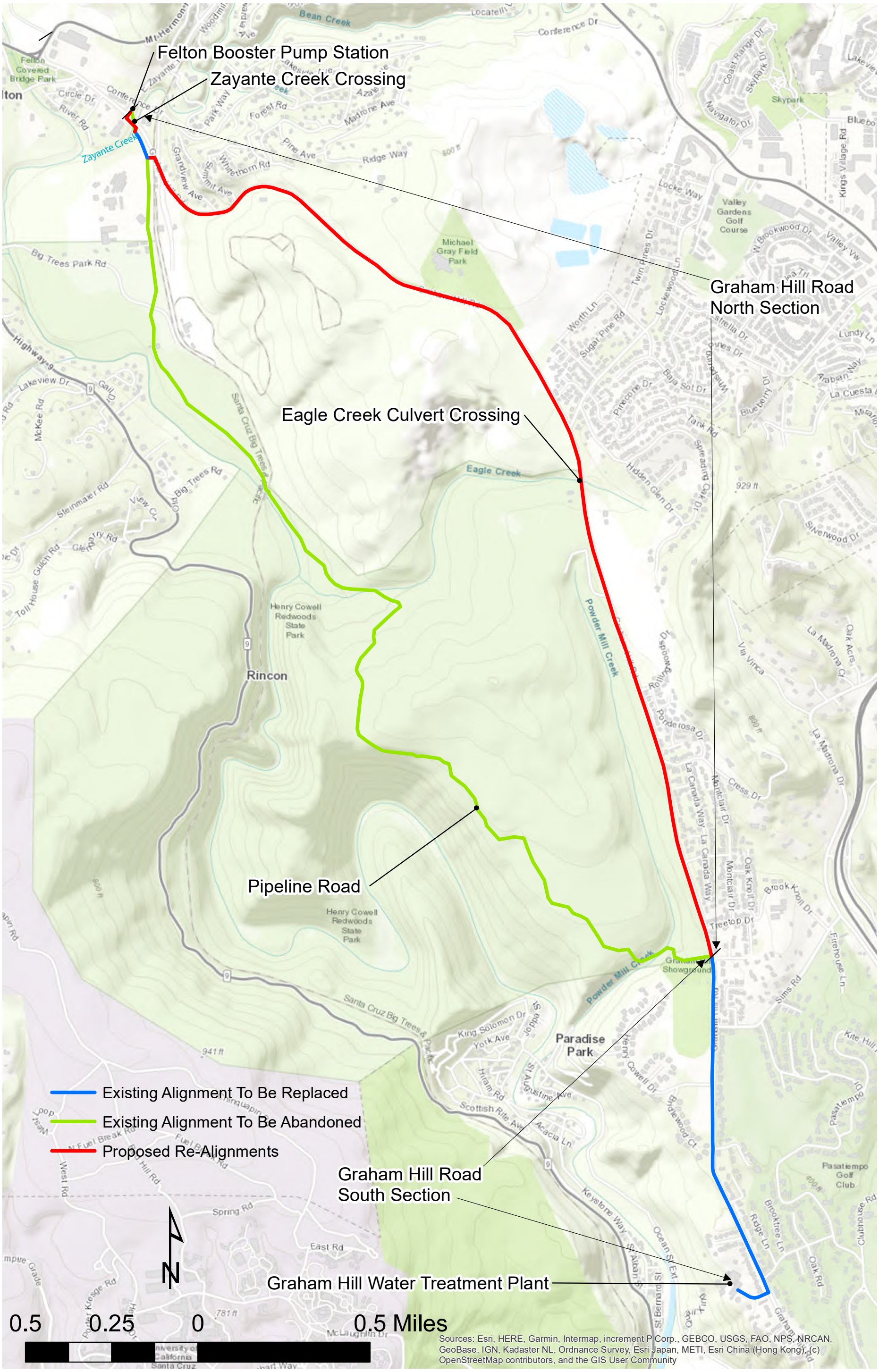
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SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3-5A

Proposed Newell Creek Pipeline Improvement Project Northern Segment



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3-5B

Proposed Newell Creek Pipeline Improvement Project Southern Segment

Newell Creek Pipeline Improvement Project

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Standard construction practices would be implemented by the City or its contractors during construction of the Proposed Project to avoid or minimize erosion and water quality degradation, protect sensitive species and habitat, reduce potential impacts to cultural resources, and reduce air quality and noise impacts. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements.

3.5.2 Description of Pipeline Segments

3.5.2.1 Northern Segment

The northern segment of the proposed NCP is planned within the same alignment as the existing pipeline with minor realignments to avoid private properties in some locations as shown on Figure 3-5A and on subsequent figures of each pipeline section. There are six distinct sections that comprise the northern segment as summarized in Table 3-2 and shown on Figure 3-5A.

Table 3-2. Proposed Project Northern Segment Summary

Section	Section Length (feet)	Pipeline Corridor Width (feet)[1]	Description[2]
Newell Creek Road	5,035	60-100 Open cut trench	Runs along Newell Creek Road from the Newell Creek Access Road Bridge to the intersection where the pipeline passes between homes and connects at Glen Arbor Road. *Creek Crossing: Newell Creek*
Glen Arbor Road	5,120	40-100 Open cut trench	Continues along Newell Creek Road turning onto Glen Arbor Road, crossing Newell Creek, turning onto Hermosa Ave, Oak Ave, and Fremont Ave to north end of Brackney. *Creek Crossing: Newell Creek*
Brackney North (Brackney Landslide Area Pipeline Risk Reduction Project)	2,611	10[3] Trenchless	Runs along an abandoned railroad bed alongside the San Lorenzo River between a Glen Arbor Road neighborhood and the Brackney Road neighborhood.
Brackney South	2,860	10 Open cut trench and/or trenchless	Extends from Brackney North section, partially along unpaved easement and paved road and ends at a property boundary at north end of San Lorenzo Way/Rose Acres Lane.
San Lorenzo Way	4,242	10 Open cut trench	Runs from north to south end of San Lorenzo Way/Rose Acres Lane and through private property to the edge of Mount Hermon Rd. *Creek Crossing: Unnamed ephemeral creek that is tributary to San Lorenzo River*
Felton Booster Pump Station	1,970	60-120 Open cut trench	Runs along Mount Hermon Road and Graham Hill Road to FBPS.
Total	**21,838**		

[1] Includes area in which new pipeline could be located and area of disturbance during pipeline installation. Construction method is identified.
[2] Sections where pipeline crosses a creek are noted.
[3] Pipeline location specified in 30% design plans. City intends to acquire permanent 20-foot easement..
Source: HDR 2020,

The new pipeline would be installed within existing roadways, road ROWs, and/or City easements. The northern segment has a maximum surface elevation of approximately 392 feet AMSL, would gravity flow to the FBPS, and has two creek crossings over Newell Creek and one crossing over an unnamed tributary to San Lorenzo River. Three short sections of pipe are currently located within private property and would be rerouted as described below. Further description for each section is provided below.

Newell Creek Road Section

The northernmost pipeline section, Newell Creek Road, extends 5,035 feet within Newell Creek Road or ROW. This section begins on the north/upstream side of the bridge crossing of Newell Creek (Newell Creek Access Road Bridge), crosses Newell Creek and follows Newell Creek Road to Glen Arbor Road. The existing pipeline is located on the Newell Creek Access Road Bridge and is planned to be removed and replaced with the new pipe in either the same location or on the downstream side of the bridge. The alignment begins in a rural setting at the Newell Creek Access Road Bridge and transitions into residential neighborhoods before connecting to Glen Arbor Road on the south. The Proposed Project would place the new pipeline entirely within the 60- to 100-foot wide road ROW, and generally within the existing road pavement as shown on Figure 3-6.

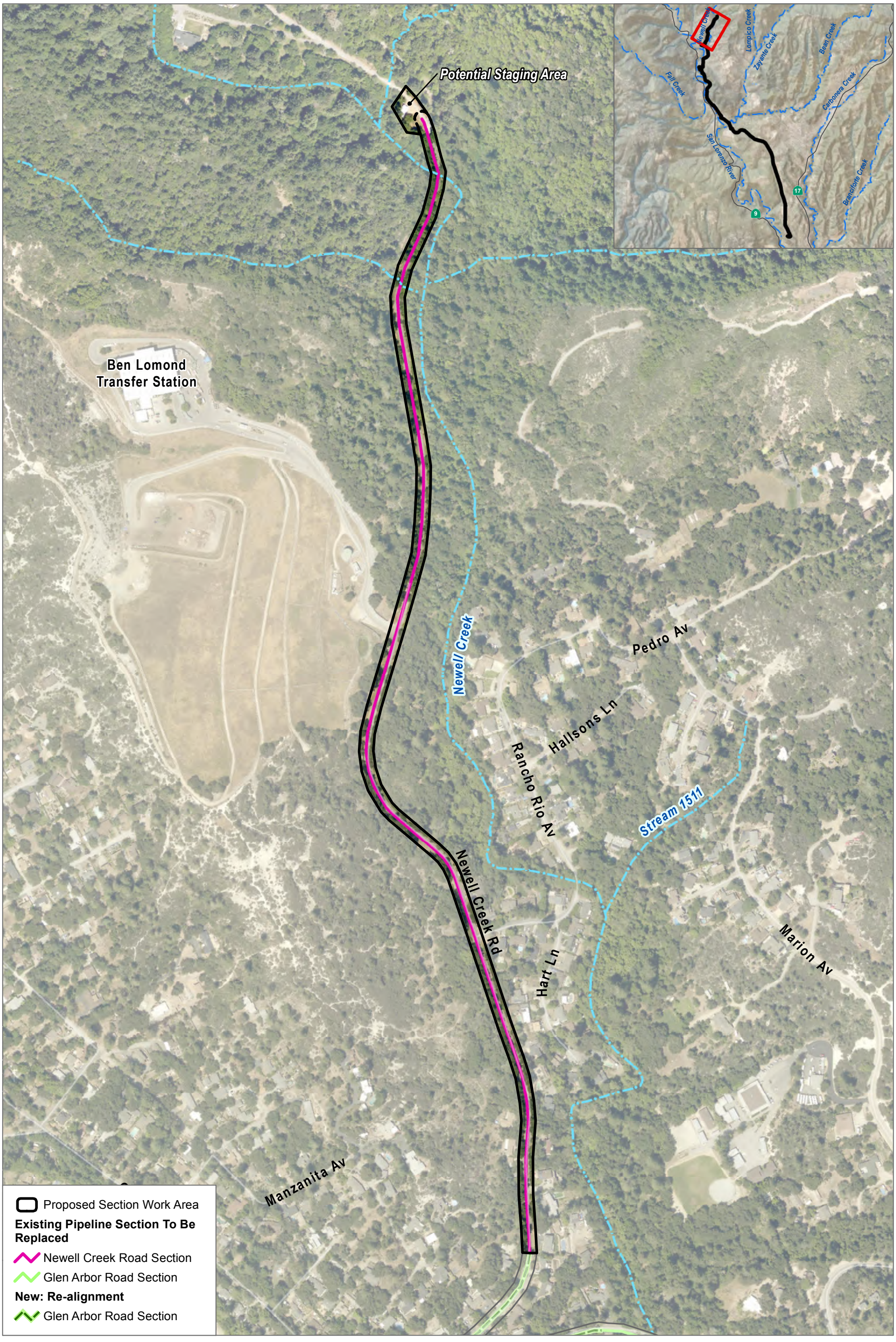
Glen Arbor Road Section

The Glen Arbor Road section extends 7,120 feet within public road ROWs. The existing pipeline crosses through private property from Newell Creek Road to Glen Arbor Road, where it again crosses Newell Creek and continues along Glen Arbor Road and onto Caledonium Avenue. The existing pipeline also crosses private property at the southern terminus of Caledonium Avenue, where it jogs across to Fremont Avenue before continuing southward to the Brackney Road neighborhood. The Proposed Project would avoid the private property between Newell Creek Road and Glen Arbor Road and place the new pipeline entirely within the 40- to 100-foot wide public road ROW, and generally within the existing road pavement of both roads as shown on Figure 3-7. Additionally, the Proposed Project would avoid the private property between Caledonium and Fremont Avenues by realigning the pipe within the public road ROWs of Glen Arbor Road and Schaaf Road.

Brackney North Section

The Brackney North pipeline section extends approximately 2,610 feet between Glen Arbor Road, Schaaf Road and Brackney Road as shown on Figure 3-8. The majority of the pipeline would be a single fused pipeline of fusible polyvinyl chloride (FPVC) or HDPE, which would be installed using a horizontal directional drilling (HDD) trenchless method. Generally, the HDD method consists of a guided and steered trenchless construction technique to install the pipe into the subsurface as further described in Section 3.6.2.2. The pipe would be installed at depths of approximately 80 to 100 feet.

Installation of the Brackney North pipe section also will include open cut trench construction for approximately 720 linear feet within a 4-foot wide trench. Open trench construction would occur at the north tie-in along Schaaf to Glen Arbor to Caledonium, and also at the south tie-in. Acquisition of additional permanent and temporary construction easements or property would be required.



SOURCE: Bing 2021: County of Santa Cruz 2021

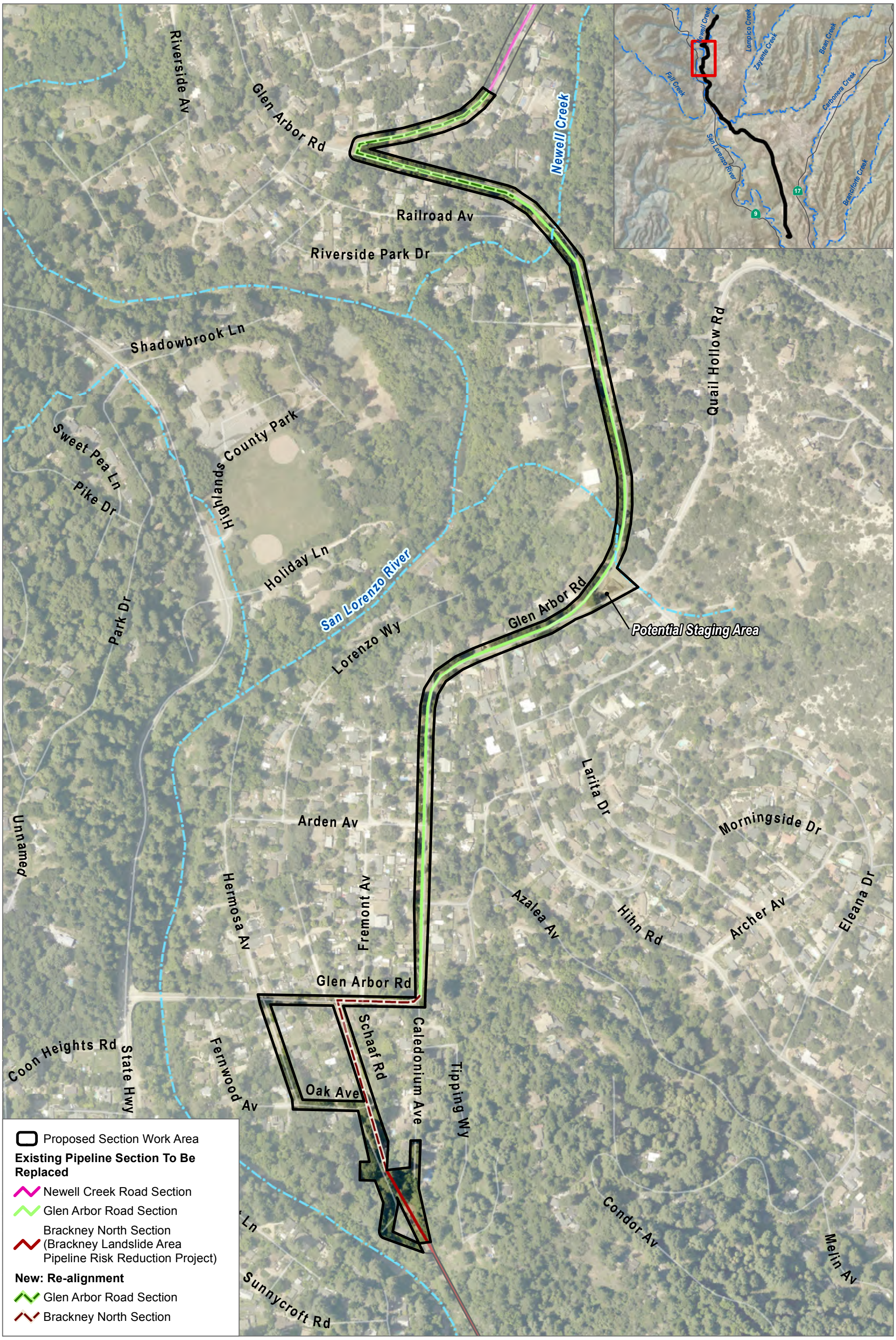
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0 185 370 Feet

FIGURE 3-6

Proposed Newell Creek Road Pipeline Section Alignment

Newell Creek Pipeline Improvement Project



SOURCE: Bing 2021: County of Santa Cruz 2021

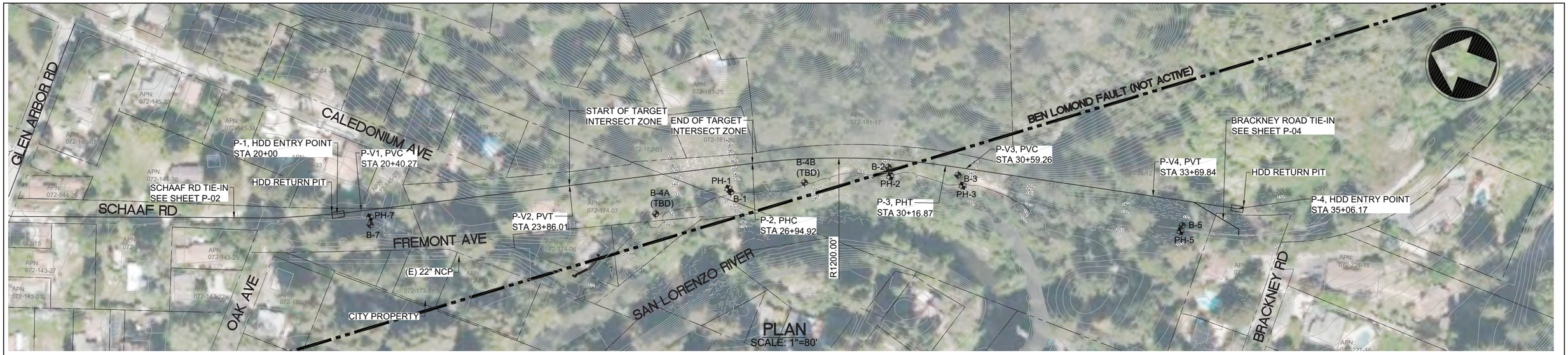
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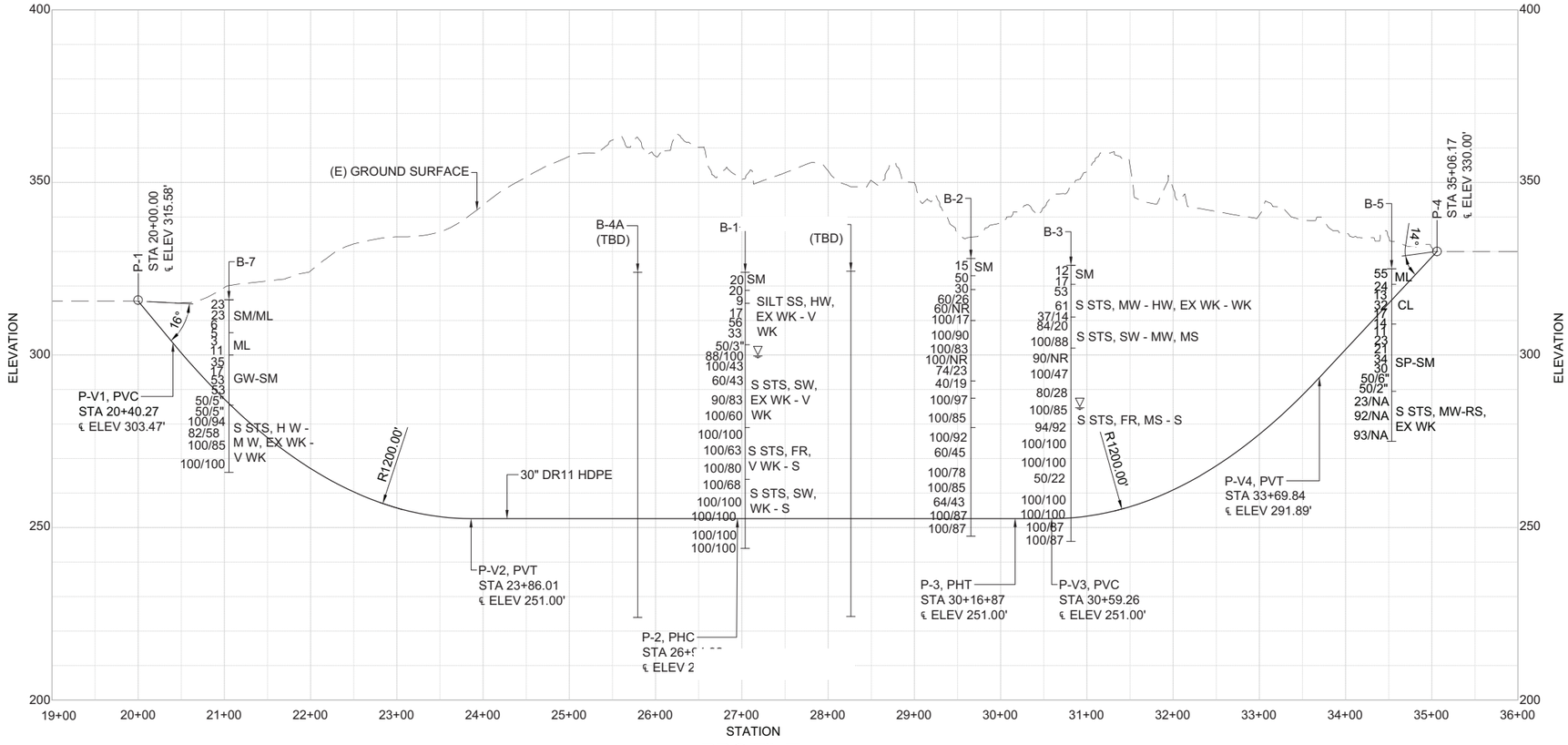
0 180 360 Feet

FIGURE 3-7

Proposed Glen Arbor Road Pipeline Section Alignment

Newell Creek Pipeline Improvement Project





SOURCE: Mott MacDonald 2021

FIGURE 3-8

Proposed Brackney North Pipeline Section Alignment

Newell Creek Pipeline Improvement Project

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This section traverses a steeply sloped area. The topography west of the easement slopes steeply downwards to the San Lorenzo River, and to the east, existing topography slopes steeply upwards. The section also is within an area of known landslides. The existing pipeline easement is generally level longitudinally, but is benched into a steep cross slope. The existing pipeline extends south from Fremont Avenue within a gravel driveway alongside an existing residence and continues south along a dirt road within the City's 10-foot easement to Brackney Road (Mott MacDonald 2021a).

Brackney South Section

The Brackney South section extends approximately 2,860 feet within a 10-foot wide City easement, partially unpaved and partially within road pavement. The section extends from the Brackney North section to San Lorenzo Way. The San Lorenzo River is located adjacent to portions of this section on the west. The Brackney South section ends at the property boundary near the northern intersection of San Lorenzo Way and Rose Acres Lane. The Proposed Project would result in installation of a new pipeline within the existing City 10-foot easement as shown on Figure 3-9.

The potential for deeper-seated landslides exists in the Brackney South section through most or all of the soil mass above the bedrock.. Construction of a cantilevered retaining wall is being considered for a portion of the Brackney South section, which would help prevent potential slides from moving downslope; see also discussion in Section 3.6.2.3. Installation may also occur with directional drilling or conventional open trench methods.

San Lorenzo Way Section

The San Lorenzo Way section extends approximately 4,242 feet south from San Lorenzo Way/Rose Acres Lane within a 10-foot wide City easement through private property. The San Lorenzo River is located adjacent to portions of this section on the west, and the pipeline crosses an unnamed creek. This pipe section ends at Mount Hermon Road. The Proposed Project would result in installation of a new pipeline within the existing City 10-foot easement as shown on Figure 3-10.

Felton Booster Pump Station Section

The Felton Booster Pump Station section extends 1,970 feet from Mount Hermon Road at Graham Hill Road to the FBPS. A portion of this section has been re-aligned to avoid passing through the parking lot of Felton Fair Shopping Center where the current pipeline is located. The proposed pipeline would be installed within Mount Hermon Road and Graham Hill Road, ending at the FBPS as shown on Figure 3-11.

3.5.2.2 Southern Segment

The southern segment of the proposed NCP extends from the FBPS to the GHWTP. This segment generally consists of the installation of a new 24-inch pipeline within easements and Graham Hill Road from the FBPS to Pipeline Road, and replacement of the southernmost section of existing pipeline located in Graham Hill Road from Pipeline Road to GHWTP (refer to Figure 3-12).

The southern segment is comprised of two sections, Graham Hill Road North and South. These two sections are discussed below, summarized on Table 3-3, and shown on Figure 3-5B. The paved roadway width of Graham Hill Road varies between 28 and 40 feet in a 40- to 100-foot wide County ROW. This alignment would

realign the portion of the existing NCP which passes through the San Lorenzo Lumber Yard, as well as the existing Pipeline Road sections through Henry Cowell Redwoods State Park into Graham Hill Road (see Figure 3-2).

Table 3-3. Proposed Project Southern Segment Summary

Segment Section	Section Length (feet)	Pipeline Corridor Width (feet)[1]	Description[2]
Graham Hill Road North	17,880	40-100[3] Open cut trench (except for creek crossing)	From FBPS, crosses Zayante Creek, runs alongside Graham Hill Road, crosses rail road tracks entering Graham Hill Road and follows Graham Hill Road to southern entrance of Henry Cowell Redwoods State Park *Creek Crossing: Zayante Creek* *Railroad Crossing*
Graham Hill Road South	5,865	65-120[3] Open cut trench	Follows Graham Hill Road from southern entrance of Henry Cowell Redwoods State Park to GHWTP.
Total	**23,745**		

[1] Includes area in which new pipeline could be located and potential construction area of area of disturbance during pipeline installation. Construction method is identified.
[2] Sections where pipeline crosses a creek are noted.
[3] Pipeline location specified in 30% design plans
Source: HDR 2020.

The southern segment has a maximum elevation of approximately 727 feet AMSL, one creek crossing at Zayante Creek and two culverted creek crossings (Eagle Creek and Powder Mill Creek). The existing Graham Hill Road bridge crossing over Zayante Creek has a 3-foot-wide raised pedestrian crossing on one side of the bridge; the existing Felton Diversion pipeline crossing is located just west of the bridge on abandoned railroad abutments (HDR 2020).

Graham Hill Road North Section

The proposed Graham Hill Road North section extends 17,880 feet (approximately 3.4 miles) south from the FBPS to the Graham Hill Road intersection with Pipeline Road. The first portion of the proposed pipeline would extend across Graham Hill Road and over Zayante Creek adjacent to the City's Felton Diversion Pipeline (see Figure 3-13). The proposed pipeline would then be installed in the City's existing 20-foot wide easement, which also contains the existing pipeline within an unpaved, approximately 12-foot-wide path (see Figure 3-14). The proposed pipeline would cross the Santa Cruz Big Trees and Pacific Railway existing rail tracks via a trenchless method to Graham Hill Road (see Figure 3-15), where it would be installed within the Graham Hill Road pavement, primarily on the eastern side of the road. A representative site plan of the Graham Hill Road North section is shown on Figure 3-16. Further details regarding construction methods across Zayante Creek and the existing rail tracks are presented in Sections 3.6.2.4 and 3.6.2.5, respectively.



SOURCE: Bing 2021: County of Santa Cruz 2021

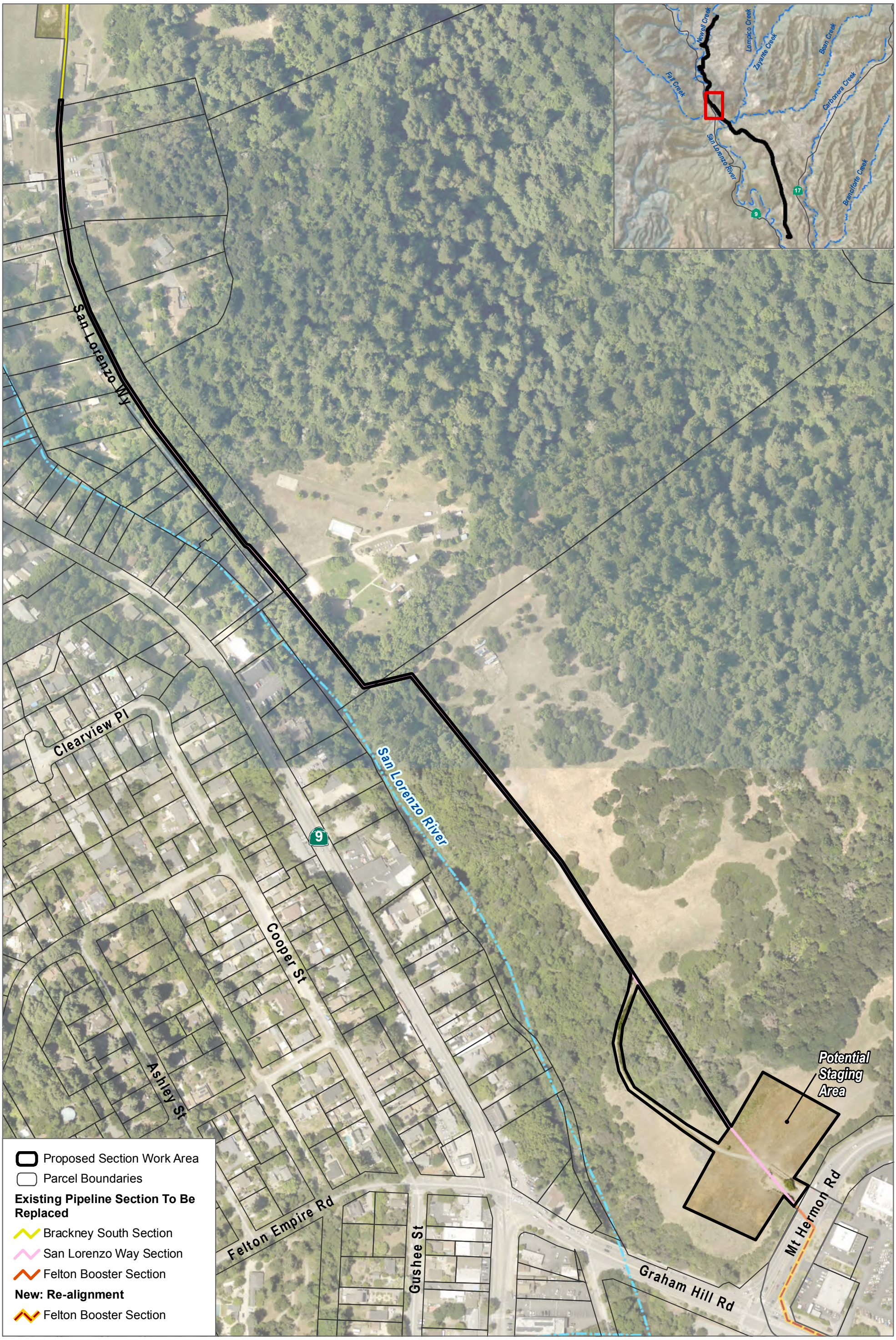
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0 105 210 Feet

FIGURE 3-9

Proposed Brackney South Pipeline Section Alignment

Newell Creek Pipeline Improvement Project



SOURCE: Bing 2021: County of Santa Cruz 2021

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0 135 270 Feet

FIGURE 3-10

Proposed San Lorenzo Way Pipeline Section Alignment

Newell Creek Pipeline Improvement Project



SOURCE: Bing 2021: County of Santa Cruz 2021

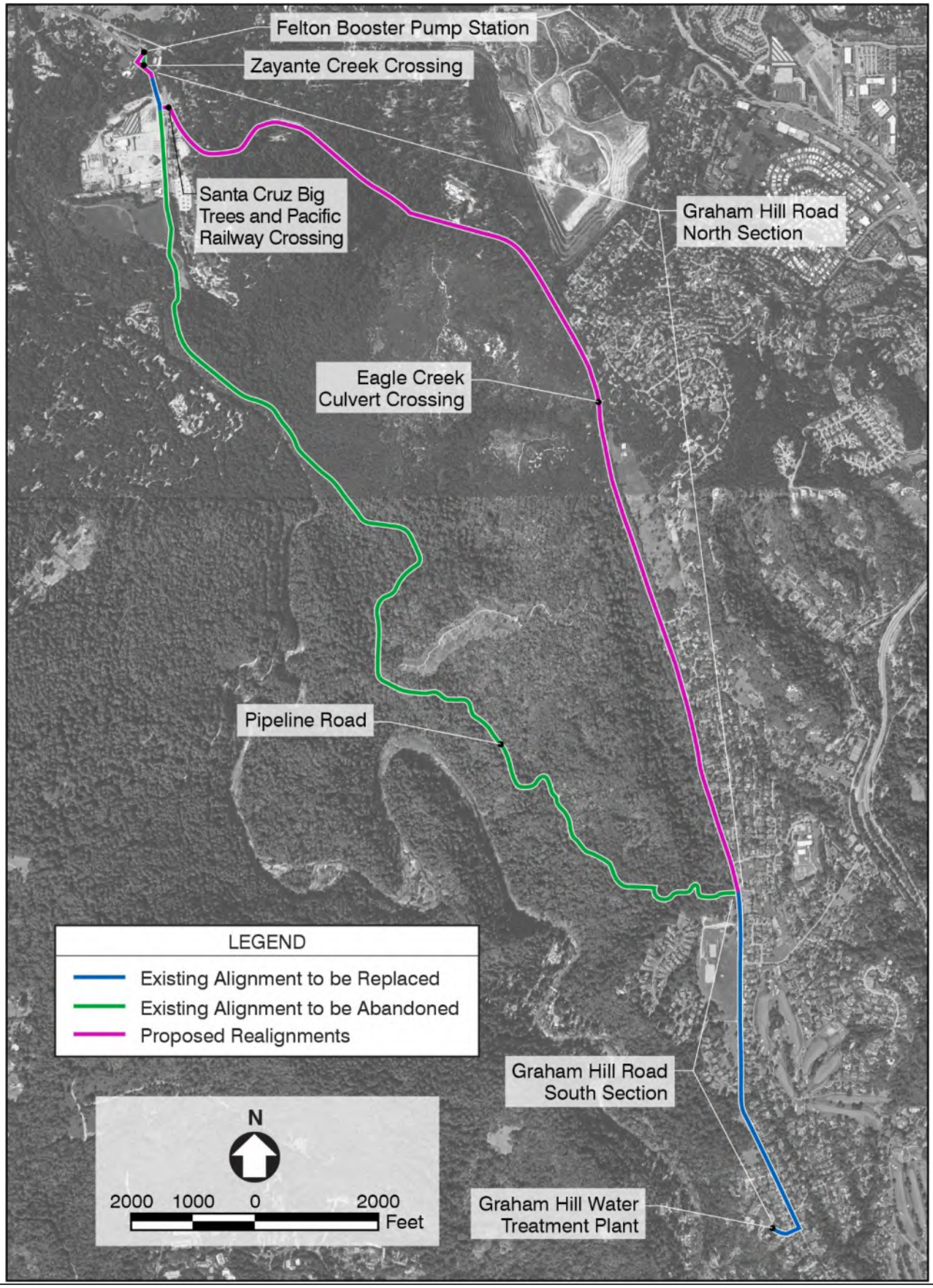
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0 80 160 Feet

FIGURE 3-11

Proposed Felton Booster Pipeline Section Alignment

Newell Creek Pipeline Improvement Project



SOURCE: Carollo 2021

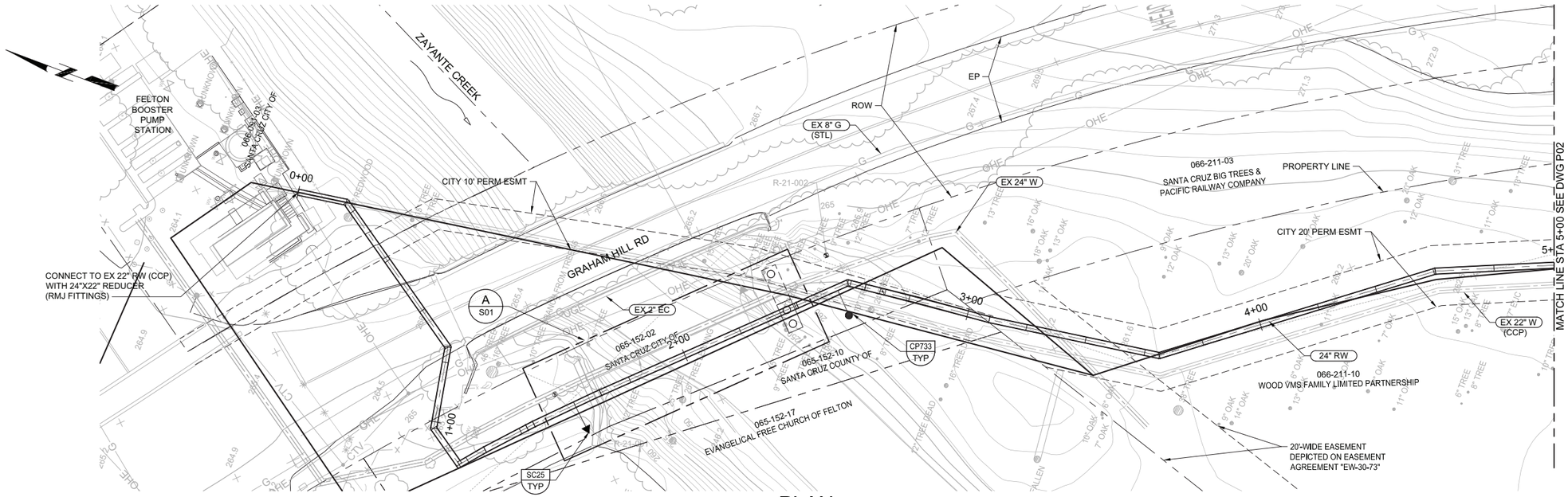
FIGURE 3-12

Graham Hill Road Pipeline Sections Overview

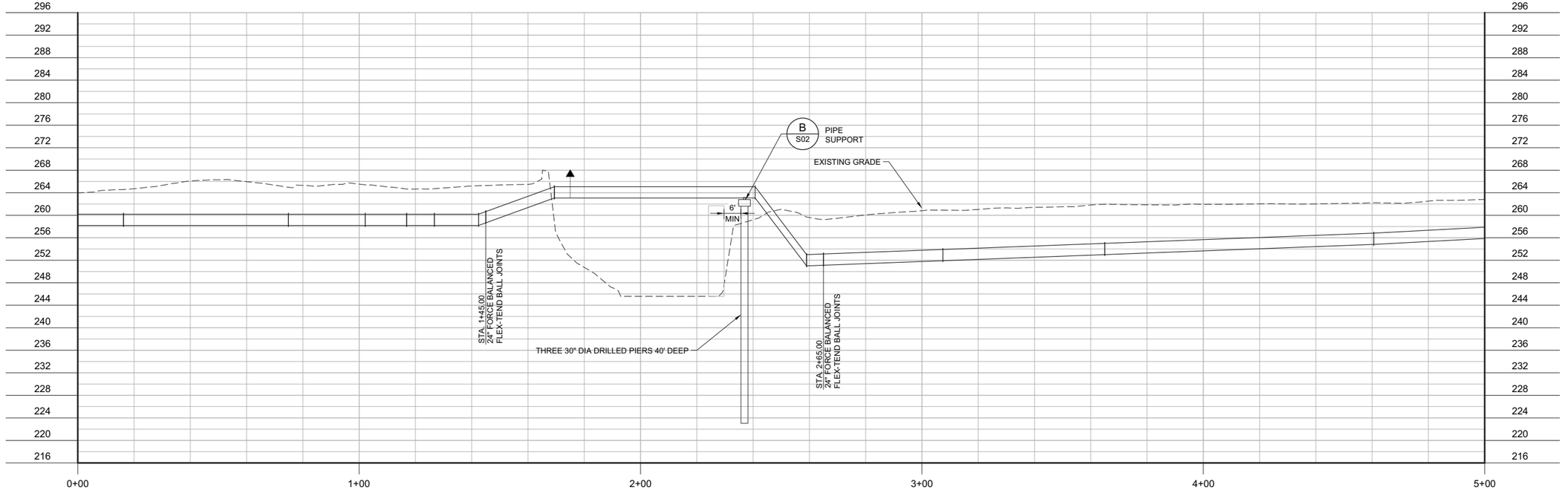
Newell Creek Pipeline Improvement Project

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PLAN



PROFILE

SOURCE: Carollo 2021

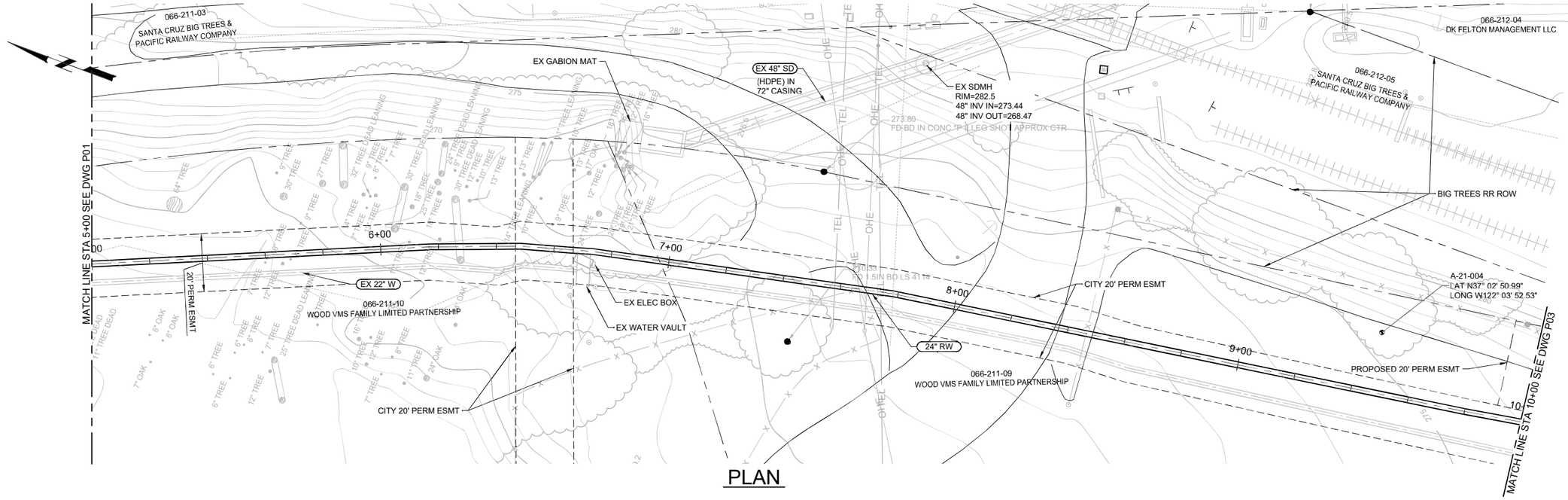
FIGURE 3-13

Graham Hill Road North Pipeline Section Site Plan - Zayante Creek Area

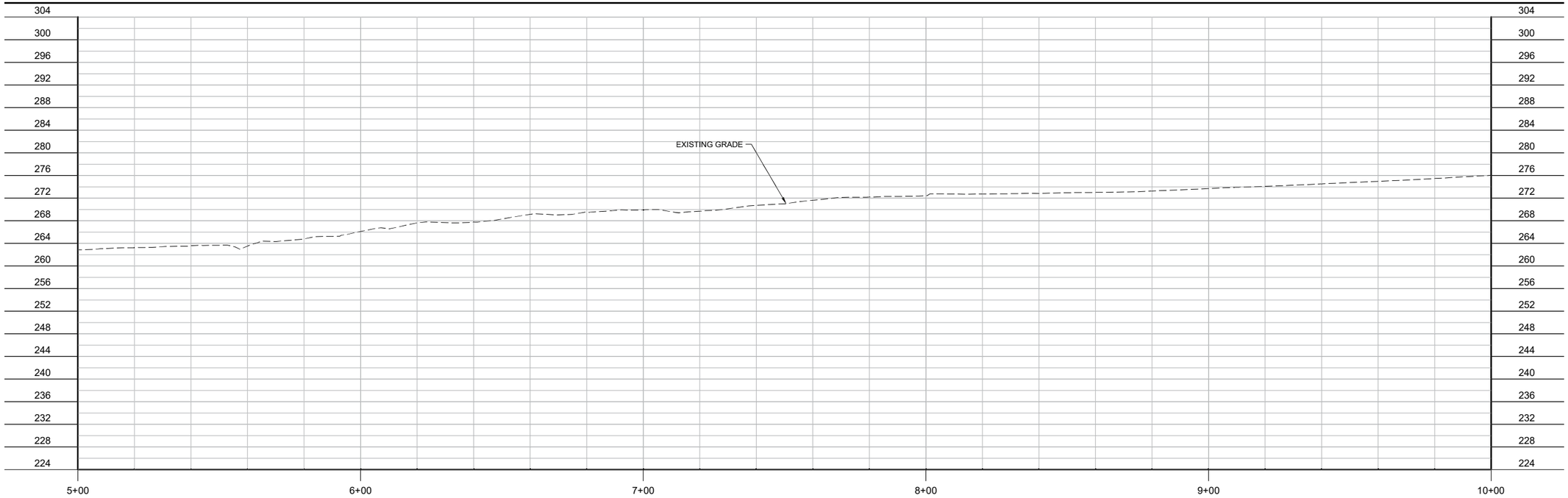
Newell Creek Pipeline Improvement Project

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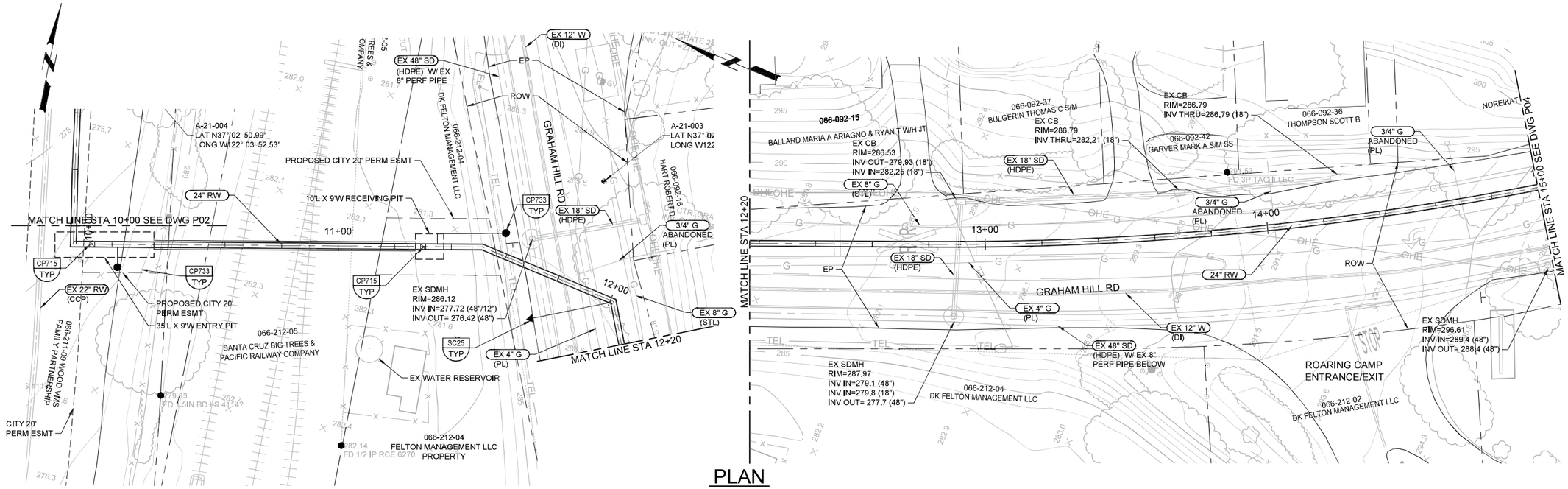
SOURCE: Carollo 2021

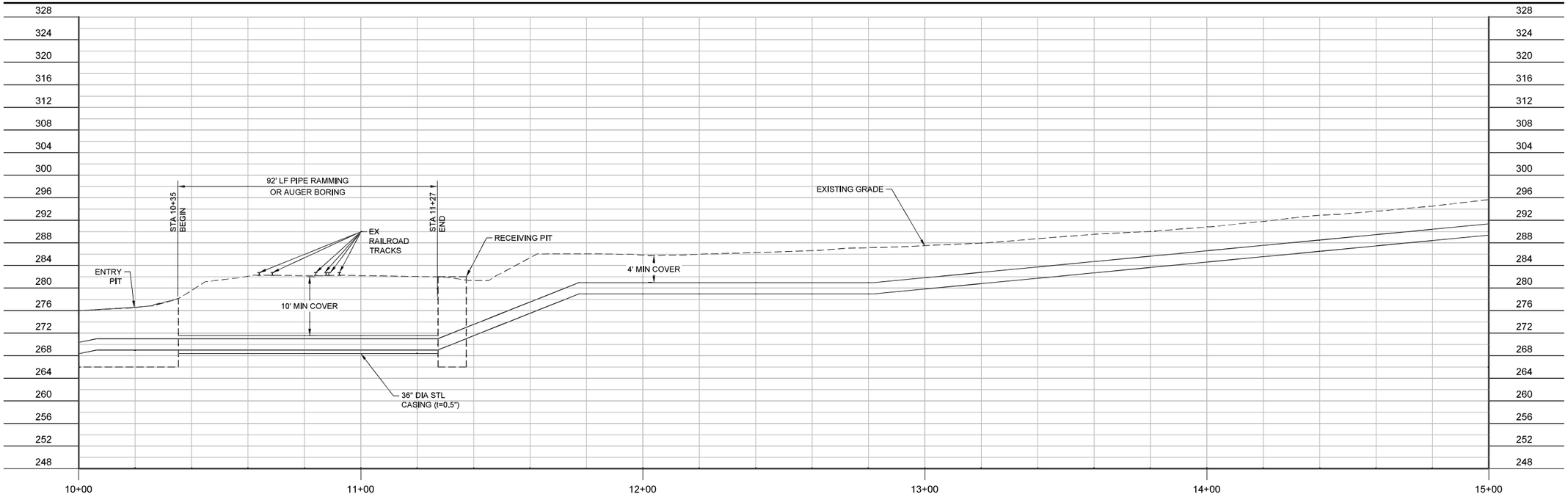
FIGURE 3-14

Graham Hill Road North Pipeline Section Site Plan - City Easement Area

Newell Creek Pipeline Improvement Project

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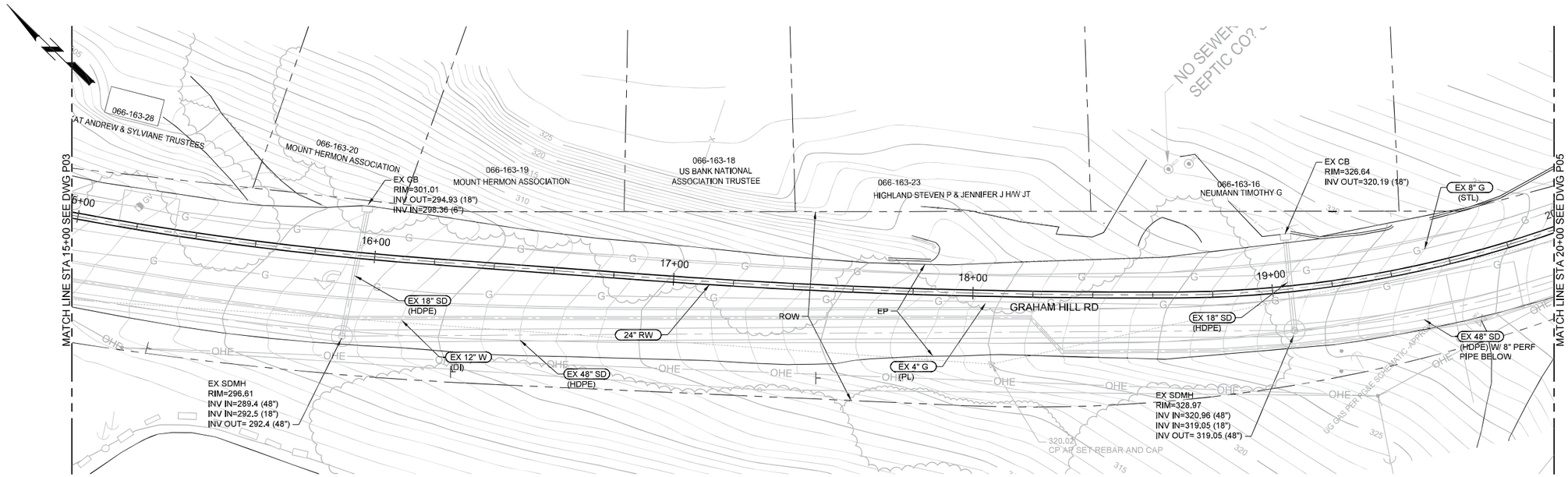
SOURCE: Carollo 2021

FIGURE 3-15

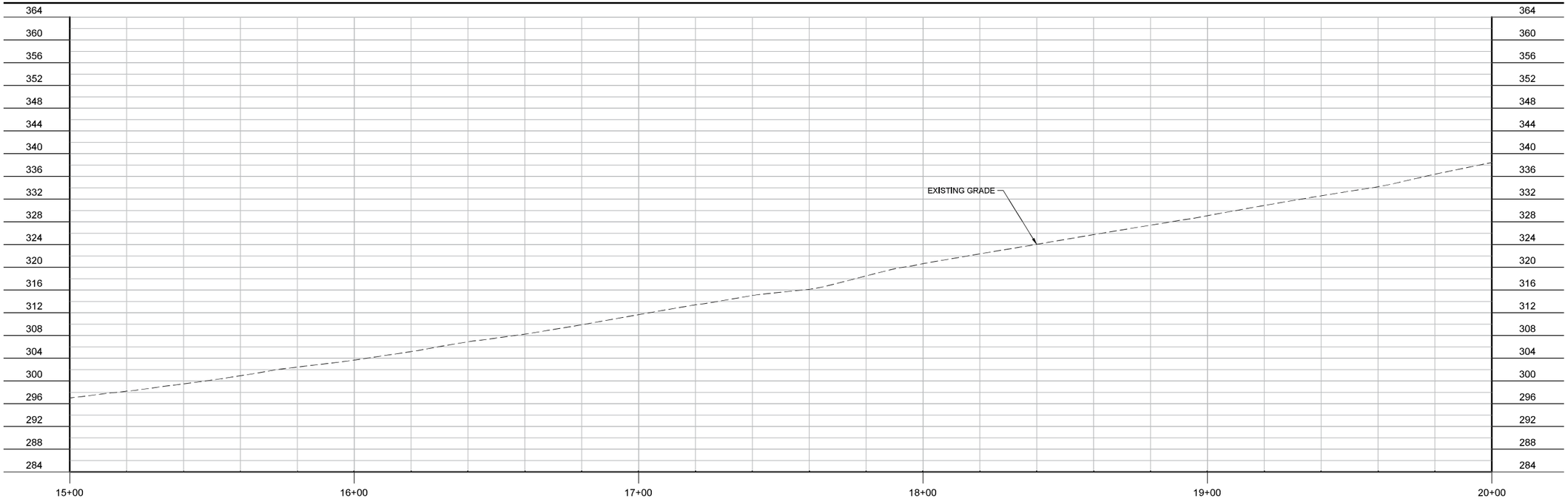
Graham Hill Road North Pipeline Section Site Plan - Rail Crossing

Newell Creek Pipeline Improvement Project

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PLAN



PROFILE

SOURCE: Carollo 2021

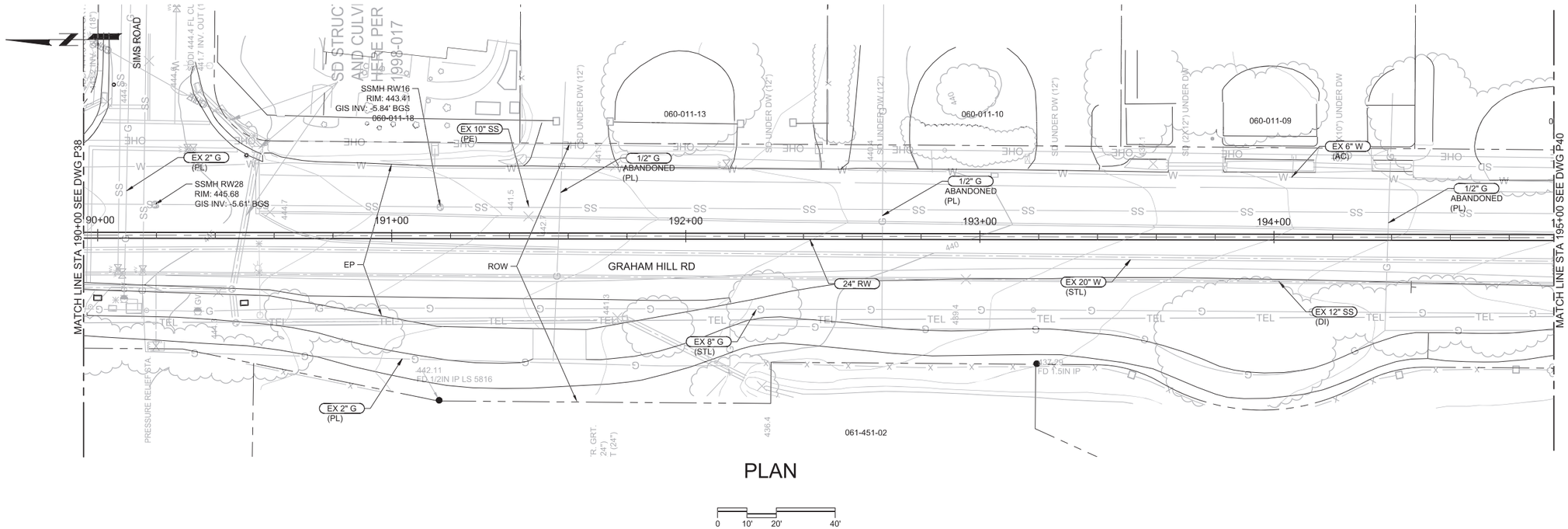
FIGURE 3-16

Graham Hill Road North Pipeline Section Site Plan - Representative Road Area

Newell Creek Pipeline Improvement Project

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PLAN

0 10' 20' 40'

SOURCE: Carollo 2021

FIGURE 3-17

Graham Hill Road South Pipeline Section Site Plan - Representative Road Area

Newell Creek Pipeline Improvement Project

DUDEK

Path: Z:\Projects\CarolloSantaCruz_AsNeeded\122672\MAP\DOCDOC\MENTER\3_ProjectDescription

Graham Hill Road South Section

This section extends 5,865 feet along Graham Hill Road from its intersection at Pipeline Road south to the GHWTP. The southern approximately 3,600-linear feet of this pipeline would entail removal of the existing NCP and installation of the new pipeline in the current NCP location, which is generally near the center or eastern side of the existing paved road. In this location, it is necessary to use the existing NCP alignment due to presence of other utilities in the roadway. A representative site plan of the Graham Hill Road North section is shown on Figure 3-17.

3.5.3 Other Project Components

3.5.3.1 Appurtenances and Improvements

Other components of the Proposed Project include installation of air release valves, isolation valves, blowoffs and other appurtenances that would be designed in accordance with City and American Water Works Association (AWWA) standards. The FBPS has been improved over the past decade, and no new pump stations are required. Additionally, cathodic protection would be implemented during pipeline installation.

New air valves will be required in new pipeline sections to manage air and vacuum conditions occurring in the pipeline. Releasing air is required when filling the pipeline and during normal operations. Combination air release valves and air/vacuum valves typically would be installed along the pipeline at 1/4 to 1/2 mile intervals. The air valves generally extend approximately 24 inches above ground and are anticipated to be approximately two-inch diameter size valves to accommodate pipeline filling (Carollo 2021). However, an 8-inch valve is proposed at the high point in the pipeline off of Graham Hill Road near the County Juvenile Center with three 2-inch valves are proposed at 300, 600, and 800 feet upstream of the high point per the recommendations of a surge analysis completed for the project. Isolation valves would be installed at strategic locations to facilitate isolating the pipeline into segments if dewatering as a result of pipeline maintenance or repair the pipeline was ever needed in the future. The isolation valves would be installed below ground with a valve box lid at the ground surface, flush with grade.

Blowoffs will be provided at selected low points and on the uphill side of isolation valves to facilitate pipeline dewatering. Blowoffs may also be used to maintain water quality during low flow conditions by opening the blowoff to flush aged water. Blowoffs would be located near sanitary sewer manholes, where feasible, to facilitate convenient disposal of water (Carollo 2021). Blowoffs would be located only at low points and at isolation valves and may be used to drain the pipe for maintenance or repairs. Blowoffs will look very similar to isolation valves with a valve box lid at the surface, flush with grade

3.5.3.2 Post-Construction Revegetation/Restoration

Upon completion of construction, construction sites would be revegetated and/or restored in accordance with the City's Standard Construction Practices, and disturbed roadways would be repaved in accordance with County requirements.

3.5.3.3 Decommissioning of Existing Pipeline

Once the new NCP pipeline sections are installed and operational, the remaining existing pipeline sections would be decommissioned. This would involve capping off the existing pipeline, injecting the pipeline with grout, and abandoning in place. All existing pipe sections under roadways/travelways would be grouted with plugging or capping where the pipeline goes cross-country through flat areas. Generally, all above-ground features of the existing pipeline would be removed including air valves, hydrants, and vent pipes.

Approximately 13,200 linear feet of the existing NCP is within the paved Pipeline Road in Henry Cowell Redwoods State Park, except for 4,600 linear feet, which is not paved. Certain segments within the State Park are difficult to access due to narrow vehicle clearance, steep roadway grades, and few truck turnaround locations. In locations that are difficult to access, pipe segments would be plugged every 1,000 feet and/or where there are surface access points. Where the existing NCP is exposed and adjacent to a roadway bridge that crosses above a tributary stream to the San Lorenzo River, removal of the pipe segment presents risk of depositing sediment and debris into the stream. In addition, the pipe in this area is supporting the road crossing. In this location, the pipe segment would be cut at each end where it daylights, and concrete and rebar reinforcement would be installed to prevent impacts from abandonment activity and to increase longevity of the road.

3.5.4 Operations and Maintenance

After installation of the Proposed Project, operations would include continued implementation of pump start-up and valve operations at the FBPS, when needed to pump water to/from Loch Lomond Reservoir. Once installed, maintenance of the pipeline would include intermittent, periodic inspections and maintenance of air valves with access provided to the pipeline sections by existing roads and easements. The Brackney North pipeline section would have air valves on either end of the new pipeline and would not need to be accessed in the future unless replacement is necessary (HDR 2020).

3.6 Project Construction

This section describes the anticipated Proposed Project construction schedule, expected construction methods, construction routes and staging, estimated construction equipment and workers, and the City's Standard Construction Practices that are incorporated into the Proposed Project.

3.6.1 Construction Schedule

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately late 2022/early 2023 to 2032. The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first, with an estimated construction schedule of about 24 months for the Graham Hill Road sections and approximately 9 months for the Brackney North section, including pipeline installation, road repaving, abandonment of the existing NCP, and post-construction revegetation where needed. The remaining pipe sections in the northern segment are expected to be constructed by 2032. A summary of the planned construction schedule for each pipe sections is presented in Table 3-4.

Table 3-4. Project Construction Assumptions

Pipeline Section	Estimated Schedule[1] / Total Work Days	Estimated Daily Workers	Construction Equipment
Newell Creek Road	March-June 2030 / 66 total work days	12	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, rollers, paving equipment
Glen Arbor Road	June-October 2030 / 94 total work days	12	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, rollers, paving equipment
Brackney North	-March-December 2023 / 306 total work days	8	Excavator, tractors, loaders, backhoes, dumpers, mud pumps, HDD drill rig, mud separation plant, forklift, dump truck, vacuum truck, water truck, welding truck, generators, flood lights, fusion machine, pavers, rollers, paving equipment, concrete mixer truck
Brackney South	March-May 2031 / 51 total work days	12	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, rollers, paving equipment
San Lorenzo Way	May-July 2031 / 55 total work days	12	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, rollers, paving equipment
Felton Booster Pump Station	July-September 2031 / 47 total work days	12	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, rollers, paving equipment
Graham Hill North	January 2023-July 2024 / 334 total work days	11-18	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, dumpsters, boring machine, bore/drill rigs, cranes, plate compactors, cement and mortar mixers, rollers, paving equipment, off-highway trucks
Graham Hill South	July 2024-February 2025 / 137 total work days[2]	11-18	Excavator, tractors, loaders, backhoes, concrete/industrial saws, pavers, dumpsters, mixers, rollers, paving equipment, off-highway trucks, cement and mortar mixers,

[1] Includes post-construction road repaving, abandonment of existing pipeline, revegetation and construction demobilization.

[2] Includes 50 work days at end of Project construction to abandon existing pipeline in Henry Cowell Redwoods State Park between December 2024 and February 2025.

Source: Carollo Engineers for Graham Hill Road North and South; Mott Macdonald for Brackney North; Santa Cruz Water Department for all others.

3.6.2 Construction Methods

The majority of the Proposed Project would be installed using conventional (open cut) trenching methods, except in the Brackney North and potentially Brackney South sections, as well as under the existing rail crossing in the Graham Hill Road North section, where trenchless methods would be used. Special construction techniques would be utilized at creek crossings, as described below. As indicated in Section 3.5.1, the Proposed Project generally would be constructed within existing road pavement, road ROW and/or existing City easements, except acquisition of additional permanent and temporary construction easements and/or property would be required for the Brackney North section. In accordance with the City's Standard Construction Practices, described in Section 3.6.5, best management practices would be implemented where necessary to prevent erosion and water quality degradation and/or to protect sensitive natural resources.

3.6.2.1 Conventional Trenching Construction Methods

Conventional (open cut) trenching consists of excavation of the trench, removal of the excavated soil ~~via truck~~, installation of the pipe on bedding, and backfilling the trench with engineered fill. It is expected that approximately 60-100 linear feet of pipeline can be installed per work day on average using conventional trenching. Installation of the new pipe in Graham Hill Road will require approval of an encroachment permit and traffic control plan from the County of Santa Cruz, and the City will use the County's standard trench construction detail for installation of the pipe.

The standard pipeline construction trench would be approximately 4 to 5 feet wide with varying depths to avoid existing utilities under paved roadways, but generally would be a minimum of 5 feet deep. Construction activities would be expected to occur within an approximate 10-to 15-foot-wide construction corridor, which includes the area of trenching, temporary road lane closures, and placement of equipment within and adjacent to the work area during the work day. Construction activities would occur within the closed road travel lane and activities that could encroach onto the adjacent roadway unpaved shoulder would include movement of construction workers and equipment, temporary parking and storage of pipeline, and temporary signage that would be used in that day's construction. No excavated or fill soils will be stockpiled on the side of the road. All construction materials, equipment and spoils would be stored at designated staging areas and would not remain along the road after daily construction work periods.

3.6.2.2 Construction Methods in Brackney North Section

The new pipe in the Brackney North section would be installed using the HDD method, which is a guided trenchless construction technique. This method uses a combination of vertical and horizontal curves to install a pipeline from the surface. The alignment is drilled in multiple passes. Following hole enlargement, a carrier pipe is pulled into the excavated hole and drilled to the other end.

Work areas will be needed at both ends of the HDD for the duration of installation. A typical work area required for HDD drill rig operations is an area of approximately 15,000 square feet. The width of work area at the point of pipe entry into the HDD bore is typically 50 feet. The pipe string must be fused into a single pipeline at the pipe entry side, approximately 100 ft longer than the length of the HDD. A laydown area will be required for the pipe string as well as work area(s) for fusion activities (approximately 30 feet wide). A private gravel turnout along Brackney Road would provide the required width to perform pipe fusion. The trenched pipeline construction will utilize the same staging areas as those designated for HDD construction (Mott MacDonald 2021b).

Pipe lifting equipment, such as cranes, would be required at the HDD pipe entry location (near the north end of the pipe string) to lift the pipe to the correct angle so that it can be pulled into the HDD bore. The installation would use a drill-and-intersect method, which requires a drill rig at each side of the HDD installation (Mott MacDonald 2021b).

3.6.2.3 Construction Methods in Brackney South Section

For the area of potential landslides in the Brackney South section, a conceptual design is construction of a cantilevered retaining wall, installed along the outside edge of the pathway where the existing pipeline is

situated that would consist of three-foot diameter soil-cement columns installed 3 feet on-center for a length of approximately 850 feet (HDR 2020). The retaining wall would be designed as a cantilevered system to stabilize the upper and lower slopes. The wall would be constructed on the downslope side of the existing trail in which the pipe would be located. If a slide were to occur, the wall would prevent the slide mass from advancing further downslope. The wall would consist of 3-foot-diameter soil cement columns installed 3 feet on center to a depth of 70 feet. Every other column would be a steel H-beam instead of the soil cement column (HDR 2019a). A directional drilling method similar to what is proposed for the Brackney North pipe section may also be utilized for all or part of the Brackney South section.

3.6.2.4 Creek Crossings

The Proposed Project includes four open creek crossings and numerous culverted creek and drainage crossings. Potential construction methods for the creek crossings are identified in this section. No creek dewatering will be required for any of the crossings.

At the northern end of the pipeline alignment, the NCP currently crosses Newell Creek as an attachment to the upstream side of the Newell Creek Access Road Bridge for a distance of approximately 116 feet. It is expected that the existing pipeline on the bridge would be replaced with the new pipeline in the same location or on the downstream side of the bridge. The Proposed Project alignment also crosses Newell Creek just south of the Newell Creek Road/Glen Arbor Road intersection. In this location, the Proposed Project would replace this short, approximately 80 linear-foot section with the new pipeline in the same above-grade location, although trenchless directional drilling is also an option. Construction activities would be staged on either side of the creek, and no construction is anticipated in the flowing channels. The Proposed Project also crosses two unnamed, culverted drainages in the San Lorenzo Way section at San Lorenzo Way and the northern area of Rose Acres. Open trench construction methods would be used for installation during dry periods as these ephemeral drainages do not flow year round. The pipeline would be installed over the culverts.

At the FBPS, the existing NCP crosses Zayante Creek in an underground pipeline. The proposed new pipeline would be installed on existing railroad abutments parallel to and south of the Graham Road bridge on which the City's existing 24-inch Felton Diversion pipeline is located. A free span of approximately 60 feet would be required for the new 24-inch pipe. On the north side of the creek, the pipeline would pass through an existing headwall by core drilling or cutting a hole in the wall that would be filled with grout at the end of installation. The crossing would be a high point in the pipeline (see Figure 3-18). On the south side of the creek, the pipeline will be supported by two new, 30-inch diameter reinforced concrete piers, installed beyond the top of bank on the south side of the existing abutment behind an existing unreinforced concrete pier.

The pipeline route along Graham Hill Road would cross at least two culverted creeks (Eagle Creek and Power Hill Creek). The pipeline would be installed over the existing culverts.

3.6.2.5 Rail Crossing

The Graham Hill Road North section will cross the existing Santa Cruz Big Trees Rail tracks using a trenchless method that would consists of either pipe ramming or auger boring. Figure 3-15 shows the rail crossing location. Pipe ramming is a trenchless installation method for driving an open-ended steel casing using a percussive hammer. Pipe ramming is a two-stage process: pipe casing installation and product pipe installation

inside the casing. Pipe ramming is used for the installation of steel casings from 8-inch to over 144-inch diameter with most installations less than 300 feet in length. The minimum recommended work area at a launch shaft is 10,000 sf in order to accommodate the launch shaft, crane, pipe storage, air compressor, end loader or other spoil removal equipment, and truck access for spoil removal. This method requires the least amount of equipment and staging when compared to other trenchless methods (Carollo 2021).

Auger-boring is a pipe jacking method for installing a casing pipe between two shafts by means of a rotating cutting head. Spoil is transported back to the drive shaft by helical wound auger flights rotating inside a steel pipe casing that is being jacked in place simultaneously. This process requires an auger boring machine to be placed in a launch pit on grade at the beginning of the pipeline segment as well as a reception pit at the end of the drive. Auger boring is traditionally a two-stage process: pipe casing installation and product pipe installation inside the casing. Reaches from 40 to 500 feet are common lengths for this type installation. A minimum of 10,000 sf is recommended for the launching and receiving shaft work areas (Carollo 2021).

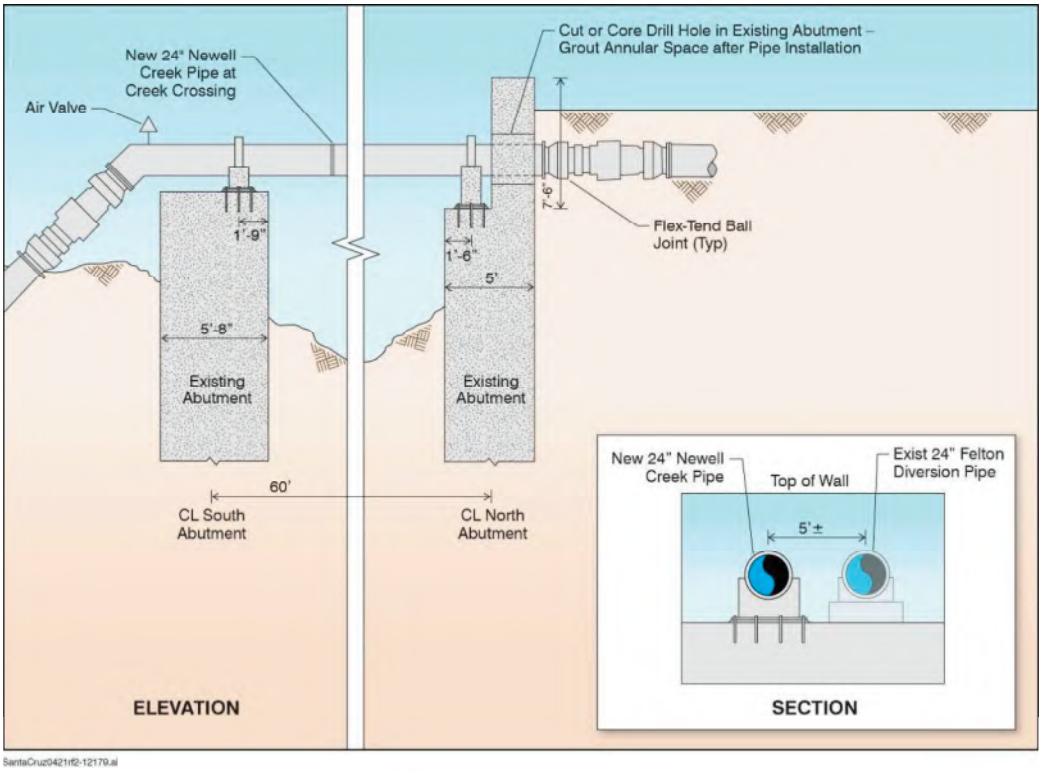
3.6.3 Project Access and Staging Areas

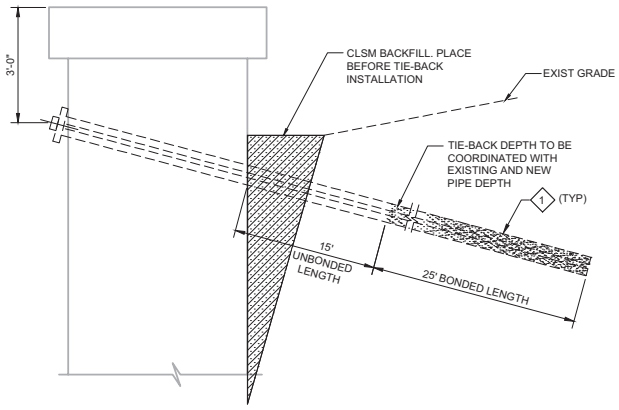
Access for vehicles carrying materials, equipment, and personnel to and from the project sites would be provided via existing roadways in the project vicinity. The primary routes for construction traffic would likely be from State Route 1 (locally referred to as Highway 1) or State Route 17 (locally referred to as Highway 17) via Graham Hill Road or Mount Hermon Road. Highway 9 also would provide access to local roads in the northern segment of the Proposed Project alignment.

The primary local roadways serving the northern segment of the Proposed Project include Newell Creek Road, Glen Arbor Road, Quail Hollow Road, Brackney Road, and San Lorenzo Way, as well as other local streets off of Glen Arbor Drive. Local roads serving the southern segment of the Proposed Project include Sims Road and Lockewood Lane, both of which connect Graham Hill Road and Mount Hermon Road. To facilitate project construction, one lane along public roads could be closed temporarily during the work day, with traffic controllers in place. Work within County roadways would require an encroachment permit from the County of Santa Cruz that would require specified traffic control measures in a Traffic Control Plan.

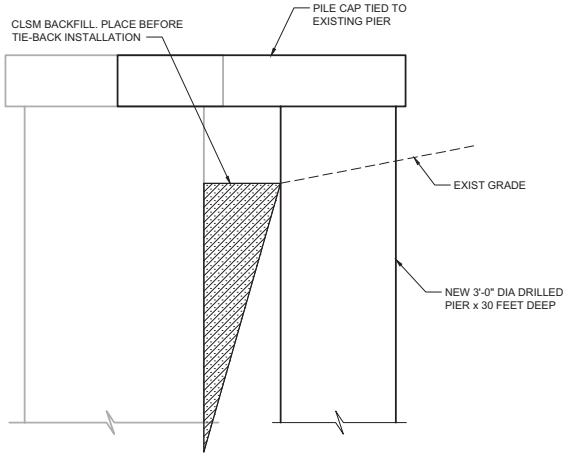
Construction staging/laydown areas have been identified in areas that are already fairly level along the existing roadways, and temporary work areas will be established for the Brackney North section as explained in Section 3.6.2.2. Staging areas would be used for storage of materials and products and equipment laydown. Minimal clearing may be required for certain staging areas. Proposed locations of staging areas in the northern segment have been identified within the following pipe sections: Newell Creek Road (see Figure 3-6), Glen Arbor Road (see Figure 3-7), Brackney South (see Figure 3-9), and San Lorenzo Way (see Figure 3-10). Proposed staging areas in the southern segment include a parking lot near Zayante Creek, parking lot on the San Lorenzo Lumber Yard property, and two areas along Graham Hill Road (see Figure 3-19).

In addition, an existing unpaved dirt road that is within the City's easement in the Graham Hill Road North section extends from the south bank of Zayante Creek to its intersection with the San Lorenzo Lumber Yard Driveway. This road is used for maintenance and construction access, and improvements may include placement of one to two inches of gravel, geocell reinforcement, wooden planks, or other acceptable means to provide for access along the easement.





OPTION 1



OPTION 2

Options for Structural Support to Existing Southern Abutment

SOURCE: Carollo 2021

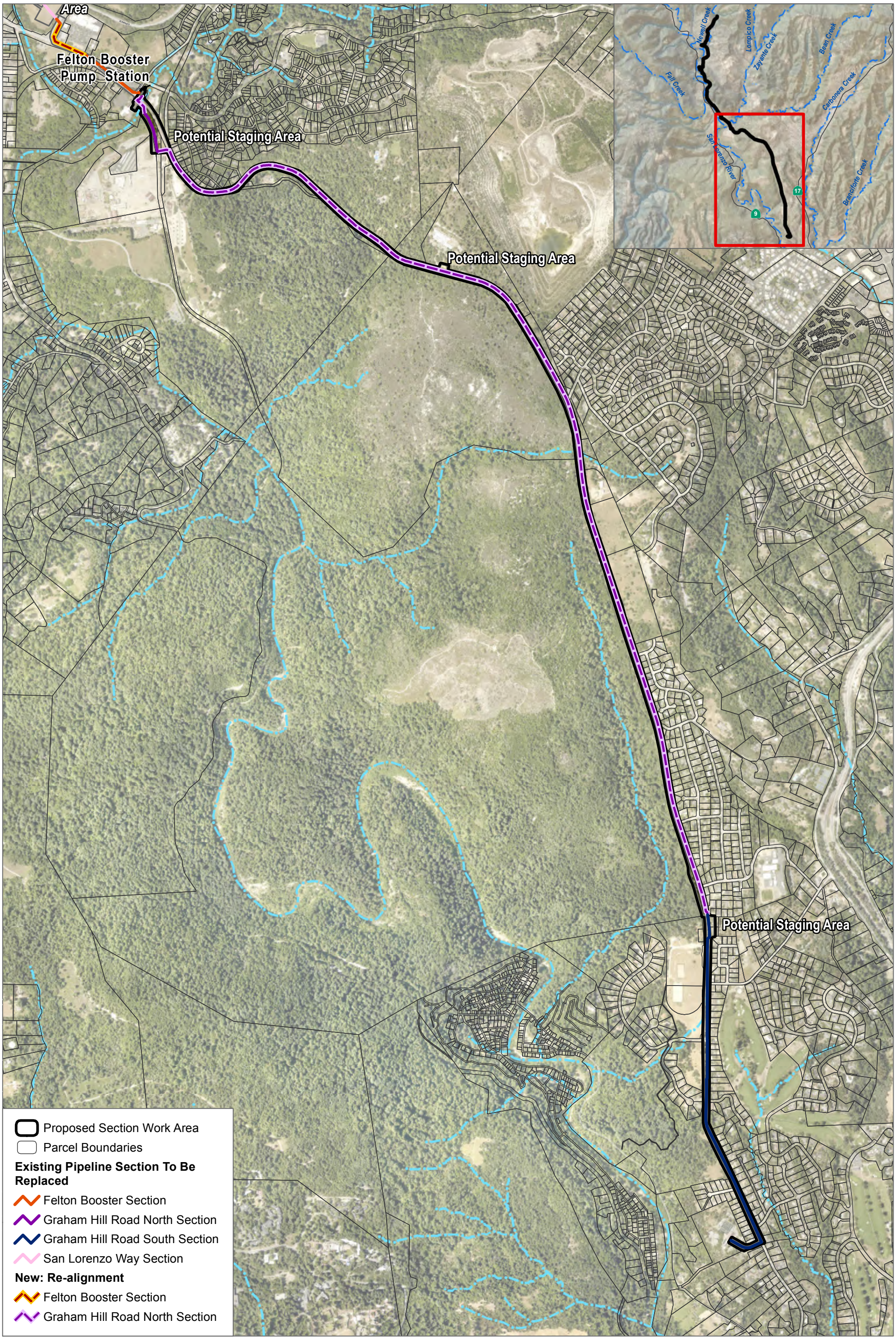
FIGURE 3-18

Zayante Creek Crossing Detail

Newell Creek Pipeline Improvement Project

DUDEK

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SOURCE: Bing 2021: County of Santa Cruz 2021

DUDEK

0 650 1,300 Feet

FIGURE 3-19

Graham Hill Road Proposed Staging Areas

Newell Creek Pipeline Improvement Project

3.6.4 Construction Workers, Work Hours and Equipment

On average, approximately 12-18 construction workers are estimated to be working at the Project site each day for construction in the southern segment and 8-12 daily construction workers are estimated for pipe sections in the northern segment. Construction generally would occur during normal weekday work hours, between 8 AM and 5 PM and in accordance with County of Santa Cruz encroachment permit requirements. However, construction along Graham Hill Road would be limited to the hours of 8 AM to 4 PM with temporary lane closures restricted to 9 AM to 3 PM. As previously indicated, the HDD installation method for the pipe in the Brackney North section would require approximately one day of continuous 24-hour installation.

Generally, the Proposed Project would require use of heavy equipment such as excavators, bulldozers, graders, rollers, dump trucks, loaders, backhoes, cranes, and generators. Haul trucks would be used to transport materials to the site and to transport any spoils off site to a permanent disposal location. Flatbed trucks would be used to transport smaller quantities of material at the site. Water trucks and fuel trucks would also be used at the site. Specialized drilling equipment would be required in locations where trenchless installation methods are proposed in the Brackney North section and under the rail tracks in the Graham Hill North section.

3.6.5 NCP Operations During Construction

Construction of the Graham Hill Road North and South pipe sections will be phased to keep the existing NCP in service as long as possible while the new pipeline is constructed. Prior to taking the existing pipeline out of service, the new pipeline would be pressure tested and ready for service, should it need to be put into service for an emergency. The existing pipeline also would need to be taken out of service to construct the new pipeline in the southern part of the alignment, approximately from Henry Cowell Drive to the GHWTP where the new pipeline is in the same location as the existing pipeline. Construction will progress from Henry Cowell Drive south to the GHWTP to allow for an emergency connection between the new pipeline and existing pipeline if an immediate return to service is needed. The northern tie-in at the FBPS will occur when the existing pipeline is taken out of service (Carollo 2021).

3.6.6 Standard Construction Practices

The City has adopted standard construction practices that would be implemented by the City or its contractors during construction activities associated with the Proposed Project, where relevant.

Erosion Control and Air Quality Control

1. Implement erosion control best management practices for all construction activities occurring in or adjacent to jurisdictional aquatic resources (resources subject to permitting under the Clean Water Act, Clean Water Act , Porter-Cologne Water Quality Act and/or California Fish and Game Code). These measures may include, but are not limited to, (1) installation of silt fences, fiber or straw rolls, and/or bales along limits of work/construction areas and from the edge of the water course; (2) covering of stockpiled spoils; (3) revegetation and physical stabilization of disturbed graded and staging areas; and (4) sediment control including fencing, dams, barriers, berms, traps, and associated basins.

2. Provide stockpile containment and exposed soil stabilization structures (e.g., Visqueen plastic sheeting, fiber or straw rolls, gravel bags, and/or hydroseed).

3. Provide runoff control devices (e.g., fiber or straw rolls, gravel bag barriers/chevrons) used during construction phases conducted during the rainy season. Following all rain events, runoff control devices shall be inspected for their performance and repaired immediately if they are found to be deficient.

4. Implement wind erosion (dust) controls, including the following:
   - Use a water truck;
   - Water active construction areas as necessary to control fugitive dust;
   - Hydro seed and/or apply non-toxic soil binders to exposed cut and fill areas after cut and fill operations;
   - Cover inactive storage piles;
   - Cover all trucks hauling dirt, sand, or loose materials off site; and
   - Install appropriately effective track-out capture methods at the construction site for all exiting trucks.

Water Quality Protection

5. Locate and stabilize spoil disposal sites and other debris areas such as concrete wash sites. Sediment control measures shall be implemented so that sediment is not conveyed to waterways or jurisdictional aquatic resources (resources subject to permitting under the Porter-Cologne Water Quality Act Section 13000 et seq, Clean Water Act Section 404, Clean Water Act Section 401, and/or California Fish and Game Code).

6. Minimize potential for hazardous spills from heavy equipment by not storing equipment or fueling within a minimum of 65 feet of any jurisdictional aquatic resource unless approved by permitting agencies along with implementation of additional spill prevention methods such as secondary containment and inspection.

7. Ensure that appropriate measures are taken to prevent gas, oil, or any other substances that could be hazardous to aquatic life or pollute habitat from contaminating the soil or entering jurisdictional aquatic resources by storing these types of materials within an established containment area. Vehicles and equipment will have spill kits available, be checked daily for leaks, and will be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. Any gas, oil, or other substance that could be considered hazardous shall be stored in water-tight containers with secondary containment. Emergency spill kits shall be on site at all times.

8. Prevent equipment fluid leaks through daily equipment inspections.

9. Implement proper waste/trash management.

The City's Standard Construction Practices for In-Channel Work and Fish Species Protection (Practices #10-12) are not applicable to the Project because no work would occur within flowing water.

General Habitat Protection

13. Minimize disturbance of riparian vegetation to the maximum extent feasible when working in or adjacent to an active stream channel.

14. Restore all temporarily disturbed sensitive natural communities areas by replanting native vegetation using a vegetation mix appropriate for the site.

The City's Standard Construction Practice for decontamination of tools and equipment prior to entering waterways (Practice #15) is not applicable to the Project because no work would occur within flowing water.

16. A qualified biologist shall conduct a training-educational session for project construction personnel prior to any mobilization-construction activities within the project sites to inform personnel about species that may be present on site. The training shall consist of basic identification of special-status species that may occur on or near the project site, their habitat, their basic habits, how they may be encountered in the work area, and procedures to follow when they are encountered. The training will include a description of the project boundaries; general provisions of the Migratory Bird Treaty Act, California Fish and Game Code, and federal and state Endangered Species Acts; the necessity for adhering to the provision of these regulations; and general measures for the protection of special-status species, including breeding birds and their nests. Any personnel joining the work crew later shall receive the same training before beginning work.

The City's Standard Construction Practices for Dewatering (Practices #17-23) are not applicable to the Project because no work would occur within flowing water.

Inadvertent Discoveries of Archaeological Resources and Human Remains

24. Any unrecorded archaeological resources (sites, features, and/or artifacts) exposed during construction are subject to protection and consideration under CEQA and the California Public Resources Code (PRC) as well as Section 106 of the National Historic Preservation Act (NHPA) as detailed in the Code of Federal Regulations (CFR). The CEQA Guidelines Section 15064.5(f) specifically addresses provisions the City of Santa Cruz will make regarding accidental discovery of historical or unique archaeological resources during construction. The responsibilities of the lead federal agency to avoid, minimize or mitigate adverse effects to a "historic property" (36 CFR Section 800.16) are detailed in 36 CFR Section 800.13[b] and would be applicable for a project with federal involvement by way of funding, permitting, approval authority, or other means.

    In general, the implementation procedures under CEQA and the NHPA in the case of an inadvertent archaeological discovery during construction are similar and are as follows:

    - If archaeological resources are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone will be determined by the City and the federal lead agency and is contingent on the approved course of action in response to the discovery.

- Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager
- A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards will evaluate the state and federal significance of the find for eligibility to the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP) in coordination with City staff.
- The City will notify the lead federal agency within 24 hours of discovery. The notification shall describe the assessment of the NRHP eligibility of the resource, specify the NRHP criteria used to evaluate the property's eligibility, and propose actions to resolve any adverse effects.
- The federal lead agency will contact the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and any interested locally affiliated Native American tribes. The SHPO, ACHP, and Native American tribes will respond within 48 hours of the notification. The federal lead agency shall consider any recommendations regarding National Register eligibility and proposed actions and notify the City of the appropriate actions. The federal lead agency official shall provide the SHPO and the ACHP a report of the actions when they are completed.
- Avoidance and/or minimization of impacts/effects is the preferred course of actions under both state and federal guidelines. If preservation in place is not feasible, additional study will likely be required. In coordination with the lead federal agency, the City will prepare a data recovery/treatment plan for retrieving important archaeological data relevant to the site's significance. The data recovery/treatment plan will be submitted to participating tribes and agencies for review and comment prior to implementation.
- If the inadvertent discovery location cannot be avoided, and continuing work would have an adverse effect on the site, the federal agency, in coordination with the City, SHPO, and Native American tribes as appropriate, will need to draft and finalize a Memorandum of Agreement for the treatment of the historic property before work can proceed.
- Implementation of the data recovery/treatment plan may include archaeological excavations, technical and laboratory analysis, and further consultation and coordination with Native American tribal representatives.
- A full written report will be prepared to include the results of all technical analyses and special studies and will be provided to participating tribes and agencies for review and comment. The report will be filed with the Northwest Information Center and will also provide for the permanent curation of recovered materials.

25. In California, the illegal possession of human remains is a felony, punishable by imprisonment (California Penal Code Section 1170[h]; Public Resources Code 5097.99[a] and [b]). Inadvertent discoveries of human remains exposed during construction on non-federal lands are subject to protection under CEQA and the NHPA. In accordance with Section 7050.5 of the California Health and Safety Code and the NHPA, if potential human remains are found, immediately notify the City, the lead federal agency, and the Santa Cruz County Coroner of the discovery. The Santa Cruz County Coroner will provide a determination within 48 hours of notification. No further excavation or disturbance of

the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made.

- If human remains are exposed **immediately stop any construction work occurring within 100 feet** which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone is contingent on the course of action mandated by the City and lead federal agency.
- If the Santa Cruz County Coroner determines that the remains are, or are believed to be, Native American, the coroner will notify the Native American Heritage Commission (NAHC) within 24 hours and all the actions described in these Standard Construction Practices regarding Inadvertent Archaeological Discoveries shall be followed.
- In accordance with California Public Resources Code, Section 5097.98 and Section 106 of the NHPA, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American.
- Within 48 hours of this notification, the MLD will recommend to the City and lead federal agency her/his preferred treatment of the remains and associated grave goods.
- The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).
- The lead federal agency will have additional government-to-government consultation requirements per the requirements of Section 106 [36 CFR § 800.2(c)(2)(ii)] which cannot be delegated to non-federal entities.

Other Practices

26. Notify adjacent property owners of nighttime construction schedules. A Construction Noise Coordinator will be identified. The contact number for the Construction Noise Coordinator will be included on notices distributed to neighbors regarding planned nighttime construction activities. The Construction Noise Coordinator will be responsible for responding to any local complaints about construction noise. When a complaint is received, the Construction Noise Coordinator shall notify the City within 48 hours of the complaint, determine the cause of the noise complaint, and implement as possible reasonable measures to resolve the complaint, as deemed acceptable by the City.

27. For construction in wildlands or in the wildland-urban interface, internal combustion engine equipment shall include spark arrestors, fire suppression equipment (e.g. fire extinguishers and shovels) shall be stored onsite during use of such mechanical equipment, and construction activities shall not be conducted during red flag warnings issued by the California Department of Forestry and Fire Protection (CAL FIRE) unless adequate fire protection measures are implemented in compliance with federal, state, and local fire prevention and protection regulations and guidance. Fire safety measures will be detailed in a Fire Safety Program on a project-by-project basis. Red flag warnings and fire weather watches are issued by CAL FIRE based on weather patterns (low humidity, strong winds, dry fuels, etc.) and listed on their website (https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/).

3.7 Project Permits and Approvals

3.7.1 Required Permits and Approvals

In addition to CEQA compliance, the Proposed Project would be subject to compliance and permitting requirements under federal, state, and local regulations. The anticipated agency permits/approvals necessary for the implementation of the Proposed Project are described below.

The City of Santa Cruz is the lead agency and is responsible for approving and implementing the Proposed Project. The Santa Cruz City Council is the decision-making body tasked with certification of the Final EIR, approval of the Proposed Project, including modification of existing easements, and adoption of CEQA findings and the mitigation monitoring and reporting program.

In addition to the City, other public agencies that have review or approval authority of the Proposed Project are outlined below. This EIR is intended to provide the information and environmental analysis necessary to assist federal and state permitting agencies (also known under CEQA as "responsible agencies") in considering the approvals required for the Proposed Project.

- **U.S. Army Corps of Engineers (USACE).** Approval of a Clean Water Act Section 404 permit in areas of impacts to waters or wetlands of the U.S., including potential creek crossings
- **U.S. Fish and Wildlife Service.** Endangered Species Act Section 7 or Section 10 consultation
- **California Central Coast Regional Water Quality Control Board (RWQCB).** Approval of a Clean Water Act Section 401 Water Quality Certification Permit in areas of impacts to waters or wetlands of the U.S., including potential creek crossings, and a Notice of Intent for coverage under the National Pollutant Discharge Elimination System Construction General Permit
- **California Department of Fish and Wildlife (CDFW).** Approval of a California Fish and Game Code Section 1602 Lake or Streambed Alteration Agreement for any construction activity within CDFW jurisdiction (e.g., the existing City easement/pipeline route along Zayante Creek and construction areas near San Lorenzo River in the Brackney North pipe section)
- **California Water Boards, Division of Drinking Water.** Review of water pipelines 24 inches and larger in diameter
- **State Historic Preservation Office.** National Historic Preservation Act Section 106 consultation for Project components that require a USACE permit or if federal funding is involved
- **County of Santa Cruz.** Approval of encroachment permit and Traffic Control Plan

Although the project alignment is located within the unincorporated area of Santa Cruz County, the City is not required to obtain building or grading permits from the County, pursuant to state law. California Government Code Sections 53091(d) and (e) provide that facilities for the production, generation, storage, treatment, or transmission of water supplies are exempt from local zoning and building ordinances.

3.7.2 Potential Funding Sources

Several potential funding sources have been identified for the Proposed Project, including Federal Emergency Management Agency (FEMA) funding, the Water Infrastructure Finance and Innovation Act (WIFIA) Program (administered and funded by the U.S. Environmental Protection Agency [EPA]) and the Drinking Water State Revolving Fund (SRF) Program (administered by the State Water Resources Control Board [SWRCB]). Because of the federal nexus through funding, the Proposed Project would be subject to compliance with the National Environmental Policy Act (NEPA). Each agency has its own checklist that addresses federal laws and executive orders. FEMA will conduct its own NEPA review as part of the planning and design grant for the Brackney North pipeline section.

In March 2020, the City received "Phase 1" FEMA grant funding through its Hazard Mitigation Grant Program (HMGP). The grant covers field investigation, design and project management for the Brackney North pipeline section, also known as "Brackney Landslide Area Pipeline Risk Reduction." Construction funding within FEMA's grant program would be considered upon completion of Phase I.

EPA is the lead agency for the NEPA decision related to the WIFIA loan. Should the Proposed Project pursue a WIFIA loan, it would be covered under WIFIA's Programmatic Environmental Assessment, and a WIFIA Questionnaire would be completed and submitted to the EPA concurrently with the CEQA process . A similar checklist is required for the SRF program, which will be completed and submitted to the SWRCB. Additional funding sources may be pursued depending on the implementation schedule for the various pipeline segments.

3.8 References

City of Santa Cruz. 2017. Brackney Landslide Area Pipeline Damage Risk Reduction Project Hazard Mitigation Grant Program (HMGP) Application Package. Submitted to California Governor's Office of Emergency Services. October 2017.

Carollo. 2021. City of Santa Cruz Newell Creek Pipeline Felton/Graham Hill Replacement Project Technical Memorandum 1 Basis of Design. August 2021.

HDR. 2018. "Newell creek Pipeline Rehab/Replacement Technical Memorandum, Subject: Newell Creek Pipeline Inventory." Santa Cruz Water Program. November 8, 2018.

HDR. 2019a. "Newell Creek Pipeline Alternatives Analysis Technical Memorandum." Santa Cruz Water Program. October 9, 2019.

HDR. 2019b. "Newell Creek Pipeline Rehab/Replacement Revised Technical Memorandum, Subject: Newell Creek Pipeline (NCP) Pipeline Prioritization of Pipeline Risk (Revised)." Santa Cruz Water Program. March 4, 2019.

HDR. 2019c. "Newell Creek Pipeline Rehab/Replacement Technical Memorandum, Subject: Newell Creek Pipeline (NCP) Pipeline Replacement and Repair Identification." Santa Cruz Water Program. March 4, 2019.

HDR. 2020. “Newell Creek Pipeline Improvements Technical Memorandum.” Santa Cruz Water Program. May 19, 2020

Kennedy Jenks. 2017. “Brackney Landslide Area Pipeline Damage Risk Reduction Project Engineering Report.” Prepared for City of Santa Cruz. October 2017.

Mott MacDonald. 2021a. Alternatives Analysis Memo Final- Brackney Landslide Area Pipeline Risk Reduction Project. May 14, 2021.

Mott MacDonald. 2021b. Basis of Design Brackney Landslide Area Pipeline Risk Reduction Project. August 27, 2021.

4 Environmental Setting, Impacts, and Mitigation Measures

4.0 Introduction to Analysis

This chapter provides a project-level analysis of the physical environmental effects of implementing the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The following sections within this chapter evaluate the environmental impacts of the Proposed Project:

- 4.1 — Impacts Not Found to Be Significant
- 4.2 — Air Quality
- 4.3 — Biological Resources
- 4.4 — Cultural Resources and Tribal Cultural Resources
- 4.5 — Energy
- 4.6 — Geology and Soils
- 4.7 — Greenhouse Gas Emissions
- 4.8 — Hazards and Hazardous Materials
- 4.9 — Hydrology and Water Quality
- 4.10 — Noise
- 4.11 — Transportation
- 4.12 — Wildfire

4.0.1 Section Organization

Each environmental resource section listed above generally has a similar format as described below.

- **Existing Conditions.** This section provides a general overview of the existing physical environmental setting and conditions related to the topic being addressed, based on the conditions present at the time that the Notice of Preparation for the EIR was released (January 2021).
- **Regulatory Framework.** This section describes applicable federal, state, and local, laws and regulations relevant to the environmental resource topic and the Proposed Project.
- **Impacts and Mitigation Measures.** This section identifies thresholds of significance used to evaluate whether an impact is considered significant, based on standards derived from Appendix G of the California Environmental Quality Act (CEQA) Guidelines and from the City of Santa Cruz CEQA Guidelines. In some cases, agency policies and regulations or professional judgment are used to further define CEQA standards of significance.

  This section first presents a discussion of the standards of significance for which no impacts have been identified, if any. The section then evaluates and analyzes project impacts, states the level of significance prior to mitigation, and proposes mitigation measures for significant impacts that would

reduce such impacts, if feasible. A statement regarding the level of significance of each impact after mitigation precedes the mitigation measures for that impact.

Cumulative impacts are discussed in each environmental resource section following the description of the project-specific impacts. The cumulative impact analysis considers the effects of the Proposed Project together with, and against the backdrop of, other past, present, or reasonably foreseeable future projects proposed in the project vicinity and region. The cumulative impact analysis is based on the same setting, regulatory framework, and significance thresholds presented for each respective resource topic. Additional mitigation measures may be identified if the analysis determines that the Proposed Project's incremental contribution to a significant cumulative impact would be cumulatively considerable and, therefore, significant in and of itself. Section 4.0.2 below describes the assumptions and methodology for assessing cumulative impacts.

4.0.2 Significance Determinations

In accordance with CEQA, specifically Public Resources Code Section 21068, a "significant effect on the environment" means a substantial or potentially substantial adverse change in the environment. The significance thresholds used for each environmental resource topic are presented in each section of this chapter immediately before the discussion of impacts. For each impact described, one of the following significance determinations is made:

- ***No Impact.*** This determination is made if there is no potential that the Proposed Project could affect the resource at issue.
- ***Less than Significant.*** This determination applies if there is a potential for some limited impact on a resource, but the impact is not significant in accordance with the significance standard.
- ***Less than Significant with Mitigation.*** This determination applies if there is the potential for a substantial adverse effect in accordance with the significance standard, but mitigation is available to reduce the impact to a less-than-significant level.
- ***Significant and Unavoidable.*** This determination applies to impacts that are significant, and for which there appears to be no feasible mitigation available to substantially reduce the impact.

4.0.3 Scope of Analyses

4.0.3.1 Study Area

As described in the Project Description, the Proposed Project is located in the Santa Cruz Mountains, primarily in the unincorporated San Lorenzo Valley area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City of Santa Cruz, but is surrounded by unincorporated lands. The Proposed Project consists of replacement of 8.75 miles of the existing NCP. The proposed NCP northern segment extends from the Newell Creek Access Road Bridge just south of Newell Creek Dam, to the Felton Booster Pump Station (FBPS) and generally follows the existing NCP alignment through residential neighborhoods. The proposed southern segment extends from the FBPS to the GHWTP. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), which includes the paved roadway and unpaved shoulders adjacent to the paved road, and/or existing and new City easements, except for the proposed Brackney North section that would be installed using

a trenchless method as described in Section 3.6.2.2, Construction Methods in Brackney North Section. Trenchless methods would also be used for a railroad crossing in the northern portion of the Graham Hill Road North section and in the Brackney South section.

For most impact topics, the study area includes the area within and adjacent to the pipeline construction corridor identified in Tables 3-2 and 3-3 in Chapter 3, Project Description. However, for some topics, such as air quality and greenhouse gas emissions, the study area includes the Monterey Bay region.

4.0.3.2 Analysis Approach

The impact analyses include both direct and indirect impacts resulting from project construction and operation. However, the project does not include new pump stations or other facilities that would result in new operations, and periodic maintenance of the new pipeline would be the same as currently exists. Therefore, the impact analyses primarily address impacts related to construction and installation of the Proposed Project. In accordance with Section 15125 of the State CEQA Guidelines, the EIR examines impacts based on physical environmental conditions as they exist at the time the EIR Notice of Preparation (NOP), which is considered the baseline conditions. For this project the NOP was released in January 2021, which is the baseline for analyses in this EIR.

Three pipeline sections have been identified for replacement at this time: the Brackney North, Graham Hill Road North and Graham Hill South sections. In a new alignment in Graham Hill Road, the Graham Hill North section would replace the existing NCP through Henry Cowell Redwoods State Park. The engineering design for these sections have been completed through the 30% design plan phase. For the remainder of the pipeline sections in the northern segment, the analyses consider impacts of installation of the new pipeline within specified construction disturbance corridors as identified in Table 3-2 in Section 3.5.2.1.

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately late 2022/early 2023 to 2032. The Graham Hill Road and Brackney North pipe sections would be constructed generally between late 2022/early 2023 and 2024, and the remaining pipe sections in the northern segment are estimated to be constructed in 2030 and 2031. The estimated construction schedule, construction workers, and construction equipment for each pipeline section are summarized in Table 3-4 in Section 3, Project Description. Construction would be scheduled on weekdays generally between 8 AM and 5 PM, except construction along Graham Hill Road would be scheduled on weekdays between the hours of 8 AM and 4 PM with road lane closures only permitted between 9 AM and 3 PM.

4.0.4 Cumulative Impacts Overview

The section below presents the CEQA requirements pertaining to the cumulative projects and cumulative analysis that have been considered for each environmental resource topic at the end of each section in this chapter.

4.0.4.1 CEQA Guidelines Requirements

CEQA Guidelines Section 15130(a) requires that an environmental impact report (EIR) discuss cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." As defined in CEQA Guidelines Section 15355, a cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. Pursuant to CEQA Guidelines Section 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," the lead agency need not consider the effect significant.

CEQA requires an evaluation of cumulative impacts when they are significant. When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. Furthermore, according to CEQA Guidelines Section 15130 (a)(1), there is no need to evaluate cumulative impacts to which the project does not contribute.

An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus not significant when, for example, a project implements or funds its fair share of a mitigation measure designed to alleviate the cumulative impact if the lead agency identifies facts and analysis to support the conclusion that the contribution will be rendered less than cumulatively considerable (CEQA Guidelines Section 15130(a(3)). An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide detail as great as that provided for the impacts that are attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified project contributes.

4.0.4.2 Cumulative Projects and Scope of Analysis

The analysis of cumulative impacts may consider either 1) a list of past, present, and probable future projects producing cumulative impacts or 2) a summary of growth projections contained in an adopted plan that evaluates conditions contributing to cumulative impacts, such as those contained in a General Plan. Projects that are relevant to the cumulative analysis include projects that could:

- Contribute incremental environmental effects on the same resources as, and would have similar impacts to, those discussed in the EIR applicable to the Proposed Project.
- Be located within the defined geographic scope for the cumulative effect. The defined geographic scope is dependent on the environmental resource affected.
- Contribute impacts that coincide with the Proposed Project's impacts during either construction (short-term) or operation (long-term).

This EIR uses a list-based approach for the development of the cumulative projects. Based on the above factors, cumulative projects considered for the analysis include other capital improvement projects planned by the Santa Cruz Water Department (City) that would be located in proximity to the project site or whose

impacts would otherwise combine with the impacts of the Proposed Project. Santa Cruz County Planning Department staff were also contacted to determine if other proposed or pending projects are located in proximity to the project site; staff indicated that there are not any major proposed or pending development projects in the vicinity of the Proposed Project sites or within two miles of the Proposed Project (Williams 2021). The City of Scotts Valley's website was checked for cumulative projects in Scotts Valley. Cumulative projects are discussed below and summarized in Table 4.0-1 at the end of this section.

Santa Cruz Water Department Projects

Capital Improvement Program Projects

The City's Capital Improvement Program (CIP), also referred to as the Santa Cruz Water Program, includes plans and funding for numerous capital improvements projects, including rehabilitation or replacement projects, upgrades and improvement projects, water supply augmentation projects, and water main replacements (City of Santa Cruz 2020a, 2020b). The City is implementing the City Council-adopted recommendations of the Water Supply Advisory Committee for supplemental water supply, which are incorporated in the 2015 Urban Water Management Plan (UWMP) (City of Santa Cruz 2016), to which some of these projects relate. It is noted that the 2020 UWMP is expected to be approved in November 2021. Table 4.0-1 identifies the comprehensive list of capital projects that were reviewed for this EIR.

Santa Cruz Water Rights Project

The City is proposing changes to its existing water rights through the Santa Cruz Water Rights Project (SCWRP) to address key issues needed to improve flexibility in operation of the City's water system to better use limited water resources, while enhancing stream flows for local anadromous fisheries. The SCWRP also includes water supply augmentation components and surface water diversion improvements that could be implemented after the water rights modifications are approved. The underlying purpose of the SCWRP is to improve flexibility in operation of the City's water system while enhancing stream flows for local anadromous fisheries. During the development of the City's pending Anadromous Fisheries Habitat Conservation Plan (ASHCP), the City negotiated with the California Department of Fish and Wildlife (CDFW) and the National Marine Fisheries Service (NMFS) to develop levels of stream flows that would better protect federally listed Central California Coast coho salmon (coho) and Central California Coast steelhead (steelhead) in all watersheds from which the City diverts water (Agreed Flows). Incorporating these Agreed Flows into all City water rights is necessary to benefit local fisheries, specifically for coho and steelhead, but would further constrain the City's limited surface water supply. Consequently, the City needs to improve operational flexibility of the water system within existing rights, permits, and licenses to allow better use of limited water resources. To do this, the City is proposing water rights modifications to its existing rights, permits, and licenses to expand the authorized place of use (POU), to better utilize existing diversions, and to extend the City's time to put water to full beneficial use.

The SCWRP includes both "project" and "programmatic" components that are summarized below.

- **Water rights modifications** include modifications related to place of use, method of diversion, points of diversion and re-diversion, underground storage and purpose of use, extension of time and stream bypass requirements for fish habitat (referred to as Agreed Flows);
- **Water supply augmentation components**, which include:
    - Aquifer storage and recovery (ASR):

        - New ASR facilities at unidentified locations (referred to as "new ASR facilities"), which are program components.
        - Beltz ASR facilities at the existing Beltz well facilities (referred to as "Beltz ASR facilities"), which are project components.
    - Water transfers and exchanges and associated intertie improvements, which are program components.
- **Surface water diversion improvements**, which include the Felton Diversion fish passage improvements and the Tait Diversion and Coast Pump Station improvements.

The City is in the process of completing a Final EIR for the SCWRP. The following proposed SCWRP components are located in proximity to the Proposed Project: 1) new ASR facilities with potential location in the Santa Margarita aquifer, but specific locations have not yet been identified; 2) City/Scotts Valley Water District intertie, potentially located between Scotts Valley and Sims Road along La Madrona Drive; 3) Felton Diversion Fish Passage Improvements; and 4) Tait Diversion and Coast Pump Station Improvements.

Habitat Conservation Plans

Since 2001, the City has been developing two Habitat Conservation Plans (HCPs)[1], one pertaining to anadromous salmonids[2] with the National Marine Fisheries Service and one pertaining to other listed species[3] with the U.S. Fish and Wildlife Service (USFWS). The HCPs will provide for California Endangered Species Act and Federal Endangered Species Act compliance for the City's ongoing operations that may affect special-status species.

The Operations and Maintenance HCP (OMHCP) developed with the USFWS and associated incidental take permit was completed, and the incidental take permit for listed species other than anadromous salmonids was issued in January 2021 (City of Santa Cruz 2021a). The OMHCP does not include construction projects that improve habitat conditions. The biological goals and objectives and conservation measures include restoring habitat temporarily disturbed by activities covered by the permit, contributing to protected and managed lands that support covered species populations, implementing bypass flows consistent with the Anadromous Salmonid HCP (ASHCP), pursuing other conservation actions that will result in conservation benefits to covered species, and implementing general and species-specific minimization and best management practices.

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1 A HCP is prepared under Section 10 of the Federal Endangered Species Act by nonfederal parties seeking to obtain a permit for incidental take of federally listed fish and wildlife species. A HCP can also form the basis for an application for incidental take of state-listed species under Section 2081 of the California Endangered Species Act. A HCP includes descriptions of likely impacts to the subject species and the steps an applicant will take to avoid, minimize, and mitigate such impacts.

2 The anadromous salmonids covered by the Anadromous Salmonid (ASHCP) include Central California Coast coho salmon (coho) (*Oncorhynchus kisutch*), a state- and federally listed endangered species, and the Central California Coastal steelhead (steelhead) (*Oncorhynchus mykiss*), a federally listed threatened species.

3 Listed species covered by the other HCP include Ohlone tiger beetle (*Cicindela ohlone*), a federally listed endangered species; Mount Hermon June beetle (*Polyphylla barbata*), a federally listed endangered species; tidewater goby (*Eucyclogobius newberryi*), a federally listed endangered species; Pacific lamprey (*Lampetra tridentata*), a species not currently listed under the Endangered Species Act; California red-legged frog (*Rana draytonii*), a federally listed threatened species; western pond turtle (*Actinemys marmorata*), a federal species of concern; Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), a federally listed endangered species; Robust spineflower (*Chorizanthe robusta* var. *robusta*), a federally listed endangered species; Santa Cruz tarplant (*Holocarpha macradenia*), a federally listed threatened species; and San Francisco popcornflower (*Plagiobothrys diffuses*), a state-listed endangered species.

The ASHCP was submitted for agency review in spring 2021 (City of Santa Cruz 2021b). Initiation of environmental review for the ASHCP and associated permit applications is expected to commence in fiscal year 2022 with the goal of completing the permit process by late 2022 or early 2023. The ASHCP would commit the City to maintaining minimum bypass flows for anadromous fisheries at all City diversions as with the SCWRP. The conservation strategies of the ASHCP are designed to avoid, minimize, and fully mitigate the effects of the City's activities covered by the ASHCP on species and their habitat in support of the long-term viability of these populations within streams and habitats affected by the activities.[4]

The City has one other low-effect HCP and related Incidental Take Permit covering the Mount Hermon June beetle, Zayante band-winged grasshopper, and the Ben Lomond spineflower at the GHWTP (City of Santa Cruz 2013). This HCP has been implemented since 2013 at the GHWTP and it also includes establishment of a permanent 17-acre preserve in the Laguna Watershed, which serves as off-site mitigation for Mount Hermon June beetle. This preserve is in place and is being managed by the City under a Habitat Management and Monitoring Plan for the Laguna Sandhills Preserve (City of Santa Cruz 2014). Ongoing management activities are intended to protect and preserve habitat at the preserve and would not contribute to cumulative impacts. Therefore, this preserve and its Habitat Management and Monitoring Plan are not further evaluated in the cumulative analysis.

Other Cumulative Infrastructure and Development Projects

There are several infrastructure and other development projects that are proposed in the vicinity of the Proposed Project. These include County of Santa Cruz bridge replacement projects and development projects in the cities of Santa Cruz and Scotts Valley as identified on Table 4.0-1. Additionally, the University of California, Santa Cruz 2021 Long Range Development Plan is also included because it constitutes a project of regional significance, even though it is not located in proximity to the Proposed Project. Some of these cumulative projects could have construction periods that overlap with the Proposed Project, depending on the ultimate timing of construction, that could result in cumulative effects within a specific geographic area.

[4] The activities covered by the ASHCP include water diversion and operation, rehabilitation, replacement, repair, and maintenance of conveyance facilities and other existing infrastructure. Activities also include municipal facility operations and maintenance including flood control channel operation and maintenance), land management, monitoring, and habitat restoration.

Table 4.0-1. Cumulative Projects

	Project Name	Project Location	Project Description	Estimated Construction Schedule
1	Santa Cruz Water Rights Project (includes Felton Diversion and Tait Diversion and Coast Pump Station upgrades, and aquifer storage and recovery (ASR) in Mid-County and Santa Margarita Groundwater Basins)	Various Locations in unincorporated Santa Cruz County. Components in proximity to the Proposed Project include: • ***East of Proposed Project*** – Intertie with city of Scotts Valley • ***West/South of Proposed Project*** - Felton Diversion and Coast Pump Station Upgrades	The SCWD is proposing changes to its existing water rights through the SCWRP to address key issues needed to improve the City's water system flexibility while enhancing stream flows for local anadromous fisheries as described above. This project also includes infrastructure upgrades at the Felton and Tait Diversions and Coast Pump Station, ASR in Mid-County and Santa Margarita Groundwater Basins, and water transfers and exchanges with neighboring water agencies and associated intertie facilities.	2021-2030
City of Santa Cruz Water Projects in Capital Improvement Program (CIP)Bra				
2	Felton Diversion Pump Station Assessment	***West of Proposed Project*** Unincorporated Santa Cruz County, near community of Felton and Proposed Project	Evaluation of the existing dam and pump station with recommendations to rehabilitate or replace existing facilities. A hydraulic assessment of the existing facility will be conducted to determine what, if any, improvements or operational changes are needed to pump from the diversion directly to the GHWTP. To improve energy efficiency, new pumps and drives at the diversion are also anticipated.	2027-2028
3	Newell Creek Dam Inlet/Outlet Replacement Project	***North of Proposed Project*** Unincorporated Santa Cruz County, near the community of Ben Lomond	Replacement of the existing aging inlet/outlet works at the Newell Creek Dam (NCD), which impounds Loch Lomond Reservoir (Reservoir), and replacement of the northern segment of the Newell Creek Pipeline (NCP) that transports water to the Reservoir from Felton Diversion and from the Reservoir to the GHWTP. Construction commenced in Spring 2020.	2020-2023
4	Habitat Conservation Plans	Unincorporated and incorporated locations in Santa Cruz County	Anadromous Salmonid HCP under development (National Marine Fisheries Service) and Operations and Maintenance HCP recently completed (U.S. Fish and Wildlife Service).	Not applicable
5	GHWTP Concrete Tanks Project	***Near southern end of Proposed Project*** City of Santa Cruz	Infrastructure improvements to the GHWTP are necessary to meet regulatory requirements, improve operations and increase overall reliability. The design phase of this project is nearly complete for the replacement of the Filtered Water Tank, Wash Water Reclamation Tank (Reclaim Tank), and Sludge Storage Tank.	2020-2024

Table 4.0-1. Cumulative Projects

	Project Name	Project Location	Project Description	Estimated Construction Schedule
6	GHWTP Facility Improvement Project	***Near southern end of Proposed Project*** City of Santa Cruz City of Santa Cruz	Treatment process and structural improvements are planned for the Graham Hill Water Treatment Plant (GHWTP) to improve reliability of meeting water quality goals, to support the City's Water Supply and Augmentation Strategy (i.e. aquifer storage and recovery and water transfers), to assure supply and treatment resiliency given future climate change impacts to hydrology and water quality, and to address existing deficiencies related to the age of the infrastructure. A design-build team has been procured to execute the design phase from 2021 through 2024 with the subsequent construction duration, pending CEQA review, anticipated from 2024 through 2028	2023-2028
Other Infrastructure and Public Projects				
7	Rancho Rio Avenue at Newell Creek Bridge Replacement	***West of Proposed Project.*** Unincorporated Santa Cruz County	Replace existing 38-foot long, one-lane bridge over Newell Creek with a two-lane bridge and improved roadway approaches.	2025
8	Quail Hollow Road at Zayante Creek Bridge Replacement	***West of Proposed Project.*** Unincorporated Santa Cruz County	Replace the 84-foot-long Quail Hollow Road Bridge over Zayante Creek with a two-lane, single-span concrete box girder with improved roadway approaches.	2024
9	San Lorenzo Way at San Lorenzo River Bridge Replacement	***West of Proposed Project.*** Unincorporated Santa Cruz County	Replace existing bridge over San Lorenzo Valley due to substandard load capacity and structural deficiencies. Project will replace the existing one-lane structure with a two-lane clear span concrete box girder bridge and standard bridge approaches.	2021
10	Quail Hollow Ranch County Park Master Plan Amendment	***East of Proposed Project northern segment*** - Master Plan amendment for new trails, habitat restoration and signage	Master Plan amendment for new trails, habitat restoration and signage.	Unknown
Residential, Commercial, and Mixed-Use Projects				
11	1930 Ocean View Extension Project	***South of Proposed Project*** City of Santa Cruz, Ocean Street Extension	32-unit condominium project	Unknown; approved in September 2018
12	La Madrona Mixed-Use Project	***East of Proposed Project southern segment*** - City of Scotts Valley	80-room hotel with a 6,600 square foot (sf) restaurant and 184 residential units (110 senior/74 family) in two, four-story buildings on La Madrona Drive.	Unknown; project under CEQA review

Table 4.0-1. Cumulative Projects

	Project Name	Project Location	Project Description	Estimated Construction Schedule
13	Oak Creek Park Mixed- Use Development	***East of Proposed Project southern segment*** - City of Scotts Valley	Mixed-use commercial (25,000 sf) and residential (52 units) development at Mt. Hermon Road and Glen Canyon.	Unknown; project under CEQA review
14	Bay Photo Apartments	***East of Proposed Project southern segment*** - City of Scotts Valley	Conversion of an existing 92-space parking lot into a 19-unit apartment project, at 4627 Scotts Valley Drive.	Unknown
15	Encore Condominium Project	***East of Proposed Project southern segment*** - City of Scotts Valley	16-unit condominium project	Unknown; Approved
16	Bay Village-Erba Lane	***East of Proposed Project southern segment*** - City of Scotts Valley	10-unit single-family home project	Unknown; Approved
17	Valley Gardens, 263 Mountain Hermon Road	***East of Proposed Project southern segment*** - City of Scotts Valley	116 residential dwelling units,, 8,500 commercial, and 1,500 sf of outdoor dining	CEQA review underway

4.0.5 References

City of Santa Cruz. 2016. City of Santa Cruz 2015 Urban Water Management Plan. Prepared by City of Santa Cruz Water Department. August 2016.

City of Santa Cruz. 2020a. Capital Investment Program. Fiscal Years 2020-2024. Accessed September 16, 2021 at https://www.cityofsantacruz.com/home/showpublisheddocument/77130/637000760636300000.

City of Santa Cruz. 2020b. "Capital Improvement Program." Water Department. Accessed September 16, 2021 at https://www.cityofsantacruz.com/government/city-departments/water/engineering/santa-cruz-water-program.

City of Santa Cruz. 2021a. *Final City of Santa Cruz Operations and Maintenance Habitat Conservation Plan for the Issuance of an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act.* Prepared by Ebbin, Moser + Skaggs LLP, Hagar Environmental Science, Dana Bland & Associates, Entomological Consulting Services, Biotic Resources Group. January 25, 2021.

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4.1 Impacts Not Found to be Significant

California Environmental Quality Act (CEQA) Guidelines Section 15128 requires that an environmental impact report (EIR) contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an initial study. This section describes impacts not determined to be significant related to implementation of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). For this EIR, issues related to aesthetics, agriculture and forestry resources, land use, mineral resources, population and housing, public services, recreation, and utilities and service systems were found not to be significant for the Proposed Project as discussed below. See Chapter 3, Project Description, for a detailed description of the Proposed Project.

4.1.1 Aesthetics

With regard to potential aesthetic impacts, Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines consider whether a project would have a substantial adverse effect on a scenic vista; substantially damage scenic resources; substantially degrade the existing visual character or quality of public views of the site and surroundings; create a new source of substantial light or glare; or have a substantial, demonstrable, negative aesthetic effect. This section includes an evaluation of potential aesthetic impacts associated with the Proposed Project. With regard to potential visual impacts, Appendix G of the CEQA Guidelines considers whether a project would have an adverse effect on a scenic vista, damage scenic resources, degrade existing visual character or quality, or create a new source of light or glare.

Scenic Views/Vistas and Visual Character

No designated scenic vistas are located near the project site. The project site is surrounded by mountainous terrain and dense forested vegetation which obscure public views of the site. The Proposed Project involves the installation of a primarily underground pipeline, with small segments of pipeline at creek crossings and minor appurtenances located above-grade. Project construction would occur within existing road pavement and road rights-of-way (ROW). Upon completion of construction, project components would not be visible, aside from above-grade creek crossings and minor appurtenances which would not differ substantially from the existing visual character of the project area. The Proposed Project, as a primarily below-grade pipeline, would not block, alter, or obstruct scenic views. Therefore, the project would have no impact on scenic vistas.

Scenic Resources

The Project is located in proximity to two scenic roads. State Route 9 (locally referred to as Highway 9), which is located west of the Proposed Project northern segment, is designated by Caltrans as an eligible State Scenic Highway (Caltrans 2021). Additionally, a segment of Graham Hill Road from Highway 9 to Lockwood Lane is designated as a scenic road in the Santa Cruz County General Plan (County of Santa Cruz 1994). This segment of Graham Hill Road is part of the NCP proposed realignment. The Proposed Project is not located adjacent to Highway 9. Although construction would occur adjacent to and within Graham Hill Road, the Project would not be visible because the NCP components would be entirely underground, except for minor appurtenances, such as air valves that generally extend approximately 24 inches above ground and would not be highly visible.. Further, the Project does not involve the removal of trees or structures along these roads. Minor tree trimming

may occur along Graham Hill Road for equipment access but this would occur in accordance with County encroachment permit requirements and would not substantially detract from the scenic nature of the roadway. Therefore, the Project would not visually alter designated scenic roads, and no impact to scenic resources would occur.

Visual Character

The Proposed Project consists of installation of a new, predominantly underground pipe. The Project does not involve the construction of substantial above-ground components, except for low-to-the-ground air vents and small pipeline segments at creek crossings. The Proposed Project does not involve the removal of visually prominent trees or structures. Therefore, the Project would not substantially alter the visual character of the Project area and no impact would occur.

Light and Glare

The Proposed Project would continue existing operations and would not create light or glare because Project components would be underground. Thus, no impact related to light and glare would occur.

4.1.2 Agriculture and Forest Resources

4.1.2.1 Agriculture

With regard to potential impacts to agriculture, Appendix G of the CEQA Guidelines asks whether a project would directly or indirectly result in the conversion of agricultural lands to non-agricultural use, or conflict with existing zoning for agricultural use or with a Williamson Act contract. No farmland or grazing land is located on or near the Proposed Project pipe alignment. The project site is not zoned for agricultural use. The Proposed Project sites are mapped as Other Land or Urban and Built-Up Land by the California Department of Conservation (California Department of Conservation 2018). Therefore, the Project would not have any impact on agricultural resources.

4.1.2.2 Forest Resources

Forested lands and timberland occupy a substantial portion of Santa Cruz County, with large areas of timber production in the Santa Cruz Mountains and North Coast. The Proposed Project is located within an area containing redwood, oak and other forest associations (see Section 4.3, Biological Resources).

The California Timberland Productivity Act (Government Code Section 51100 et seq.) establishes the statewide basis for timberland production zoning. A county may zone lands for timberland production and thereby qualify the landowner for the preferential taxation provided for under the Forest Taxation Reform Act. Land within a Timber Protection Zone (TPZ) is restricted to growing and harvesting timber and other compatible uses approved by the county. The use of this land must be "enforceably restricted" to growing and harvesting timber in order to qualify for preferential taxation. Commercial harvesting of timber on non-federal lands in California, whether or not the property is under timberland contract, is regulated under the state's Z'berg-Nejedly Forest Practice Act (Public Resources Code Section 4511 et seq.) and the related Forest Practice Rules (Title 14, California Code of Regulations Chapters 4, 4.5, and 10). Through this legislation, the state has established a comprehensive and specialized program for reviewing and regulating the harvesting of timber. Harvest is

strictly regulated through the review and approval of plans (e.g., Timber Harvesting Plan) by the California Department of Forestry and Fire Protection (CAL FIRE). The Proposed Project crosses four parcels that are zoned Timber Production in the Santa Cruz County Code (County of Santa Cruz 2021a) in the San Lorenzo Way, Brackney South and Newell Creek Road pipe sections.

The Proposed Project would not result in timber harvest or the removal of trees that represent timber value. The Project does involve the removal of approximately 4-8 riparian trees along Zayante Creek, which do not represent timber value or a forest resource. Impacts associated with tree removal are addressed in Section 4.3, Biological Resources. Therefore, the Project would have no impact to forest resources.

4.1.3 Land Use and Planning

With regard to potential land use and planning impacts, the CEQA Appendix G Guidelines focus on whether a proposed project would physically divide an established community; or conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The Proposed Project consists of replacement of an existing raw water pipeline in a semi-rural mountain area. The Project does not include any elements that would result in physical division of an established community.

The Proposed Project is located within unincorporated Santa Cruz County, except for the southern portion of the Proposed Project that is located at the City's Graham Hill Water Treatment Plant (GHWTP) that is located within the City of Santa Cruz. The City is exempt from County zoning ordinance and building code requirements pursuant to California Government Code Section 53091(d) and (e), which provides that facilities for the production, generation, storage, treatment, or transmission of water supplies are exempt from local zoning and building ordinances. Thus, the Project would not conflict with County regulations set forth in the zoning ordinance or building code related to avoiding or mitigating environmental effects. Furthermore, the Project would not result in a change or expansion of the existing NCP use or capacity.

Implementation of the Project would support the City's continued ability to deliver drinking water to its customers from the existing Loch Lomond Reservoir. There are no policies in the City's General Plan applicable to the Project. Therefore, the Project would not result in conflicts with existing policies or regulations.

4.1.4 Mineral Resources

The CEQA Appendix G Guidelines state that a project would have potential impacts on mineral resources if it would result in the loss of availability of a known mineral resource or locally important mineral resource recovery site. The California Geological Survey is responsible for classifying land into Mineral Resource Zones (MRZs) under the Surface Mining Control and Reclamation Act. The Proposed Project pipe alignment is located primarily on lands with a mineral lands classification of MRZ-4 (for aggregate resources). Areas classified MRZ4 are areas where available information is inadequate for assignment to any other MRZ category (California Department of Conservation 1987). The MRZ4 classification does not imply that there is little likelihood for the presence of mineral resources, but rather there is a lack of knowledge regarding mineral occurrence (California Department of Conservation 1999).

Mineral resources in Santa Cruz County include four closed and four active quarries. Existing quarries in the general Project vicinity include the Quail Hollow and Hanson Quarries and the former Olympia Quarry, all of which are located east of the Proposed Project.

The Proposed Project is located within and along existing roads and easements. There are no known available mineral resources or locally important mineral resource recovery sites delineated in the Project area. Thus, the Project would have no impact on known or locally important mineral resources.

4.1.5 Population and Housing

The CEQA Appendix G Guidelines state that a project would have a population and housing impact if it either directly or indirectly induces substantial population growth, or displaces substantial numbers of existing housing or people. The Proposed Project consists of installation of new pipe to replace the existing NCP. No residential land uses are located on the Proposed Project sites, and the Proposed Project would not include any new residential or business land uses or displace existing housing or people, necessitating construction of replacement housing. The Project would not generate new permanent residential population or employment as operations to maintain the pipeline would not change. The Project would not extend roads or procure additional water supplies which could result in indirect population growth. As such, the Project would have no impact on population and housing.

4.1.6 Public Services and Recreation

Fire, Police, Schools, and Other Public Facilities

With regard to potential public services impacts, the CEQA Appendix G Guidelines focus on whether a proposed project would result in substantial adverse physical impacts associated with the provision of, or need for, new or physically altered governmental facilities, including fire protection, police protection, schools, parks, and other public facilities, in order to meet acceptable performance objectives. The Project would not include any new land uses that would generate new demand for public services. As described above in Section 4.1.5, no new residences or businesses are proposed and the Project would not lead to new population or employment. Therefore, the Proposed Project would not result in an increase in population or employees and would have no impact on public services.

Parks and Recreational Facilities

With regard to potential park or recreation impacts, the CEQA Appendix G Guidelines focus on whether a project would include new or expanded recreational facilities that may have a significant effect on the environment, or whether a project would increase the use of existing recreational facilities such that deterioration of the facilities would be accelerated. The Proposed Project would not involve the construction of parks or recreational facilities and would not create a need for the expansion or addition of recreational facilities. The Project would not result in any new residences, businesses, or additional employment, and there would be no increase in population that could potentially generate increased demand for or use of parks and recreational facilities in the Project area. Therefore, the Project would have no impact on parks and recreational facilities.

4.1.7 Utilities and Service Systems

The CEQA Appendix G Guidelines consider potential impacts to utilities to be significant if a project would exceed wastewater treatment requirements; require or result in construction of new water, wastewater, or stormwater facilities or expansion of existing facilities; have insufficient water supplies or wastewater treatment capacity to serve the project; have insufficient landfill capacity to accommodate the project's solid waste disposal needs; or violate regulations related to solid waste. The Proposed Project consists of installation of a new raw water pipeline to replace the existing NCP. The Project would not result in construction of new residences, businesses, or additional employment that could potentially generate increased demand for utilities and service systems. The Project itself is the replacement of an existing water supply facility, the impacts of which are discussed throughout this EIR. Therefore, the Proposed Project would not impact utilities and service systems, including wastewater treatment or stormwater facilities.

Construction activities would generate solid waste. Excavation during project construction would generate excess soils that would be hauled to a permanent disposal landfill or reused at other sites determined by the contractor. In general, construction would not result in generation of a substantial amount of waste materials requiring off-site disposal. Earthen spoils that could not reused at other sites (e.g., for sites that would use new/engineered backfill material rather than native material) could either be used as fill for other construction projects in the area or could be hauled to a landfill to be used as intermediate cover. It is expected that the disposal of construction materials would generally be limited, and the majority of construction waste would be recycled and reused due to the cost of disposing of such materials.

Off-site disposal would be at the City's Resource Recovery Facility (RRF), which has an expected closure date of January 2058, or the County's Buena Vista Landfill, which has an expected closure date of July 2031. The City's facility and the Buena Vista Landfill have remaining capacities of 46% and 29%, respectively, or a total of 7,013,018 cy of solid waste. Given this, the City's RRF and County's Buena Vista Landfill would have adequate capacity to accommodate solid waste generated by the Proposed Project and the impact would be less than significant.

4.1.8 References

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4.2 Air Quality

This section describes the existing air quality conditions of the Proposed Project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on air quality modeling conducted for the Proposed Project, as part of the preparation of this environmental impact report (EIR). The results of the air quality modeling are summarized in this section and are included in Appendix E.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to air quality.

4.2.1 Existing Conditions

4.2.1.1 Meteorological and Topographical Conditions

The Proposed Project is located in the North Central Coast Air Basin (Air Basin), which consists of Monterey, Santa Cruz, and San Benito counties and encompasses an area of 5,159 square miles. The northwest sector of the Air Basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary and, together with the southern extent of the Santa Cruz Mountains, forms the Santa Clara Valley, which extends into the northeastern tip of the Air Basin. Farther south, the Santa Clara Valley merges into the San Benito Valley, which extends northwest–southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to King City at the southeast end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley. The coastal Santa Lucia Range defines the western side of the valley (Monterey Bay Air Resources District [MBARD] 2008). This series of mountain ranges and valleys influences the dispersion of criteria air pollutants through the Air Basin.

The semi-permanent Pacific High pressure cell in the eastern Pacific is the basic controlling factor in the climate of the Air Basin. In the summer, the Pacific High pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High pressure cell forming a stable temperature inversion of hot air over a cool coastal layer of air. As the air currents move onshore, they pass over cool ocean waters and bring fog and relatively cool air into the coastal valleys. The warmer air above acts as a lid to inhibit vertical air movement.

During the summer, the generally northwest–southeast orientation of mountainous ridges tends to restrict and channel the onshore air currents. Elevated ground-surface temperatures in the interior portion of the Salinas and San Benito valleys create a weak low pressure area that intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay Area or the Central Valley into the Air Basin. During the

winter, the Pacific High migrates southward and has less influence on the Air Basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually results in good air quality for the Air Basin in winter and early spring (MBARD 2008).

4.2.1.2 Pollutants and Effects

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The national and California standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following paragraphs. [1]

Ozone

O_3 is a strong-smelling, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly oxides of nitrogen (NO_x) and reactive organic gases (ROGs, also termed volatile organic compounds or VOCs). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3).[2] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to

1 The descriptions of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (EPA 2018a), CARB's Glossary of Air Pollutant Terms (CARB 2019a), and CARB's "Fact Sheet: Air Pollution Sources, Effects and Control" (CARB 2009).

2 The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in and cause shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies of O_3's effects on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2019b).

Nitrogen Dioxide and Oxides of Nitrogen

NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x, which includes NO_2 and nitric oxide, plays a major role, together with ROG, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources of NO_x are transportation and stationary fuel combustion sources (such as electric utility and industrial boilers).

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards (AAQS) for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher levels of exposure compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2019c).

Carbon Monoxide

CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent. Notably, because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots is steadily decreasing.

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2019d).

Sulfur Dioxide

SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects of 1-hour exposure at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part per million [ppm]) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. The elderly and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2019e).

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow

resistance is greater than in healthy people, and it increases with the severity of their asthma (National Research Council of the National Academies [NRC] 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides, NO_x, and ROG.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ is small enough to penetrate deeper into the lungs and damage lung tissue. Suspended particulates also produce haze and reduce regional visibility and damage and discolor surfaces on which they settle.

A number of adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days.[3] These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and

[3] "Restricted activity days" are days that an individual adjusts behavior based on health reasons, such as a work-loss or school-loss day.

respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017).

Lead

Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood, because children are highly susceptible to the effects of lead. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth.

Sulfates

Sulfates are the fully oxidized form of sulfur, which typically occur in combination with metals or hydrogen ions. Sulfates are produced from reactions of SO_2 in the atmosphere and can result in respiratory impairment, as well as reduced visibility.

Vinyl Chloride

Vinyl chloride is a colorless gas with a mild, sweet odor, which has been detected near landfills, sewage plants, and hazardous waste sites, due to the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air can cause nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation can cause liver damage, including liver cancer.

Hydrogen Sulfide

Hydrogen sulfide is a colorless and flammable gas that has a characteristic odor of rotten eggs. Sources of hydrogen sulfide include geothermal power plants, petroleum refineries, sewers, and sewage treatment plants. Exposure to hydrogen sulfide can result in nuisance odors, as well as headaches and breathing difficulties at higher concentrations.

Visibility-Reducing Particles

Visibility-reducing particles are any particles in the air that obstruct the range of visibility. Effects of reduced visibility can include obscuring the viewshed of natural scenery, reducing airport safety, and discouraging tourism. Sources of visibility-reducing particles are the same as for $PM_{2.5}$ described above.

Reactive Organic Gases

Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as ROGs (also referred to as VOCs). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of ROGs result from the formation of O_3 and its related health effects. High levels of ROGs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for ROGs as a group.

Non-Criteria Air Pollutants

Toxic Air Contaminants

A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the California State Legislature (Legislature) in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples of TACs include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced with either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter

Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2019f). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known carcinogenic organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene

(CARB 2019d). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 California Code of Regulations [CCR] Section 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars; and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2019f). Those most vulnerable to non-cancer health effects are children, whose lungs are still developing, and the elderly, who often have chronic health problems.

Odorous Compounds

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. In a phenomenon known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

4.2.1.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. The term "sensitive receptors" is used to refer to facilities and structures where people who are sensitive to air pollution live or spend considerable amounts of time. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards (i.e., preschools and kindergarten through grade 12 schools), parks and playgrounds, daycare centers, nursing homes, hospitals, live in housing (i.e., prisons, dormitories, hospices, or similar), and residential communities (sensitive sites or sensitive land uses) (CARB 2005; MBARD 2008).

Sensitive receptors, predominantly residential uses, are located immediately adjacent to or within close proximity to the Proposed Project pipe sections. Figure 4.10-1 in Section 4.10, Noise and Vibration, shows location of sensitive receptors near the Proposed Project pipe alignments. The Proposed Project alignment traverses several residential neighborhoods and business districts, including those within Ben Lomond and Felton, and residential areas along Graham Hill Road as shown on Figure 4.10-1 in Section 4.10, Noise and Vibration. Several schools and a day care facility are within 0.25 mile of the Project alignment as shown on Figure 4.10-1. The Mountain Monsters Daycare is approximately 0.1 mile east of the proposed alignment. San Lorenzo Valley Elementary School, San Lorenzo Valley Middle School, and San Lorenzo Valley High School are approximately 0.2 mile west of the proposed pipeline alignment in Felton. The Santa Cruz County Juvenile Hall

and Community School is immediately northeast of the pipeline route, along Graham Hill Road, southeast of Felton, and Brook Knoll Elementary School is approximately 0.2 mile east of the pipeline route, along the southern portion of Graham Hill Road.

4.2.1.4 Regional and Local Air Quality Conditions

North Central Coast Air Basin Attainment Designations

Pursuant to the 1990 federal Clean Air Act amendments, the EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as attainment for that pollutant. If an area exceeds the standard, the area is classified as nonattainment for that pollutant. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable." The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards. Similar to the federal Clean Air Act, the California Clean Air Act designated areas as attainment or nonattainment, but based on CAAQS rather than the NAAQS.

Error! Reference source not found. identifies the current attainment status of the Air Basin, including the Proposed Project area, with respect to the NAAQS and CAAQS, and the attainment classifications for the criteria pollutants. The Air Basin is designated as a non-attainment area for the state O_3 and PM_{10} standards. The Air Basin is designated as unclassified or attainment for all other state and federal standards (EPA 2020; CARB 2020). Since the Air Basin has met all NAAQS, it is no longer subject to federal conformity requirements (MBARD 2008).

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across California. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Table 4.2-3 presents the most recent background ambient air quality data from 2018 to 2020. The San Lorenzo Valley Middle School monitoring station, located at 7179 Hacienda Way, Felton, California, is the nearest air quality monitoring station to the project area. This station monitors $PM_{2.5}$. The nearest station that monitors O_3 is the Santa Cruz monitoring station, located at 2544 Soquel Avenue, Santa Cruz, California. The nearest station that monitors CO and NO_2 in the Air Basin is located at 855 E Laurel Drive, Salinas, California. The nearest station that monitors PM_{10} in the Air Basin is located at 1979 Fairview Road, Hollister, California. The data collected at these stations is considered generally representative of the air quality experienced in the vicinity of the Proposed Project. This data is shown in **Error! Reference source not found.** and includes the number of days that the ambient air quality standards were exceeded.

Table 4.2-1. North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
National Standards		
O_3	8 hours	Unclassifiable/Attainment
NO_2	1 hour, annual arithmetic mean	Unclassifiable/Attainment
CO	1 hour; 8 hours	Unclassifiable/Attainment
SO_2	24 hours; annual arithmetic mean	Unclassifiable/Attainment
PM_{10}	24 hours	Unclassifiable/Attainment
$PM_{2.5}$	24 hours; annual arithmetic mean	Unclassifiable/Attainment
Lead	Quarter; 3-month average	Unclassifiable/Attainment
California Standards		
O_3	1 hour; 8 hours	Nonattainment-Transitional
NO_2	1 hour; annual arithmetic mean	Attainment
CO	1 hour; 8 hours	Attainment
SO_2	1 hour; 24 hours	Attainment
PM_{10}	24 hours; annual arithmetic mean	Nonattainment
$PM_{2.5}$	Annual arithmetic mean	Attainment
Lead	30-day average	Attainment
SO_4	24 hours	Attainment
H_2S	1 hour	Unclassified
Vinyl chloride	24 hours	No designation
Visibility-reducing particles	8 hours (10:00 a.m.–6:00 p.m.)	Unclassified

Sources: CARB 2020 (California); EPA 2020 (national).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_4 = sulfates; H_2S = hydrogen sulfide.

Table 4.2-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2018	*2019*	*2020*
Ozone (O_3) – Santa Cruz Monitoring Station				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.075	0.068	0.070
Number of days exceeding state standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.061	0.059	*0.058*
	0.070 ppm (federal)	0.061	0.059	0.057
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Nitrogen Dioxide (NO_2) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	0.18 ppm (state)	0.047	0.030	0.032
	0.100 ppm (federal)	0.047	0.030	0.032
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Annual concentration (ppm)	0.030 ppm (state)	0.005	0.004	0.004
	0.053 ppm (federal)	0.005	0.004	0.004
Carbon Monoxide (CO) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	20 ppm (state)	3.5	35	1.6
	35 ppm (federal)	3.5	35	1.6
Number of days exceeding state standard (days)		*0*	*ND*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	1.2	5.3	1.2
	9 ppm (federal)	1.2	5.3	1.2
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Fine Particulate Matter ($PM_{2.5}$) – San Lorenzo Valley Middle School Monitoring Station				
Maximum 24-hour concentration (µg/m³)	35 µg/m³ (federal)	84.4	16.8	387.8
Number of days exceeding federal standard[a]		*6.5 (6)*	*0.0 (0)*	*19.5 (19)*
Annual concentration (µg/m³)	12 µg/m³ (state)	6.6	4.7	11.2
	12.0 µg/m³ (federal)	6.5	4.7	10.9
Coarse Particulate Matter (PM_{10}) – Hollister Monitoring Station				
Maximum 24-hour concentration (µg/m³)	50 µg/m³ (state)	ND	ND	ND
	150 µg/m³ (federal)	95.9	130.7	159.0
Number of days exceeding state standard[a]		*ND*	*ND*	*ND*
Number of days exceeding federal standard[a]		*0.0 (0)*	*0.0 (0)*	*1.0 (1)*
Annual concentration (state method) (µg/m³)	20 µg/m³ (state)	ND	ND	ND

Sources: CARB 2021; EPA 2021.
Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Table 4.2-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2018	*2019*	*2020*

Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.
Exceedances of national and California standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed national or California standards during the years shown. There is no national standard for 1-hour ozone, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.
San Lorenzo Valley Middle School Monitoring Station is located at 7179 Hacienda Way, Felton, 95018.
Santa Cruz Monitoring Station is located at 2544 Soquel Avenue, Santa Cruz CA 95060.
Salinas Monitoring Station is located at 855 E Laurel Drive, Salinas, 93901.
Hollister Monitoring Station is located at 1979 Fairview Road, Hollister, 95023.

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard. Notably, the California $PM_{2.5}$ standard is based on annual concentrations and does not have daily exceedance information.

4.2.2 Regulatory Framework

4.2.2.1 Federal

Criteria Air Pollutants

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for HAPs to protect public health and welfare. HAPs include certain VOCs, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the

1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

4.2.2.2 State

Criteria Air Pollutants

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. As stated previously, an ambient air quality standard defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below the relevant CAAQS before an air basin can attain the corresponding CAAQS. Air quality is considered in attainment if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

California air districts typically based their thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the air basin can accommodate without affecting the attainment date when attainment will be achieved in the Air Basin for the NAAQS or CAAQS. Thresholds established by air districts are protective of human health, as they are based on attainment of the ambient air quality standards, which reflect the maximum pollutant levels in the outdoor air that would not result in harm to the public's health. Table 4.2-3 presents the NAAQS and CAAQS.

Table 4.2-3. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 µg/m³	—	Same as Primary[f]
	8 hours	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)[f]	
NO_2	1 hour	0.18 ppm (339 µg/m³)	0.100 ppm (137 µg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2	1 hour	0.25 ppm (655 µg/m³)	0.075 ppm (196 µg/m³)[h]	—
	3 hours	—	—	0.5 ppm (1,300 µg/m³)
	24 hours	0.04 ppm (105 µg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}	24 hours	50 µg/m³	150 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m³	—	
$PM_{2.5}$	24 hours	—	35 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m³	12.0 µg/m³[i]	15.0 µg/m³
Lead	30-day Average	1.5 µg/m³	—	
	Calendar Quarter	—	1.5 µg/m³ (for certain areas)[k]	
	Rolling 3-Month Average	—	0.15 µg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m³)	—	—
Vinyl Chloride	24 hours	0.01 ppm (26 µg/m³)[j]	—	—
Sulfates	24 hours	25 µg/m³	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	

Source: CARB 2016.

Notes: ppm = parts per million by volume; µg/m³ = micrograms per cubic meter; mg/m³= milligrams per cubic meter.

[a] California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in 17 CCR Section 70200.

Table 4.2-3. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	*Primary*[c,d]	*Secondary*[c,e]

[b] National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the primary and secondary NAAQS for O_3 were lowered from 0.075 ppm to 0.070 ppm.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated non-attainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. In 1987, the Legislature enacted the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) to address public concern over the release of TACs into the atmosphere. AB 2588 law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, the facility operator is required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines (CARB 2000). The regulation is anticipated to result in an 80-percent decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment Program. These regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment. There are several airborne toxic control measures that reduce diesel emissions, including In-Use Off-Road Diesel-Fueled Fleets (13 CCR Section 2449 et seq.), In-Use On-Road Diesel-Fueled Vehicles (13 CCR Section 2025), and Limit Diesel-Fueled Commercial Motor Vehicle Idling (13 CCR Section 2485).

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property (Health and Safety Code Section 41700). This section also applies to sources of objectionable odors.

4.2.2.2 Regional

Monterey Bay Air Resources District

The Monterey Bay Air Resources District (MBARD) is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the Air Basin, where the Proposed Project is located. The MBARD operates monitoring stations in the Air Basin, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The MBARD's Air Quality Management Plans (AQMPs) include control measures and strategies to be implemented to attain CAAQS and NAAQS in the Air Basin. The MBARD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Air Quality Management Plan

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988, which established specific planning requirements to meet the O_3 standard. The California Clean Air Act requires that the AQMP be updated every 3 years. The most recent update is the *2012–2015 Air Quality Management Plan* (2012–2015 AQMP), which was adopted in March 2017, and is an update to the elements included in the 2012 AQMP. The primary elements updated from the 2012 AQMP are the air quality trends analysis, emission inventory, and mobile source programs.

The Air Basin is a nonattainment area for the CAAQS for both O_3 and PM_{10}. The AQMP addresses only attainment of the O_3 CAAQS. Attainment of the PM_{10} CAAQS is addressed in the MBARD's *2005 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region* (Particulate Matter

Plan), which was adopted in December 2005 and is summarized further below. Maintenance of the 8-hour NAAQS for O_3 is addressed in MBARD's *2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region* (Federal Maintenance Plan), which was adopted in March 2007 and is also summarized below.

A review of the air monitoring data for 2013 through 2015, from the most recent AQMP, indicates that there were fewer exceedance days of O_3 compared to previous periods (MBARD 2017). The long-term trend shows that progress has been made toward achieving O_3 standards. The number of exceedance days has continued to decline during the past 10 years despite population increases. The MBARD's 2012–2015 AQMP identifies a continued trend of declining O_3 emissions in the Air Basin primarily related to lowered vehicles miles traveled (VMT). Therefore, the MBARD determined progress was continuing to be made toward attaining the 8-hour O_3 standard during the three-year period reviewed (MBARD 2017).

Federal Maintenance Plan

The Federal Maintenance Plan (May 2007) presents the strategy for maintaining the NAAQS for O_3 in the Air Basin. It is an update to an earlier maintenance plan (1994) that was prepared for maintaining the 1-hour NAAQS for O_3 and has since been revoked and superseded by the current 8-hour O_3 standard. Effective June 15, 2004, the EPA designated the Air Basin as an attainment area for the 8-hour NAAQS for O_3. The plan includes an emission inventory for the years 1990 to 2030 for ROG and NO_x, the two primary O_3 precursor gases. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (MBARD 2007).

Particulate Matter Plan

The purpose of the Particulate Matter Plan (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction with local air pollution control districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (MBARD 2005). The Particulate Matter Plan's proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the MBARD's smoke management and emission-reduction incentive programs.

Rules and Regulations

The MBARD establishes and administers a program of rules and regulations to attain and maintain state and national air quality standards and regulations related to TACs. Rules and regulations that may apply to the Proposed Project include the following:

- Regulation IV (Prohibitions), Rule 400 (Visible Emissions). This rule provides limits for visible emissions for sources within the MBARD jurisdiction.
- Regulation IV (Prohibitions), Rule 402 (Nuisances). This rule establishes a prohibition against sources creating public nuisances while operating within the MBARD jurisdiction.
- Regulation IV (Prohibitions), Rule 403 (Particulate Matter). This rule provides particulate matter emissions limits for sources operating within the MBARD jurisdiction.

- Regulation IV (Prohibitions), Rule 424 (National Emission Standards for Hazardous Air Pollutions). This rule is to provide clarity on the MBARD's enforcement authority for the National Emission Standards for Hazardous Air Pollution including asbestos from demolition.
- Regulation IV (Prohibitions), Rule 425 (Use of Cutback Asphalt). This rule establishes VOC emissions limits associated with the use of cutback and emulsified asphalts.

4.2.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to air quality. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.2.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to air quality are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Conflict with or obstruct implementation of the applicable air quality plan.
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.
C. Expose sensitive receptors to substantial pollutant concentrations.
D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The MBARD has established thresholds of significance for criteria air pollutants of concern for construction and operations (MBARD 2008). For construction, the threshold is 82 pounds per day of PM_{10}. Construction projects using typical construction equipment such as dump trucks, scrappers, bulldozers, compactors and front-end loaders that temporarily emit other air pollutants, such as precursors of O_3 (i.e., ROG and NO_x), are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the AAQS (MBARD 2008).

For operations, a project would result in a significant impact if it results in the generation of emissions of or in excess of 137 pounds per day for ROG or NO_x, 550 pounds per day of CO, 150 pounds per day of sulfur oxides (SO_x), and 82 pounds per day of PM_{10} from on-site sources (MBARD 2008). As stated above, the Air Basin met all NAAQS. As a result, it is no longer subject to federal conformity requirements (MBARD 2008).

Consistency with the AQMP is used by MBARD to determine a project's cumulative impact on regional air quality (i.e., ozone levels). Projects which are not consistent with the AQMP have not been accommodated in the AQMP and will have a significant cumulative impact on regional air quality unless emissions are totally offset (MBARD 2008). For localized impacts of the Proposed Project (i.e., PM_{10}), the threshold for cumulative impacts is the same as that noted above (82 pounds per day of PM_{10}). The localized impacts related to CO hotspots and

MBARD's associated thresholds are not applicable, as the Proposed Project would not generate a net increase in operational traffic.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The MBARD recommends an incremental cancer risk threshold of 10 in 1 million. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology. In addition, some TACs have noncarcinogenic effects. The MBARD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects.[4]

4.2.3.2 Analytical Methods

This section evaluates the potential impacts to air quality associated with construction and operation of the Proposed Project.

Construction

Proposed construction activities would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment and soil disturbance) and off-site sources (i.e., on-road haul trucks, delivery trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for dust, the prevailing weather conditions. Therefore, emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts.

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions generated during construction of each project pipeline section. CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant emissions associated with construction activities from a variety of land use projects, such as residential, commercial, and industrial facilities.

A construction assumptions scenario was developed for each of the project pipeline sections modeled based on the best available information at this time. Key construction assumptions include phase types, phase timing and duration, off-road equipment use (e.g., type, quantity, and hours of operation per day), number of vehicle trips (e.g., haul trucks, vendor trucks, and worker vehicles) and trip distance, ground disturbance acreage, amount of demolition debris, and paving area. See Appendix E for complete construction assumption details.

A summary of anticipated construction schedules is listed in Table 3-4, Project Construction Assumptions, in Section 3, Project Description. For each of the Proposed Project pipeline alignment sections, the selected phase type and duration were based on the best available information provided by the City and consulting engineers. Phase timing and sequencing was accounted for where two or more phases overlap; the maximum daily emissions was estimated and presented in this analysis.

[4] Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various noncarcinogens from the Project to published reference exposure levels that can cause adverse health effects.

Off-road equipment emissions were estimated in CalEEMod based on the type of equipment, the number of pieces of each equipment, and the hours of operation as provided by the City. Internal combustion engines used by construction equipment would result in emissions of ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

Emissions from vehicle trips were estimated in CalEEMod based on the number of trips, the trip distance, and emission factors for the vehicle category. Regarding the vehicle categories, and consistent with CalEEMod default values, worker trips are assumed to be passenger vehicles and light-duty trucks, vendor truck trips are assumed to be a mix of medium- and heavy-heavy duty trucks, and haul truck trips are assumed to be heavy-heavy duty trucks. Each worker, vendor, and haul truck was estimated to result in two one-way trips. As with equipment, internal combustion engines used by vehicles would result in emissions of ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

Fugitive dust (PM_{10} and $PM_{2.5}$ emissions) is generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, which occurs during earth movement phases (site preparation and grading) and during the loading of material into haul trucks. As discussed in Chapter 3, Project Description, of this EIR, the City has identified standard construction practices that would be implemented by the City or its contractors during construction activities, including wind erosion (dust) controls, such as watering active construction sites, hydroseeding and/or applying non-toxic soil binders to exposed areas after cut and fill activities, covering inactive soil storage piles, covering all trucks hauling loose materials (such as dirt and sand) off-site, and installing appropriate track-out capture methods for exiting trucks. These measures would limit the potential for fugitive dust generation.

VOC off-gassing emissions would occur during application of asphalt pavement when repaving disturbed areas in roadways. During paving, ROG off-gassing emissions are estimated in CalEEMod based on the area of asphalt pavement assumed and the default emission factor of 2.62 pounds per acre of VOC.

Operation

Once Proposed Project construction is complete, operations would be similar to existing conditions and would not require an increase in on-road vehicle trips associated with routine inspection and maintenance by City staff. As such, no additional sources of air pollutants are anticipated during long-term operations.

Application of Relevant Standard Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize effects to air quality. These practices and their effectiveness in avoiding and minimizing effects are described below.

Standard Construction Practice #1 requires implementation of erosion control best management practices, such as silt fences, fiber or straw rolls, and/or bales; covering of stockpiled spoils; revegetation and physical stabilization of disturbed areas; and sediment-control fencing, dams, barriers, berms, traps, and basins, for activities occurring in or adjacent to jurisdictional aquatic resources. Standard Construction Practice #2 requires stockpile containment and use of exposed soil stabilization structures. Standard Construction Practice #3 requires use of runoff control devices to be used during construction during the rainy season, and inspection of such devices following rain events. Standard Construction Practice #4 requires implementation

of wind erosion (dust) controls. These practices that would be implemented by the City or its contractors during construction activities would be effective at limiting the potential for fugitive dust generation.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event that adverse environmental impacts would occur even with consideration of applicable policies and regulations and the Standard Construction Practices described in Chapter 3, Project Description, mitigation measures are provided to reduce impacts to less-than-significant levels.

4.2.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would have no impacts with respect to the following thresholds of significance as described below.

- **Conflict with AQMP (Significance Threshold A).** As described in the MBARD CEQA Guidelines (2008), project emissions that are not accounted for in the AQMP's emission inventory are considered a significant cumulative impact to regional air quality. However, construction exhaust emissions are accounted for in the AQMP emissions inventory (MBARD 2018), and therefore Proposed Project construction emissions would not conflict with the AQMP. Regarding long-term operations, the Proposed Project would not result in an increase in criteria air pollutants as operations and maintenance are expected to remain the same as currently exist. In addition, the Proposed Project is not population inducing and would not conflict with the Association of Monterey Bay Area Governments (AMBAG) population projections incorporated in the AQMP. As such, construction and operation of the Proposed Project would not conflict with or obstruct implementation of the AQMP, resulting in no impact. Furthermore, as determined in Impact AIR-1 (discussed below), the Proposed Project would result in emissions during short-term construction that would not exceed the MBARD thresholds of significance.

Project Impacts

Impact AIR-1: **Criteria Pollutant Emissions (Significance Threshold B).** The Proposed Project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Project would not 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. ***(Less than Significant)***

Short-term construction of the Proposed Project would result in a minimal increase in daily criteria air pollutant emissions and would not exceed the applicable MBARD thresholds. As such, the Proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is non-attainment under an applicable federal or state ambient air quality standard. This impact would be less than significant, as further explained below.

Construction Emissions

Construction emissions associated with the Proposed Project were estimated and are depicted in Table 4.2-4. As shown in Table 4.2-4, maximum daily emissions of PM_{10} associated with construction of the Proposed Project would not exceed the applicable MBARD significance threshold. Therefore, construction emissions would result in a less-than-significant impact.

Operational Emissions

As indicated in Section 4.2.3.2, Analytical Methods, once Proposed Project construction is complete, operations would be similar to existing conditions. Therefore, no additional sources of air pollutants are anticipated during long-term operations.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to criteria air pollutant emissions, and therefore, no mitigation measures are required.

Table 4.2-4. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2022	10.76	96.64	133.54	0.25	14.16	6.44
2023	1.77	42.97	21.13	0.14	4.57	1.55
2024	39.57	49.00	21.42	0.16	5.03	1.78
2025	0.20	3.98	1.51	0.01	0.42	0.15
2030	180.75	9.93	11.49	0.04	1.21	0.48
2031	90.53	17.36	17.66	0.07	2.26	0.83
Maximum daily emissions	**180.75**	**96.64**	**133.54**	**0.25**	**14.16**	**6.44**
MBARD threshold[a]	*N/A*	*N/A*	*N/A*	*N/A*	*82*	*N/A*
Threshold exceeded?	**N/A**	**N/A**	**N/A**	**N/A**	**No**	**N/A**

Notes: AAQS = Ambient Air Quality Standard; CO = carbon monoxide; MBARD = Monterey Bay Air Resources District; N/A = not applicable; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; ROG = reactive organic gases; SO_x = sulfur oxides.
See Appendix E for details. The values shown are the maximum summer or winter daily emissions results from CalEEMod and include watering of exposed areas two times per day, per the City's Standard Construction Practices.

[a] For construction, the threshold is 82 pounds per day of PM_{10}. MBARD has not adopted quantitative thresholds for the other criteria air pollutants since construction projects using typical construction equipment such as dump trucks, scrappers, bulldozers, compactors and front-end loaders that temporarily emit other air pollutants are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the AAQS (MBARD 2008).

Impact AIR-2: Exposure of Sensitive Receptors (Significance Threshold C). The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations. (***Less than Significant***)

Health Effects of Criteria Air Pollutants

ROG and NO_x are precursors to O_3, for which the Air Basin is designated as nonattainment with respect to the CAAQS. The health effects associated with O_3 are generally related to reduced lung function. The contribution of ROG and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the Air Basin due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the precursor emissions would occur because exceedances of the O_3 AAQS tend to occur between April and October when solar radiation is highest. The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of reliable and meaningful quantitative methods to assess this impact. This is particularly true of a project with less-than-significant emissions of precursors to O_3. The Proposed Project would generate ROG and NO_x exhaust emissions from typical construction activities, which are already accounted for in the emissions inventories of the state- and federally required air plans, and would not have a significant impact on the attainment and maintenance of the O_3 AAQS or result in potential health effects associated with O_3.

Construction and operation of the Proposed Project would not contribute to exceedances of the NAAQS and CAAQS for NO_2, which is a constituent of NO_x. This is due to the project's NO_x emissions already being captured in federal and state inventories and associated reduction measures set forth in the applicable air plans, as stated previously. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards and construction and operation of the Proposed Project would not create substantial, localized NO_x impacts. Therefore, the Proposed Project is not anticipated to result in potential health effects associated with NO_2 and NO_x.

Mobile source impacts occur on two scales of motion. Regionally, project-related travel would add to regional trip generation and increase the VMT within the local airshed and the Air Basin. Locally, project-generated traffic would be added to the roadway system near the pipeline section sites during construction. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of substantially elevated and localized CO emissions, such as around congested intersections. During construction, the Proposed Project would result in CO emissions from construction worker vehicles, haul trucks, and off-road equipment. Title 40, Section 93.123(c)(5) of the California Code of Regulations, Procedures for Determining Localized CO, PM_{10}, and $PM_{2.5}$ Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (40 CCR Section 93.123). Since construction activities would be temporary for each project pipeline section, a construction hotspot analysis would not be required. Further, the Proposed Project would not result in additional traffic trips during operation

and therefore would not exceed the MBARD CO screening criteria resulting in the formation of potential CO hotspots. Thus, the Proposed Project's CO emissions would not contribute to significant health effects at nearby sensitive receptors.

As depicted in Table 4.2-4 above, construction and operation of the Proposed Project would result in minimal emissions of PM_{10} and $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the Air Basin from coming into attainment for these pollutants. Since PM_{10} is representative of the levels of DPM, the Proposed Project also would not result in substantial DPM emissions during construction and operation, and therefore, would not result in significant health effects related to DPM exposure. Due to the minimal contribution of PM_{10} and $PM_{2.5}$ during construction, it is not anticipated that the Proposed Project would result in potential health effects related to particulate matter.

The California Supreme Court's *Sierra Club v. County of Fresno* (2018) 6 Cal. 5th 502 decision (referred to herein as the Friant Ranch decision) (issued on December 24, 2018), addresses the need to "substantively connect" mass emission values for criteria air pollutants to specific health consequences, and contains the following direction from the California Supreme Court: "The Environmental Impact Report (EIR) must provide an adequate analysis to inform the public how its bare numbers translate to create potential adverse impacts or it must explain what the agency *does* know and why, given existing scientific constraints, [if] it cannot translate potential health impacts further." (Italics original.) (Sierra Club v. County of Fresno 2018.) As this statement suggests, an EIR may deal adequately with the question of attempting to connect air pollutant emissions with human health effects if the EIR "adequately explains why it is not scientifically feasible at the time of drafting to provide such an analysis." (*Id.*) Currently, the MBARD, CARB, and EPA have not approved a quantitative method to reliably, meaningfully, and consistently translate the mass emission estimates for the criteria air pollutants resulting from the Proposed Project to specific health effects. In addition, there are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days.

In connection with the judicial proceedings culminating in issuance of the Friant Ranch decision, the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD) filed amicus briefs attesting to the extreme difficulty of correlating an individual project's criteria air pollutant emissions to specific health impacts. Both SJVAPCD and SCAQMD have among the most sophisticated air quality modeling and health impact evaluation capabilities of the air districts in California. The key, relevant points from SCAQMD and SJVAPCD briefs are summarized herein.

In requiring a health impact type of analysis for criteria air pollutants, it is important to understand how O_3 and particulate matter are formed, dispersed, and regulated. The formation of O_3 and particulate matter in the atmosphere, as secondary pollutants,[5] involves complex chemical and physical interactions of multiple pollutants from natural and anthropogenic sources. The O_3 reaction is self-perpetuating (or catalytic) in the presence of sunlight because NO_2 is photochemically reformed from nitric oxide. In this way, O_3 is controlled by both NO_x and ROG emissions (NRC 2005). The complexity of these interacting cycles of pollutants means that incremental decreases in one emission may not result in proportional decreases in O_3 (NRC 2005). Although these reactions and interactions are well understood, variability in emission source operations and meteorology creates uncertainty in the modeled O_3 concentrations to which downwind populations may be exposed (NRC 2005). Once formed, O_3 can be transported long distances by wind, and due to atmospheric

[5] Air pollutants formed through chemical reactions in the atmosphere are referred to as secondary pollutants.

transport, contributions of precursors from the surrounding region can also be important. Because of the complexity of O_3 formation, a specific tonnage amount of ROG or NO_x emitted in a particular area does not equate to a particular concentration of O_3 in that area (SJVAPCD 2015). Particulate matter can be divided into two categories: directly emitted particulate matter and secondary particulate matter. Secondary particulate matter, like O_3, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as SO_x and NO_x (SJVAPCD 2015). Because of the complexity of secondary particulate matter formation, including the potential to be transported long distances by wind, the tonnage of particulate matter-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary particulate matter in that area (SJVAPCD 2015). This is especially true for individual projects, like the Proposed Project, where project-generated criteria air pollutant emissions are not derived from a single "point source," but from construction equipment and mobile sources (passenger cars and trucks) driving to, from and around the alignment sites.

Another important technical nuance is that health effects from air pollutants are related to the concentration of the air pollutant that an individual is exposed to, not necessarily the individual mass quantity of emissions associated with an individual project. For example, health effects from O_3 are correlated with increases in the ambient level of O_3 in the air a person breathes (SCAQMD 2015). However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient O_3 levels over an entire region (SCAQMD 2015). The lack of link between the tonnage of precursor pollutants and the concentration of O_3 and $PM_{2.5}$ formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects; rather, it is the concentration of resulting O_3 that causes these effects (SJVAPCD 2015). Indeed, the AAQS, which are statutorily required to be set by EPA at levels that are requisite to protect the public health, are established as concentrations of O_3 and $PM_{2.5}$ and not as tonnages of their precursor pollutants (EPA 2018b). Because the ambient air quality standards are focused on achieving a particular concentration region-wide, the tools and plans for attaining the ambient air quality standards are regional in nature. For CEQA analyses, project-generated emissions are typically estimated in pounds per day or tons per year and compared to mass daily or annual emission thresholds. While CEQA thresholds are established at levels that the air basin can accommodate without affecting the attainment date for the AAQS, even if a project exceeds established CEQA significance thresholds, this does not mean that one can easily determine the concentration of O_3 or particulate matter that will be created at or near the project site on a particular day or month of the year, or what specific health impacts will occur (SJVAPCD 2015).

In regard to regional concentrations and air basin attainment, the SJVAPCD emphasized that attempting to identify a change in background pollutant concentrations that can be attributed to a single project, even one as large as the entire Friant Ranch Specific Plan, is a theoretical exercise. The SJVAPCD brief noted that it "would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have" (SJVAPCD 2015). The situation is further complicated by the fact that background concentrations of regional pollutants are not uniform either temporally or geographically throughout an air basin, but are constantly fluctuating based upon meteorology and other environmental factors. SJVAPCD noted that the currently available modeling tools are equipped to model the impact of all emission sources in the San Joaquin Valley Air Basin on attainment (SJVAPCD 2015). The SJVAPCD brief then indicated that, "Running the photochemical grid model used for predicting O_3 attainment with the emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NO_x and VOC in the Valley) is not likely to yield valid information given the relative scale involved" (SJVAPCD 2015).

SCAQMD and SJVAPCD have indicated that it is not feasible to quantify project-level health impacts based on existing modeling (SCAQMD 2015; SJVAPCD 2015). Even if a metric could be calculated, it would not be reliable because the models are equipped to model the impact of all emission sources in an air basin on attainment and would likely not yield valid information or a measurable increase in O_3 concentrations sufficient to accurately quantify O_3-related health impacts for an individual project.

Nonetheless, following the Supreme Court's Friant Ranch decision, some EIRs where estimated criteria air pollutant emissions exceeded applicable air district thresholds have included a quantitative analysis of potential project-generated health effects using a combination of a regional photochemical grid model (PGM)[6] and the EPA Benefits Mapping and Analysis Program (BenMAP or BenMAP–Community Edition [CE])[7]. The publicly available health impact assessments (HIAs) typically present results in terms of an increase in health incidences and/or the increase in background health incidence for various health outcomes resulting from the project's estimated increase in concentrations of O_3 and $PM_{2.5}$.[8] To date, the five publicly available HIAs have concluded that the evaluated project's health effects associated with the estimated project-generated increase in concentrations of O_3 and $PM_{2.5}$ represent a small increase in incidences and a very small percent of the number of background incidences, indicating that these health impacts are negligible and potentially within the models' margin of error. It is also important to note that while the results of the five available HIAs conclude that the project emissions do not result in a substantial increase in health incidences, the estimated emissions and assumed toxicity is also conservatively inputted into the HIA and thus, overestimate health incidences, particularly for $PM_{2.5}$.

As explained in the SJVAPCD brief and noted previously, running the PGM used for predicting O_3 attainment with the emissions solely from an individual project like the Friant Ranch project or the Proposed Project is not likely to yield valid information given the relative scale involved. The five available HIAs support the SJVAPCD's brief contention that consistent, reliable, and meaningful results may not be provided by methods applied at this time. Accordingly, additional work in the industry and more importantly, air district participation, is needed to develop a more meaningful analysis to correlate project-level mass criteria air pollutant emissions and health effects for decision makers and the public. Furthermore, at the time of writing, every HIA has concluded that health effects estimated using the PGM and BenMAP approach are not substantial and are even potentially within the models' margin of error.

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6 The first step in the publicly available HIAs includes running a regional PGM, such as the Community Multiscale Air Quality (CMAQ) model or the Comprehensive Air Quality Model with extensions (CAMx) to estimate the increase in concentrations of O_3 and $PM_{2.5}$ as a result of project-generated emissions of criteria and precursor pollutants. Air districts, such as the SCAQMD, use photochemical air quality models for regional air quality planning. These photochemical models are large-scale air quality models that simulate the changes of pollutant concentrations in the atmosphere using a set of mathematical equations characterizing the chemical and physical processes in the atmosphere (EPA 2017).

7 After estimating the increase in concentrations of O_3 and $PM_{2.5}$, the second step in the five examples includes use of BenMAP or BenMAP-CE to estimate the resulting associated health effects. BenMAP estimates the number of health incidences resulting from changes in air pollution concentrations (EPA 2018b). The health impact function in BenMAP-CE incorporates four key sources of data: (i) modeled or monitored air quality changes, (ii) population, (iii) baseline incidence rates, and (iv) an effect estimate. All of the five example HIAs focused on O_3 and $PM_{2.5}$.

8 The following CEQA documents included a quantitative HIA to address the requirements of the Friant Ranch decision: (1) California State University Dominguez Hills 2018 Campus Master Plan EIR (CSU Dominguez Hills 2019), (2) March Joint Powers Association K4 Warehouse and Cactus Channel Improvements EIR (March JPA 2019), (3) Mineta San Jose Airport Amendment to the Airport Master Plan EIR (City of San Jose 2019), (4) City of Inglewood Basketball and Entertainment Center Project EIR (City of Inglewood 2019), and (5) San Diego State University (SDSU) Mission Valley Campus Master Plan EIR (SDSU 2019).

In summary, because construction and/or operation of the Proposed Project would not result in the emissions of criteria air pollutants that would exceed the applicable MBARD significance thresholds, and because the MBARD thresholds are based on levels that the Air Basin can accommodate without affecting the attainment date for the AAQS and the AAQS are established to protect public health and welfare, the Proposed Project would not result in health effects associated with criteria air pollutants and the impact would be less than significant.

Toxic Air Contaminants

TACs are defined as substances that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and is adopting appropriate control measures for sources of these TACs. During Proposed Project construction, DPM would be the primary TAC emitted from diesel-fueled equipment and trucks. The following measures are required by state law to reduce DPM emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-Road Diesel Vehicles (13 CCR Chapter 9, Section 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.

Sensitive receptors are located immediately adjacent to or within close proximity to the project alignments. Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The MBARD recommends an incremental cancer risk threshold of 10 in 1 million. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment (OEHHA) risk-assessment methodology (OEHHA 2015). In addition, some TACs have noncarcinogenic effects. The MBARD recommends a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) effects.[9]

DPM emissions would be emitted from heavy equipment operations and diesel-fueled trucks. Heavy-duty construction equipment and commercial trucks are subject to CARB Air Toxic Control Measures to reduce diesel particulate emissions. As described in Table 4.2-4 above, maximum daily total PM_{10} emissions generated by construction equipment operation and trucks (exhaust particulate matter, or DPM, combined with fugitive dust generated by equipment operation and vehicle travel), would be well below the MBARD significance threshold. Moreover, construction of each of the pipeline sections would be short term, after which project-related TAC emissions (e.g., diesel emissions) would cease. Since the Proposed Project would result in linear construction, construction would proceed along the alignments and would not require the extensive use of heavy-duty construction equipment or diesel trucks in any one location over the duration of development,

[9] Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various noncarcinogens from the Proposed Project to published reference exposure levels that can cause adverse health effects.

which would limit the exposure of any proximate individual sensitive receptor to TACs. No long-term sources of TAC emissions, such as diesel generators or substantial vehicle traffic, are anticipated during operation of the Proposed Project. Due to the relatively short period of exposure at any individual sensitive receptor and minimal particulate emissions generated, TACs emitted during construction would not be expected to result in concentrations causing significant health risks, which would be a less-than-significant impact.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to exposure of sensitive receptors to substantial pollutant concentrations, and therefore, no mitigation measures are required.

Impact AIR-3: Result in Other Emissions (Odors) Adversely Affecting a Substantial Number of People (Significance Threshold D). The Proposed Project would not result in other emissions that would adversely affect a substantial number of people. ***(Less than Significant)***

The occurrence and severity of potential odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Odors would be potentially generated from vehicles and equipment exhaust emissions during Proposed Project construction. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment and asphalt pavement application. Such odors would disperse rapidly from the pipeline section sites and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be less than significant.

Typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries. Regarding operations, the Proposed Project involves improvements to pipeline infrastructure and any odors produced would be minimal and similar to existing conditions. Overall, the Proposed Project would not result in odors that would affect a substantial number of people. Therefore, impacts associated with odors during operation would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to other emissions such as odors, and therefore, no mitigation measures are required.

4.2.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative air quality impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses. The entire Air Basin is the geographic context for the evaluation of cumulative air quality impacts related to substantial pollutant concentrations and related health effects.

Air Quality Management Plan

As described under Impact AIR-1, project emissions that are not accounted for in the AQMP's emission inventory are considered to have a significant cumulative impact to regional air quality (MBARD 2008). The Proposed Project would not result in long-term operational emissions as operation and maintenance activities would remain as currently exist. The Proposed Project would result in construction-related emissions. However, construction exhaust emissions are accounted for in the AQMP emissions inventory (MBARD 2018). Since the Proposed Project would result in typical construction activities, it would generate exhaust emissions that are accounted for in the AQMP. Therefore, the Proposed Project would not contribute to potential cumulative impacts due to conflicts with MBARD's AQMP.

Impact AIR-4: Cumulative Air Quality Impacts (Significance Thresholds B, C, and D). The Proposed Project emissions, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to air quality, and the Proposed Project's contribution would not be cumulatively considerable. ***(Less than Significant)***

Criteria Air Pollutants

By its nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and the MBARD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. The potential for the Proposed Project to result in a cumulatively considerable impact, specifically a cumulatively considerable new increase of any criteria air pollutant for which the project region is nonattainment under an applicable NAAQS and/or CAAQS, is addressed in Impact AIR-1. As previously discussed, the Proposed Project would not exceed the MBARD significance thresholds for any criteria air pollutant, and would not result in operational emissions. Therefore, the Proposed Project's construction-related emissions and contribution to air quality impacts would not be cumulatively considerable.

Substantial Pollutant Concentrations

As indicated above, the entire Air Basin is the geographic context for the evaluation of cumulative air quality impacts related to substantial pollutant concentrations and related health effects. There are numerous scientific and technological complexities associated with correlating criteria air pollutant emissions from an individual project to specific health effects or potential additional nonattainment days, and there are currently no modeling tools that could provide reliable and meaningful additional information regarding health effects from criteria air pollutants generated by individual projects. As addressed in Impact AIR-2, construction and operation of the Proposed Project would not result in the exceedances of the MBARD significance thresholds, and the MBARD thresholds are based on levels that the Air Basin can accommodate without affecting the attainment date for the AAQS, which are established to protect public health and welfare

TACs have a localized impact, with the geographic context consisting of sensitive receptors proximate[10] to Proposed Project alignments. However, as described under Impact AIR-2, construction of each of these pipeline sections would be short term, after which project-related TAC emissions would cease. Furthermore, no long-term sources of TAC emissions are anticipated during operation of the Proposed Project. Even with consideration of cumulative projects, due to the relatively short period of exposure at any individual sensitive receptor and minimal DPM emissions generated by the Proposed Project, TACs emitted by the Proposed Project development would not be substantial. Therefore, the Proposed Project's construction-related emissions would not be cumulatively considerable related to substantial pollutant concentrations.

Odors

Odors are a localized impact. As indicated in Impact AIR-3, the Proposed Project's impact related to odor would be less than significant. Since the MBARD does not have a specific regulation or rule that addresses objectionable odors, any actions related to odors would be based on public complaints made to the MBARD. Additionally, all future projects, including those listed Table 4.0-1 in Section 4.0, Introduction to Analyses, would be subject to MBARD Rule 402 (Nuisances), which prohibits the discharge of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or which endanger the comfort, repose, health, or safety of any such persons or the public; or which cause, or have a natural tendency to cause, injury or damage to business or property. Furthermore, none of known cumulative projects involve land uses that would typically result in substantial odors. Therefore, cumulative impacts related to generation of odors would not be significant.

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[10] The Bay Area Air Quality Management District (BAAQMD) identifies a 1,000 feet radius as the geographic context to evaluate health risk impacts, including on a cumulative basis (BAAQMD 2017). MBARD does not have a similar defined radial zone of impact.

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4.3 Biological Resources

This section describes the existing biological resources of the Proposed Project sites and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on a Biological Resources Assessment (BRA, Dudek 2021) that is included in Appendix B. The BRA includes a Sandhills Habitat Assessment (McGraw 2021a) and focused botanical survey (McGraw 2021b) prepared for the Proposed Project. Data regarding biological resources present within the Proposed Project sites were obtained through a review of pertinent literature, field reconnaissance, an aquatic resources jurisdictional delineation, and habitat assessments. This section summarizes results of the BRA; see Appendix B for further details.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to biological resources.

4.3.1 Existing Conditions

4.3.1.1 Study Area

A biological study area (BSA) was established to analyze potential impacts resulting from implementation of the Proposed Project. The BSA includes the construction disturbance areas identified for the pipeline sections, including identified staging areas, within the Northern Segment (Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, San Lorenzo Way, and Felton Pump Station) and Southern Segment (San Lorenzo Lumber Yard, Henry Cowell State Park, Pipeline Road, Graham Hill Road North, and Graham Hill Road South), plus a 300-foot buffer on both sides of the centerline. The BSA includes a total of 982.82 acres and includes the existing pipeline segments in addition to the proposed alignments. The construction disturbance areas for each proposed pipe section are identified in Section 3.5.2, Description of Pipeline Segments.

4.3.1.2 Vegetation Communities and Land Covers

The BSA supports a total of 17 natural vegetation communities and 5 land covers. Figures 3-1 to 3-18 in Appendix B illustrate the distribution of vegetation communities and land covers for the northern and southern segments, respectively. Table 4.3-1 on the next page summarizes the extent of vegetation communities and land covers within the BSA. Descriptions of these vegetation communities and land covers are provided in Appendix B. Approximately 620 acres within the BSA are native vegetation communities, and the prominent communities are redwood forest and woodland (30%), ponderosa pine forest and woodland (20%), and coast live oak woodland and forest (15%). The BRA recorded 115 species of native or naturalized plants, consisting of 88 native (77%) and 27 non-native (23%) species during vegetation community mapping and biological reconnaissance surveys. Full lists of plant species observed are provided in Appendix B.

A total of 37 wildlife species, consisting of 35 native species (95%) and 2 non-native species (5%), were recorded within the BSA during surveys. A full list of observed wildlife species by taxonomic group is provided in Appendix B.

Table 4.3-1. Vegetation Communities and Land Covers within the Biological Study Area

Vegetation Alliance (Common Name) or Land Cover	Project Sections Where Found	Area (acres)
Forest and Woodland Alliances and Stands		
Bigleaf maple forest and woodland (BMFW)	Newell Creek Road, Brackney North, Brackney South	2.7
Black cottonwood forest and woodland (BCFW)	Graham Hill Road North	1.8
Box-elder forest and woodland (BFW)	Graham Hill Road North	2.4
California bay forest and woodland (CBFW)	Newell Creek Road, Brackney North, Brackney South, San Lorenzo Way	20.9
California sycamore woodland (CSW)	San Lorenzo Way, Felton Pump Station	12.0
Coast live oak woodland and forest (CLO)	All, except Brackney North	90.1
Douglas fir - tanoak forest and woodland (DF-TFW)	Existing NCP-Pipeline Road	4.5
Douglas fir forest and woodland (DFFW)	Brackney North, Brackney South, Graham Hill Road South, Existing NCP-Pipeline Road	43.6
Mixed oak forest and woodland (MOFW)	Newell Creek road, Brackney North, San Lorenzo Way, Existing NCP-Pipeline Road	54.9
Ponderosa pine forest and woodland (PPFW)	Graham Hill Road North, Graham Hill Road South, Existing NCP-Pipeline Road	125.0
Redwood forest and woodland (RFW)	All, except Felton Pump Station	186.4
White alder groves (WAG)	Newell Creek road, Felton Pump Station, Graham Hill Road North	13.8
Subtotal Forest and Woodland Alliances and Stands		*558.1*
Shrubland Alliances and Stands		
Coastal brambles (COB)	Glen Arbor Road, Brackney North	0.4
Coyote brush scrub (CYS)	Newell Creek Road, San Lorenzo Way, Felton Pump Station	6.5
Poison oak scrub (POS)	Brackney South	1.9
Silverleaf manzanita chaparral (SMC)	Newell Creek Road, Glen Arbor Road, Graham Hill Road North	44.0
Subtotal Shrubland Alliances and Stands		*52.8*
Herbaceous Alliances and Stands		
Wild oats and annual brome grasslands (WOABG)	San Lorenzo Way, Graham Hill Road South	7.1
Subtotal Herbaceous Alliances and Stands		*7.1*
Non-natural Land Covers/Unvegetated Communities		
Dirt Road (DRD)	Brackney North, Brackney South, San Lorenzo Way, Graham Hill North	3.4
Disturbed Habitat (DH)	Newell Creek Road, Brackney South, San Lorenzo Way, Felton Pump Station, Graham Hill Road North & South	40.7
Parks (PARK)	Felton Pump Station, Graham Hill North	4.9
Rural residential (DEV-RR)	All, except Existing NCP-Pipeline Road	230.4
Urban/Developed (DEV)	All, except Brackney North	85.7
Subtotal Non-Natural Land Covers/Unvegetated Communities	-	*365.1*
Total	-	**983.1**

4.3.1.3 Special-Status Species

Special-status species include those plants and animals that have been formally listed or proposed for listing as endangered or threatened under either the state or federal Endangered Species Acts; candidates for either state or federal listing; species that meet the definition of rare or endangered under CEQA Guidelines Section 15380; animals designated by the CDFW to be Species of Special Concern (SSC); animals designated by the California Fish and Game Code as fully protected species; plants listed as rare under the California Native Plant Protection Act of 1977; and plants with California Rare Plant Ranks (CRPR) of 1A, 1B, 2A, or 2B.

Special-Status Plants

Based on the results of the literature review and database searches, 59 special-status plant species were identified as potentially occurring in the BSA. Of these, 31 species are not expected to occur due to the absence of suitable habitat or because the BSA is outside the known range of the species, and 12 species are considered to have low potential to occur based on the presence of low-quality habitat. There is no USFWS-designated critical habitat for listed plant species within the BSA.

A total of seven species were determined to have a moderate potential to occur in the BSA based on the soils, vegetation communities (habitat) present, elevation range, and previous known locations based on the California Natural Diversity Database (CNDDB), USFWS Information for Planning and Consultation (IPaC), and CNPS Inventory: Anderson's manzanita (*Arctostaphylos andersonii*), deceiving sedge (*Carex saliniformis*), Kellogg's horkelia (*Horkelia cuneata* var. *sericea*), Point Reyes horkelia (*Horkelia marinensis*), robust spineflower (*Chorizanthe robusta* var. *robusta*), Santa Cruz wallflower, and tear drop moss (*Dacryophyllum falcifolium*). The remaining nine species were either observed or determined to have a high potential to occur in the BSA. These species are summarized in Table 4.3-2 and discussed below.

The focused botanical surveys conducted in 2021 along three of the pipeline sections proposed for the first phase of project implementation (Brackney North, Graham Hill Road North, and Graham Hill Road South) documented the occurrence of three special-status plants: Ben Lomond buckwheat (*Eriogonum nudum var. decurrens*), Ben Lomond spineflower, and silverleaf (Bonny Doon) manzanita. No special status species were identified in the Brackney North section during the focused botanical surveys.

Observed Special-Status Plant Species

Silverleaf (Bonny Doon) manzanita (*Arctostaphylos silvicola*) is a shrub with a CRPR of 1B.2 that occurs in closed-cone coniferous forest, chaparral, lower montane coniferous forest, and inland marine sands/perennial evergreen shrub. The species was observed in the Graham Hill Road North section. Suitable forest and shrub habitat also are present within the BSA in the Newell Creek Road and Glen Arbor Road sections and in the Pipeline Road section of the existing NCP (McGraw, 2021b). As noted above, this species was observed along the ROW during the 2021 habitat assessment and focused botanical surveys.

Table 4.3-2. Special-Status Plant Species Observed or with a High Potential to Occur Within the Biological Study Area

Scientific Name	Common Name	Federal/State/CRPR	Potential to Occur*
Arctostaphylos silvicola	Silverleaf (Bonny Doon) manzanita	None/None/1B.2	Observed
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	FE/None/1B.1	Observed
Eriogonum nudum var. decurrens	Ben Lomond buckwheat	None/None/1B.1	Observed
Fissidens pauperculus	minute pocket moss	None/None/1B.1	High
Holocarpha macradenia	Santa Cruz tarplant	FT/SE/1B.1	High
Monardella sinuate ssp. nigrescens	northern curly-leaved monardella	None/None/1B.2	High
Monolopia gracilens	woodland woolythreads	None/None/1B.2	High
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	None/None/1B.2	High
Plagiobothrys diffuses	San Francisco popcornflower	None/SE/1B.1	High

Source: CDFW 2021a; CNPS 2021.

Status Legend

***** Although the BSA provides potential habitat, the proposed work areas do not generally support suitable habitat for these species due to the disturbed and developed nature of the ROW.

Federal

FE: Federally listed as endangered

FT: Federally listed as threatened

State

SE: State listed as endangered

CRPR (California Rare Plant Rank)

List 1B: Plants rare, threatened, or endangered in California and elsewhere

Threat Rank:

.1 Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2 Fairly endangered in California (20% to 80% of occurrences threatened)

Ben Lomond spineflower is an annual herb that is federally endangered with a CRPR of 1B.1. It occurs in lower montane coniferous forest (maritime ponderosa pine Sandhills). Suitable forest habitat and sandhill soils are present within all portions of the BSA, except for the Graham Hill Road South section. As noted above, this species was observed during the 2021 focused botanical surveys and was found along an approximately 4,100-foot-long portion of the Graham Hill Road North section that traverses Sandhills habitat. Ben Lomond spineflower occupies 10 patches totaling 294 square feet (sf), which contain a total of 1,320 individuals. This species also has a high potential of occurrence in the Newell Creek Road section (McGraw 2021a).

Ben Lomond buckwheat (*Eriogonum nudum var. decurrens)* is a perennial herb with a CRPR of 1B.1 that occurs on sandy soils within chaparral, cismontane woodland, and lower montane woodland coniferous forest (maritime ponderosa pine Sandhills). This species was observed in the Graham Hill Road North section of the BSA, but outside of the project work area. This species also has a high potential of occurrence in the Newell Creek Road section (McGraw 2021a).

Other Special-Status Plant Species with High Potential to Occur

Minute pocket moss (*Fissidens pauperculus*) is a bryophyte (moss) with a CRPR of 1B.2. This species occurs in north coast coniferous forests. The BSA supports suitable habitat for this species in all of the pipe sections due to the prevalence of coniferous forest and riparian habitat. The CNDDB lists two occurrences within Santa Cruz County.

Santa Cruz tarplant (*Holocarpha macradenia*) is an annual herb that is listed as federally threatened and state endangered with the CRPR of 1B.1. It occurs in coastal prairie, coastal scrub, valley and foothill grassland habitats. The BSA supports grasslands within the San Lorenzo Way and Graham Hill Road South sections, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP that may provide suitable habitat for this species. The CNDDB lists 14 occurrences documented in the vicinity of Santa Cruz and Aptos.

Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*) is an annual herb with the CRPR of 1B.2. It occurs in sandy soils in coastal dune, coastal scrub, and lower montane coniferous forest habitats. Marginally suitable to suitable scrub, woodland, grassland, and/or Ponderosa pine sandhill habitat is present throughout the BSA, including San Lorenzo Way, Graham Hill Road North, Graham Hill Road South, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP. The closest CNDDB occurrence was documented immediately to the northeast of the BSA in 1993.

Woodland woolythreads (*Monolopia gracilens*) is an annual herb with the CRPR of 1B.1. It occurs on serpentine soils in openings within broadleafed upland forests, chapparal, cismontane woodland, north coast coniferous forests and foothill grassland. The BSA supports suitable forest and grassland habitat for this species within the Newell Creek Road, Glen Arbor Way, San Lorenzo Way, Graham Hill Road North, and Graham Hill Road South sections. The CNDDB lists 31 occurrences throughout Santa Cruz County.

Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*) is an annual herb with the CRPR of 1B.1. It occurs in mesic conditions within chaparral, coastal prairie, and coastal scrub. The BSA supports suitable chaparral within Newell Creek Road, Glen Arbor Road, and Graham Hill Road North sections that may provide habitat for this species. The CNDDB lists 19 occurrences, modern and historic, within the vicinity of Santa Cruz.

San Francisco popcornflower (*Plagiobothrys diffusus*) is an annual herb that is state endangered with a CRPR of 1B.1. It occurs in coastal prairie and valley and foothill grasslands. The BSA supports grassland within the San Lorenzo Way and Graham Hill Road South sections, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP that may provide suitable habitat for this species. The CNDDB lists 19 occurrences, modern and historic, within the vicinity of Santa Cruz.

Special-Status Wildlife Species

Special-status wildlife are fish or wildlife species listed, or candidates for listing, as threatened or endangered by the USFWS and CDFW, designated as SSC by CDFW, designated as fully protected under the California Fish and Game Code, or that meet the definition of rare, threatened, or endangered as described in the CEQA Guidelines. Per Appendix G of the CEQA Guidelines, special-status wildlife species are those that have been observed or have the potential to occur based on documented occurrences in the region, life history and general habitat requirements, and overall suitability of the habitat within the project area to support such

species. USFWS-designated critical habitat for three listed wildlife species overlaps with the BSA: marbled murrelet (*Brachyramphus marmoratus*), Central California Coast steelhead (steelhead) (*O. mykiss irideus*), and Zayante band-winged grasshopper (*Trimerotropis infantilis*).

Based on the results of the literature review and database searches, 41 special-status wildlife species were identified as potentially occurring in the region surrounding the BSA. Of these, 21 species are not expected to occur due to the absence of suitable habitat or because the BSA is outside the known range of the species, and 7 species are considered to have low potential to occur based on the lack or low number of nearby occurrences and presence of low-quality habitat. These species were excluded from further analysis and are not discussed further; additional rationale is provided in Appendix G to Appendix B.

A total of six species were determined to have a moderate potential to occur in the BSA based on known occurrences and/or the presence of suitable habitat: pallid bat (*Antrozous pallidus*), steelhead, Townsend's big-eared bat (*Corynorhinus townsendii*), western pond turtle (*Emys* [=*Actinemys*] *marmorata*), western red bat (*Lasiurus blossevillii*), and Zayante band-winged grasshopper. The remaining seven species were determined to have a high potential to occur in the BSA and are summarized in Table 4.3-3 and further described below.

Table 4.3-3. Special-Status Wildlife Species with a High Potential to Occur Within the Biological Study Area

Scientific Name	Common Name	Federal/State	Potential to Occur*
Invertebrates			
Polyphylla barbata	Mount Hermon June beetle	FE/None	High
Amphibians			
Aneides flavipunctatus niger	Santa Cruz black salamander	None/SSC	High
Dicamptodon ensatus	California giant salamander	None/SSC	High
Birds			
Contopus cooperi	olive-sided flycatcher	None/SSC	High
Elanus leucurus	white-tailed kite	None/FP	High
Mammals			
Dipodomys venustus	Santa Cruz kangaroo rat	None/SS (S1)	High
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None/SSC	High

Source: CDFW 2021b.

Status Legend

* Although the BSA provides potential habitat, the proposed work areas do not generally support suitable habitat for these species due to the disturbed and developed nature of the ROW.

Federal

FE: federally endangered

State

SSC: California species of special concern

FP: fully protected species

SS: Listed Special Animals List

(S1): Critically Imperiled. At very high risk of extirpation in the state due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

Invertebrates

Mount Hermon June beetle is a federally endangered species that occurs primarily on Zayante sand soil in central Santa Cruz County; the species has also been observed on sandy loam and loamy sand soils adjacent to Zayante soils. It occurs in all Sandhills habitat of varying successional stages, including ponderosa pine forest, silverleaf manzanita chaparral and other chaparral, and coast live oak woodlands, as well as other woodlands and forests, and sand parkland (McGraw and Jordan 2021 as cited in Dudek 2021). It has also been observed in areas where native Sandhills habitat plant species have been removed, including those that are disturbed through development and that feature primarily ornamental or other non-native plant species (Arnold 2004 as cited in Dudek 2021).

Mount Hermon June beetle has high potential to occur in the BSA. There are two CNDDB occurrences that overlap the BSA along the Graham Hill Road North and Graham Hill Road South alignments (CDFW 2021c). Additionally, highly suitable Sandhills habitat occurs within the Newell Creek Road and Glen Arbor Road sections, as well as the Pipeline Road section of the existing NCP, within the BSA as described further in Section 4.3.1,4, Sensitive Vegetation Communities and Habitat Areas. Overall, Mount Hermon June beetle is likely to occur in portions of the BSA that support Zayante sand soil, including areas of transitional soils, and adjacent sandy loam soils. Within these soil types, the species can occur in all plant communities and other land cover types, including developed and disturbed areas, as well as paved areas.

Amphibians

The **Santa Cruz black salamander** (*Aneides flavipunctatus niger*) is restricted to mesic deciduous or coniferous forests in the fog belt of the outer Coast Range of San Mateo, Santa Cruz, and Santa Clara counties. It occurs in moist streamside microhabitats and is typically found under rocks near streams, in talus, and under damp woody debris. Santa Cruz black salamander has high potential to occur in the BSA. Streams (e.g., Newell Creek and Zayante Creek), and adjacent drainages provide suitable habitat and there are documented historical occurrences of this species in the vicinity of Ben Lomond southwest of the BSA (from the 1930s and 1960s) and a more recent record (from 2012) from Henry Cowell Redwoods State Park farther south (CDFW 2021c as cited in Dudek 2021).

The **California giant salamander** occurs in wet coastal forests near streams and seeps. This species' range is limited to Mendocino County, south to Monterey County and east to Napa County. Aquatic larvae are found in cold, clear streams and occasionally occur in lakes and ponds. Adults occur in wet forests under rocks and woody debris in the vicinity of streams or lakes. California giant salamander has high potential to occur in the BSA. Streams, drainages, and seeps in nearby uplands provide suitable habitat. Larvae near the existing Newell Creek Dam outlet north of the Proposed Project were observed in September 2018 during surveys for the Newell Creek Dam Inlet/Outlet Improvement Project. There are also two historic CNDDB occurrences in the vicinity: a 1930 museum specimen collected 0.25 mile west of the Newell Creek Road section (Occ. No. 132) and a 1972 observation in a roadside culvert 0.4 mile west of the Pipeline Road section of the existing NCP.

Birds

Olive-sided flycatcher (*Contopus cooperi*) is a summer resident and migrant in California from mid-April to October; the breeding season extends from early May to late August. It occurs in coniferous forests with open

canopies from near sea level to 9,400 feet throughout the state, where it is mostly associated with edges, openings, and natural and human-created clearings in otherwise dense forest. Open-cup nests are placed on the upper surface of a tree branch, typically 30 to 50 feet aboveground (Shuford and Gardali 2008 as cited in Dudek 2021). This species has high potential to occur in the BSA from May to August. There are several eBird (2021) observations in the BSA vicinity during this period (including several along the Newell Creek Road and Graham Hill Road North sections) and suitable habitat is present in most forest vegetation communities throughout the BSA. There are no CNDDB occurrences within or near the BSA but this species is poorly represented in the CNDDB because of its non-listed status and relatively recent addition to CDFW's SSC list.

White-tailed kite (*Elanus leucurus*) is a fully protected raptor species that occurs throughout California, primarily west of the Sierra Nevada in lowlands and foothills. Although white-tailed kites typically occur in open habitats such as grassland, marsh, and savanna, they will also use marginal habitats such as freeway edges and medians when foraging for voles and mice. Nests are constructed in a variety of trees, with coast live oak perhaps the most common, and placed high in the crown on thin branches (Peeters and Peeters 2005 as cited in Dudek 2021). White-tailed kite has high potential to nest but low potential to forage in the BSA. The forest and woodland vegetation communities provide suitable nest trees but the extent of open grassland or meadows for foraging is limited. The nearest CNDDB occurrence is a 2004 nest on the University of California, Santa Cruz (UCSC) Reserve approximately 1.5 miles west of the Graham Hill Road South section and there are two nesting season eBird (2021) observations in the BSA near Graham Hill Road and Mt. Hermon Road (Felton Pump Station section).

Mammals

Santa Cruz kangaroo rat is a subspecies of narrow-faced woodrat endemic to the Santa Cruz Mountains. It is currently only known to inhabit two areas: Mount Hermon atop Graham Hill Road in central Santa Cruz County and chaparral within the Sierra Azul Open Space Preserve in the Summit Area of the Santa Cruz Mountains. Within the Sandhills habitat, Santa Cruz kangaroo rat is known primarily from silverleaf manzanita chaparral, though the species may also occur in adjacent areas of ponderosa pine forest that feature a significant shrub component.

Santa Cruz kangaroo rat has high potential to occur in the BSA. The Graham Hill Road North section overlaps the known Mount Hermon occurrence, where it has been trapped within Henry Cowell State Park on the south side of the road and in the County of Santa Cruz Juvenile Hall Parcel on the north side of the Road (Bean 2004 as cited in Dudek 2021, McGraw 2021a). The Newell Creek Road and Glen Arbor Road sections of the BSA also feature silverleaf manzanita chaparral habitat that is highly suitable for the species. Patches of Sandhills chaparral traversed by the Pipeline Road section have moderate suitability for the species. Individual Santa Cruz kangaroo rats could disperse through the Proposed Project, including the road and road ROW; habitat adjacent to the road may also support suitable burrows for this species.

The **San Francisco dusky-footed woodrat** (*Neotoma fuscipes annectens*) is a subspecies of dusky-footed woodrat that occurs in forest habitats with moderate canopy and dense to moderate understories, particularly on the upper banks of riparian forests or within poison oak-dominated shrublands. It builds middens made of sticks, typically at the base of trees and shrubs, but sometimes in the low to mid-level canopy of a tree. This species requires ample midden building materials to construct middens of shredded grass, leaves, or other materials. Woodrat middens were observed within the Brackney South, Felton Pump Station and San Lorenzo Way sections of BSA during January 2021 field surveys.

Listed Species with Low or Moderate Potential to Occur

The federally endangered Zayante band-winged grasshopper is known to occur in the Sandhills habitat but has moderate potential to occur in the BSA. Areas along the Newell Creek Road and Graham Hill Road North sections feature open areas of silverleaf manzanita chaparral that are moderately suitable, the Glen Arbor Road section supports low-quality habitat, and the species is not expected to occur along the Graham Hill Road South section. The small patch of Sandhills habitat along Pipeline Road has low suitability for the species. Zayante band-winged grasshopper has limited potential to occur in road turn outs on Zayante soil adjacent to suitable habitat in the proposed work area; these areas feature loose sand soil and open canopies as well as sparse, primarily herbaceous vegetation that are suitable for this species.

Two listed anadromous fish species, coho salmon (*Oncorhynchus kisutch*) (Central California Coast Evolutionarily Significant Unit [ESU]) and steelhead (Central California Coast Distinct Population Segment [DPS]) are known to occur in the San Lorenzo River watershed but have low or moderate potential to occur in the BSA. Coho salmon is federally and state-listed as endangered and steelhead is federally listed as threatened. Suitable coho salmon spawning and rearing habitat is present in the San Lorenzo River and its tributaries but very few coho have been observed in the watershed since the late 1980s. Coho salmon therefore has low potential to occur in the BSA. Steelhead are known to occur in the lower reaches of Newell Creek and Zayante Creek and are considered to have a moderate potential to occur in the BSA.

The federally threatened California red-legged frog (*Rana draytonii*) is known to occur in the region (Santa Cruz Mountains) but has low potential to occur in the BSA. Newell Creek and other streams in the BSA are suitable for foraging and movement but the lack of deep plunge pools or other areas of still or slow-moving water and the presence of non-native predatory fish preclude breeding (Dudek 2018). Most aquatic features in the BSA are narrow, steep ephemeral drainages that do not pond water or support emergent vegetation. There are several CNDDB occurrences within 1 to 4 miles of the BSA, with the closest approximately 1 mile west of the San Lorenzo Lumber Yard section in Bull Creek, where an adult was seen in 2004.

The federally and state-endangered marbled murrelet (*Brachyramphus marmoratus*) is known to occur in the region in old-growth redwood forest but has very low potential to occur in the BSA at Henry Cowell Redwoods State Park. Most forest in this area is second-growth, having been extensively logged since the late 19th century (although timber harvesting on City-owned lands ceased about 20 years ago), and is therefore unsuitable for nesting murrelets. The closest CNDDB occurrence is a 2001 observation of "[two] birds circling below the [forest] canopy" in the Fall Creek sub-watershed of Henry Cowell Redwoods State Park, approximately 2 miles west of the Glen Arbor Road section. This area also represents the southernmost marbled murrelet breeding location in the Santa Cruz Mountains and the "only occupied murrelet site in the San Lorenzo River watershed" (Singer 2017 as cited in Dudek 2021). Dudek biologists also observed a single murrelet flying approximately 0.2 miles northwest of the Newell Creek Road section of the BSA during surveys for the Newell Creek Dam project in 2018 (Dudek 2018), presumably toward higher-quality habitat to the northwest.

4.3.1.4 Sensitive Vegetation Communities and Habitat Areas

Sensitive habitats and natural vegetation communities include riparian corridors, wetlands, habitats for state and/or federally protected species and other special-status species, areas of high biological diversity, areas providing important wildlife habitat, and/or unusual or regionally-restricted habitat types.

Sensitive Habitat Designations

For the purposes of this EIR, *sensitive vegetation communities* include the following: (1) those designated as sensitive by CDFW (2019a) (CDFW sensitive natural communities), which includes riparian vegetation communities; and (2) those designated as sensitive habitats by the County of Santa Cruz within Chapter 5 of the General Plan and County Code Title 16, some of which overlap with the CDFW designations. Each of these are briefly discussed below.

CDFW Sensitive Natural Communities

CDFW sensitive natural communities are 'natural communities' (of vegetation) or 'vegetation types' that have been evaluated by CDFW, using NatureServe's Heritage Methodology (Faber-Langendon et al. 2012) and vegetation community classifications from *A Manual of California Vegetation* (MCV) (Sawyer et al. 2009), and are ranked by rarity and threat. Evaluation is done at both the global (i.e., full natural range within and outside of California), and State (i.e., within California) levels resulting in a single 'G' (global) and 'S' (state) rank ranging from 1 (i.e., very rare and threatened) to 5 (i.e., demonstrably secure). The five levels of S-ranks are defined as follows:

- **S1 = Critically Imperiled**. Critically imperiled in California because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation.
- **S2 = Imperiled**. Imperiled in California because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.
- **S3 = Vulnerable.** Vulnerable in California due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- **S4 = Apparently Secure.** Uncommon but not rare in California; some cause for long-term concern due to declines or other factors.
- **S5 = Secure.** Common, widespread, and abundant in the state.

Additional threat ranks are defined as follows:

- 0.1 = Very threatened
- 0.2 = Threatened
- 0.3 = No current threat known

Natural communities with an S rank of S1, S2, or S3 are considered "sensitive" by CDFW and typically addressed in the CEQA environmental review process.

A total of 13 sensitive natural communities were identified as occurring within the BSA; Table 4.3-4 summarizes the sensitive natural communities (alliances) that were identified as occurring in the BSA based on the field mapping conducted for the Project. These sensitive communities generally align with sensitive riparian and sandhills habitats as further described below, except for Douglas fir-tanoak and redwood forest and woodland communities, which are not either. Figures 4.3-1A and 4.3-1B show locations of sensitive vegetation communities and habitats.

Riparian. Riparian vegetation communities occur along streams, ponds, rivers, and lakes and are considered sensitive because of their high habitat value for native wildlife. Riparian vegetation communities within the BSA included those mapped as bigleaf maple forest and woodland, black cottonwood forest and woodland, box-elder forest and woodland, California bay forest and woodland, California sycamore forest and woodland, and white alder groves (northern end of the Newell Creek Road section). However, smaller, unmapped stands may also occur wherever water is available. Sensitive riparian vegetation communities and habitats occur in the BSA within the Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, San Lorenzo Way, Felton Pump Station, and Graham Hill Road North sections.

Table 4.3-4. Sensitive Vegetation Communities within the Biological Study Area

Vegetation Alliance (Common Name)	CDFW CA Code	State Rarity	BSA (acres)
Forest and Woodland Alliances and Stands			
Bigleaf maple forest and woodland*	61.450.00	S3	2.7
Black cottonwood forest and woodland*	61.120.00	S3	1.8
Box-elder forest and woodland*	61.440.00	S2	2.4
California bay forest and woodland*	74.100.00	S3	20.9
California sycamore woodland*	61.310.00	S3	12.0
Douglas fir - tanoak forest and woodland	82.500.00	S3	4.5
Redwood forest and woodland	86.100.00	S3	186.4
Shrubland Alliances and Stands			
Coastal brambles	63.901.00	S3	0.4
Silverleaf manzanita chaparral	37.320.00	S1	44.0
Total			**275.1**

Note:
* indicates riparian vegetation community
State Rarity: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable (CDFW 2020)

County of Santa Cruz Sensitive Habitats

Two additional sensitive habitat types as mapped by Santa Cruz County and protected under County Code 16.32 occur within the BSA: Special Forests and Sandhills Habitat. Both habitat types were defined in the County General Plan adopted May 24, 1994. Special Forests and Sandhills Habitat within the BSA are depicted in Figures 4.3-1a and 4.3-1b for the northern and southern segments, respectively.

Special Forests

Special Forests are forests that are (1) unique natural communities, (2) limited in supply and distribution, (3) threatened by substantial disturbance from human activities, and (4) habitat for rare, endangered and/or locally unique species of plants and animals. Examples of Special Forests include San Andreas oak woodlands, woodland/maritime chaparral, indigenous Ponderosa pine, and indigenous Monterey pine forests. Within the BSA, the County has identified Special Forest within the Glen Arbor Road section and forest lands within Henry Cowell Redwoods State Park along Graham Hill Road. Approximately 2.7 acres of the Glen Arbor Road section and 82.5 acres of the Graham Hill Road North section have been mapped as Special Forest.

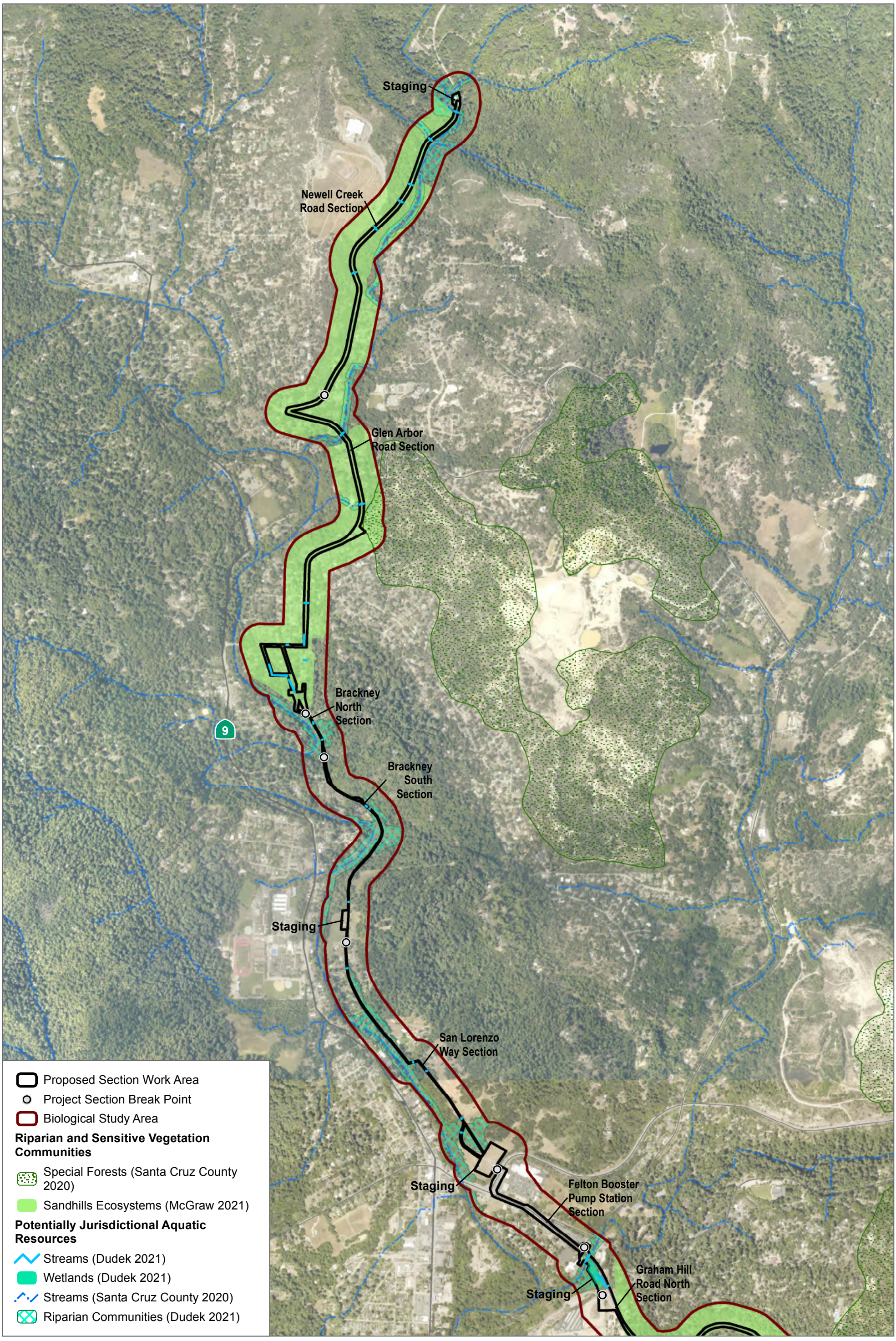
Sandhills Habitat

The Santa Cruz Sandhills is a unique, endemic habitat type that only occurs on outcrops of the Zayante sands soil type in central Santa Cruz County and is known to support several special-status plant and wildlife species, including state- and federally-listed species. Sandhills habitat occurs in the Scotts Valley, San Lorenzo Valley, and Bonny Doon areas. In these locations, Zayante sands soils provide habitat for several special-status species endemic to (i.e., found only in) this area, such as the Mount Hermon June beetle, the Zayante band-winged grasshopper, the Santa Cruz kangaroo rat (*D. venestus*), Scotts Valley spineflower, Santa Cruz wallflower, and silver-leaved manzanita. Like the Special Forest designation, the County maintains a map of Sandhills Habitat. This dataset was reviewed and refined as appropriate during the Sandhills habitat assessment. Results of the habitat assessment revealed that approximately 416 acres of Sandhills habitat occurs within the proposed Newell Creek Road, Glen Arbor Road, and Graham Hill Road North sections, as well as a small portion of the Graham Hill Road South section at the City's GHWTP, and the Pipeline Road section of the existing NCP in the BSA.

4.3.1.5 Jurisdictional Aquatic Resources

Potentially jurisdictional aquatic resources, including federal and state jurisdictional wetlands and non-wetland waters, occur throughout the BSA. Federal and state jurisdictional aquatic resources are regulated under the CWA, CFGC, Porter-Cologne Water Quality Act, and the California Coastal Act (see Section 4.3.2, Regulatory Setting, for additional information about the related laws and regulations). For the purposes of this assessment, the following riparian vegetation communities potentially support jurisdictional wetlands and waters under federal and state regulations:

- Black cottonwood forest and woodland
- Bigleaf maple forest and woodland
- Box-elder forest and woodland
- California bay forest and woodland
- California sycamore woodland
- White alder groves



SOURCE: Bing 2021: County of Santa Cruz 2021

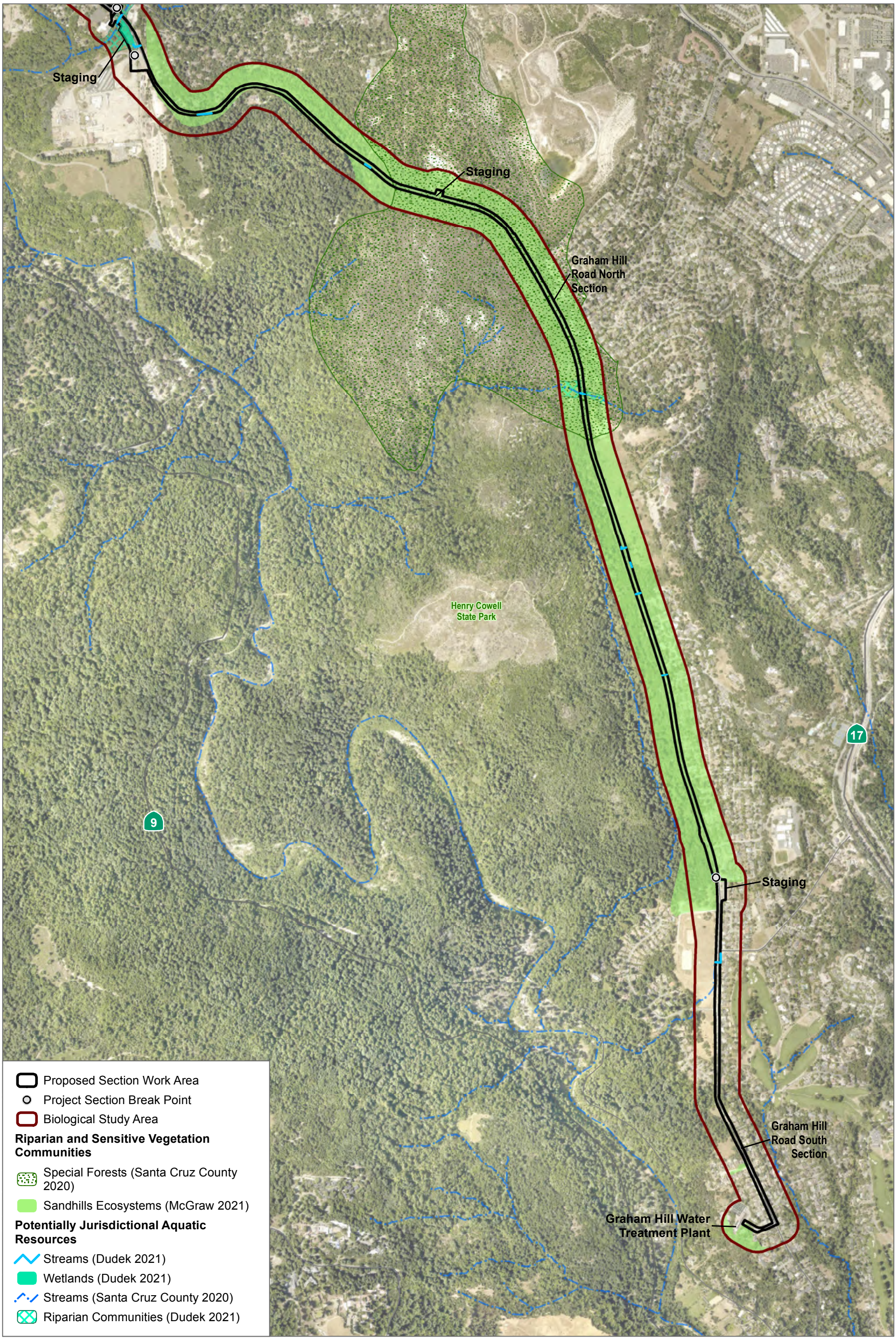
DUDEK

0 650 1,300 Feet

FIGURE 4.3-1A

Sensitive Habitat Areas - Northern Segment

Newell Creek Pipeline Improvement Project



SOURCE: Bing 2021; County of Santa Cruz 2021

DUDEK

0 650 1,300 Feet

FIGURE 4.3-1B

Sensitive Habitat Areas - Southern Segment

Newell Creek Pipeline Improvement Project

Potentially jurisdictional aquatic resources identified in the field included perennial and intermittent streams, ephemeral drainages, and wetlands. There were approximately 86 non-wetland waters and one wetland identified within the BSA. The majority of the non-wetland waters are ephemeral drainages and include ditches, culverts, and swales. There are six major, named streams and creeks within the BSA: San Lorenzo River, Newell Creek, Zayante Creek, Bean Creek, Eagle Creek, and Powder Mill Creek. Other unnamed, intermittent drainages also occur within the BSA based on mapping compiled by the County within the Streams dataset (Santa Cruz County 2020 as cited in Dudek 2021). All of the named creeks within the BSA are tributaries to the San Lorenzo River. The San Lorenzo River is a perennial drainage that originates in the Santa Cruz mountains, flows through the City of Santa Cruz, and ultimately drains into the Pacific Ocean. Figure 4 in Appendix B illustrates the location and extent of potentially jurisdictional aquatic resources within the BSA.

4.3.1.6 Wildlife Corridors/Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by assuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals and may also serve as primary habitat for smaller animals, such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as steppingstones for dispersal.

The BSA has value as a potential habitat linkage between areas of adjacent forest habitats. Regionally significant drainages such as Newell Creek, Zayante Creek, and San Lorenzo River flow through and along the BSA. These creek corridors are likely used by common and special-status wildlife species as cover and foraging habitat and to move between adjacent similar habitats. However, the BSA does not overlap with any large landscape blocks or critical linkages (mapped by Penrod et al. (2013) as cited in Dudek 2021).

4.3.2 Regulatory Framework

4.3.2.1 Federal

Clean Water Act

The Federal Water Pollution Control Act of 1972 (Clean Water Act) (33 USC 1251 et seq.), as amended by the Water Quality Act of 1987 (PL 100-4), is the major federal legislation governing water quality. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The definition of what constitutes "waters of the United States" (provided in 33 CFR Section 328.3(a)) has changed multiple times over the past 36 years starting with the United States v. Riverside Bayview Homes, Inc. court ruling in 1985. Subsequent court proceedings, rule makings, and congressional acts in 2001 (Solid Waste Agency of North Cook County v. United States Army Corps of Engineers), 2006 (Rapanos v. United States), 2015 (Waters of the United States [WOTUS] Rule), 2018 (suspension of the WOTUS Rule), and 2019 (formal repeal of the WOTUS Rule) have attempted to provide greater clarity to the term and its regulatory

implementation. The most recent Navigable Waters Protection Rule (NWPR), issued by the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) in January 2020, defined "waters of the United States" to include the following four categories: (1) the territorial seas and traditional navigable waters; (2) tributaries of such waters; (3) certain lakes, ponds, and impoundments of jurisdictional waters; and (4) wetlands adjacent to other jurisdictional waters (other than waters that are themselves wetlands). However, this rule was remanded and vacated with the August 2021 decision in Pasqua Tribe et al v United States Environmental Protection Agency. As a result, the current administration is evaluating a new rulemaking process. In the meantime, the EPA and USACE have halted implementation of the NWPR nationwide and will revert to and apply the CWA 1986 definition and the 2008 Rapanos guidance, informally referred to as "the pre-2015 regulatory regime", until further notice. The term "wetlands" (a subset of waters) is defined in 33 CFR Section 328.3(b) as "those areas that are inundated or saturated by surface or ground water 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." Discharges into waters of the United States and wetlands are regulated under Section 404 by the USACE.

In California, the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) are responsible for implementing the Clean Water Act and related elements of the California Water Code (see Section 2.2.4 Porter-Cologne Water Quality Act).

Important applicable sections of the Clean Water Act are as follows:

- Section 401 requires an applicant for any federal permit for an activity that may result in a discharge of pollutants into waters of the United States to obtain certification from the state that the activity complies with all applicable water quality standards, limitations, and restrictions. Section 401 water quality certification is provided by the RWQCB and typically include conditions to minimize impacts on water quality.
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for municipal and industrial discharges of any pollutant (except for dredge or fill material) into waters of the United States. The National Pollutant Discharge Elimination System program establishes limits on allowable concentrations and mass emissions of pollutants contained in point source and non-point source discharges. This program is administered by the RWQCB. Conformance with Section 402 is typically addressed in conjunction with water quality certification under Section 401.
- Section 404 provides for issuance of permits for the discharge of dredge or fill material into waters of the United States, including wetlands, by USACE. Two types of permits are issued by the USACE under Section 404: General Permits and Individual Permits. General Permits, which authorize groups activities with minimal impacts to an aquatic environment, can include Nationwide Permits, Regional General Permits, and Programmatic General Permits. Individual Permits are issued for projects that could cause significant impacts to an aquatic environment and require a lengthier public review process.

Federal Endangered Species Act

The FESA of 1973 (16 U.S.C. 1531 et seq.), as amended, is administered by the USFWS for most plant and animal species and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service

for certain marine species. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide programs for the conservation of those species, thus preventing the extinction of plants and wildlife. Federal ESA defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under federal ESA, it is unlawful to take any listed species; "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." As part of this regulatory act, federal ESA provides for designation of critical habitat, defined in federal ESA Section 3(5)(A) as specific areas within the geographical range occupied by a species where physical or biological features "essential to the conservation of the species" are found and that "may require special management considerations or protection." Critical habitat may also include areas outside the current geographical area occupied by the species that are nonetheless "essential for the conservation of the species." Critical habitat designations identify, with the best available knowledge, those biological and physical features (primary constituent elements) which provide for the life history processes essential to the conservation of the species.

FESA allows for the issuance of incidental take permits for listed species under Section 7, which is generally available for projects that also require other federal agency permits or other approvals, and under Section 10, which provides for the approval of habitat conservation plans (HCPs) on public or private property without any other federal agency involvement. The Proposed Project would overlap with the permit areas for three HCPs approved by the USFWS, two of which were co-developed by the City; these HCPs are described below.

Interim-Programmatic Habitat Conservation Plan for Mount Hermon June Beetle and Ben Lomond Spineflower

In June 2011, the USFWS, County of Santa Cruz, and City of Scotts Valley developed the *Interim-Programmatic Habitat Conservation Plan for the Endangered Mount Hermon June beetle and Ben Lomond Spineflower* (IPHCP) to cover eligible small development projects in densely developed residential neighborhoods that support habitat for the federally endangered Mount Hermon June beetle (*Polyphylla barbata*) and Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*). This IPHCP is intended to support issuance of two incidental take permits (ITPs) under section 10(a)(1)(B) of FESA that would authorize the County and the City of Scotts Valley to take Mount Hermon June beetle resulting from such activities. The County and the City of Scotts Valley would then extend their take coverage through Certificates of Inclusion to eligible landowners within their jurisdiction needing incidental take authorization associated with their small development projects.

The 10 Project Units within the IPHCP boundary were identified within the communities of Ben Lomond, Felton, Mount Hermon, and Scotts Valley. These Project Units range in size from 3.2 to 373 acres. Project Units include parcels in the vicinity of the Rolling Woods neighborhood, the Whispering Pines neighborhood, east and west Scotts Valley, Green Valley, Mount Hermon, Zayante Road, and Ben Lomond. The existing NCP abuts the Mount Hermon IPHCP Project Unit at the northern end of the Graham Hill Road North section and the Rolling Woods Project Unit at the southern end of the Graham Hill Road North section and northern end of the Graham Hill Road South section.

City of Santa Cruz Operations and Maintenance Habitat Conservation Plan

The City developed the Operations and Maintenance Habitat Conservation Plan (O&M HCP) for improvements or projects with the potential to take federally listed species and other non-listed special-status species. The USFWS approved and has issued an Incidental Take Permit (No. TE89655D-0) for the O&M HCP, which covers six wildlife and four plant species: Ohlone tiger beetle (*Cicindela ohlone*; federally endangered), Mount Hermon June beetle, tidewater goby (*Eucyclogobius newberryi*; federally endangered), Pacific lamprey (*Entosphenus tridentatus*; California Species of Special Concern), California red-legged frog (*Rana draytonii*; federally threatened), western pond turtle (*Emys marmorata*; California Species of Special Concern), robust spineflower (*Chorizanthe robusta* var. *robusta*; federally endangered), Santa Cruz tarplant (*Holocarpha macradenia*; federally threatened and state endangered), San Francisco popcorn flower (*Plagiobothrys diffusus*; state endangered), and Ben Lomond spineflower. The biological goals and objectives and conservation measures include restoring habitat temporarily disturbed, contributing to protected and managed lands that support covered populations, implementing bypass flows consistent with the Anadromous Salmonid HCP (currently being developed), pursuing other conservation actions that will result in conservation benefits, and implementing general and species-specific impact minimization measures and best management practices. The O&M HCP addresses upgrades to the North Coast Pipeline and rehabilitation of diversion structures, operation of existing City facilities, and operations and maintenance of existing water diversions and transmission lines and their associated features. The O&M HCP was recently finalized and the incidental take permit was issued by the USFWS in January 2021; the permit is effective through January 2051 (City of Santa Cruz 2021).

Graham Hill Water Treatment Plant (GHWTP) Low-Effect Habitat Conservation Plan

The City developed a low-effect HCP for the operations, maintenance, and construction activities associated with the GHWTP (GHWTP LEHCP; City of Santa Cruz 2013). The USFWS approved and has issued an Incidental Take Permit (No. TE15139B-0) for this low-effect HCP, which covers incidental take of Mount Hermon June beetle, Zayante band-winged grasshopper, and Ben Lomond spineflower as a result of all current and future operations, maintenance, and construction activities at the GHWTP. The HCP covers the entire 12.71 acres of the GHWTP property, and includes 5.7 acres of suitable habitat, and 0.88 acres of occupied habitat for these species. The conservation strategy emphasizes protection of habitat through impact avoidance and implementation of measures designed to minimize impacts to Mount Hermon June beetle. To mitigate for unavoidable impacts to Mount Hermon June beetle, the City has protected suitable and occupied sandhills habitat at its 17-acre Bonny Doon mitigation site and can purchase credits from the USFWS-approved Zayante Sandhills Conservation Bank. There are 11.3 acres remaining at the mitigation site to compensate for future impacts to Mount Hermon June Beetle and potentially other species which rely on sandhills habitat.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) was originally passed in 1918 as four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The primary motivation for the international negotiations was to stop the “indiscriminate slaughter” of migratory birds by market hunters and others. The MBTA protects over 800 species of birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BAGEPA) is the primary law protecting both bald and golden eagles. Specifically, BAGEPA prohibits "take" of eagles without a permit and defines take to include "pursue, destroy, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" and prohibits take of individuals, active nests, or eggs. The term "disturb" is further defined by regulation as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, injury to an eagle, a decrease in productivity, or nest abandonment" (50 CFR 22.3).

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. Sections 1801–1884) of 1976, as amended in 1996 and reauthorized in 2007, is intended to protect fisheries resources and fishing activities within 200 miles of shore. The amended law, also known as the Sustainable Fisheries Act (Public Law 104-297), requires all federal agencies to consult with the Secretary of Commerce on proposed projects authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The main purpose of the EFH provisions is to avoid loss of fisheries due to disturbance and degradation of the fisheries habitat.

4.3.2.2 State

California Environmental Quality Act

CEQA requires identification of a project's potentially significant impacts on biological resources and ways that such impacts can be avoided, minimized, or mitigated. The act also provides guidelines and thresholds for use by lead agencies for evaluating the significance of project impacts.

CEQA Guidelines Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" (14 California Code of Regulations [CCR] 15380(b)(1). A rare animal or plant is defined in Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened under CEQA if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c).

CDFW has developed a list of "Special Species" as "a general term that refers to all of the taxa the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status." This is a broader list than those species that are protected under FESA, the CESA, and other CFGC provisions, and includes lists developed by other organizations, such as the Audubon Watch List Species. Guidance documents prepared by other agencies, including the Bureau of Land Management Sensitive Species and USFWS Birds of Special Concern, are also included on this CDFW Special Species list. Additionally, CDFW has concluded that plant species included on the CNPS's California Rare Plant Rank (CRPR) List 1 and 2 are covered by CEQA Guidelines Section 15380.

CEQA Guidelines Section IV, Appendix G (Environmental Checklist Form), requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service" (14 CCR 15000 et seq.).

CEQA Guidelines Section 15065, subdivision (a) (as reflected in the portion of the CEQA Guidelines Appendix G Environmental Checklist form devoted to Mandatory Findings of Significance), requires lead agencies to find significant environmental effects where a proposed project would 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; or substantially reduce the number or restrict the range of an endangered, rare or threatened species.

California Endangered Species Act

CESA (CFGC Section 2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Under CESA, take is prohibited for both listed and candidate species, but take is more narrowly defined than it is under FESA as it does not include "harm and harass", which includes significant habitat modification or degradation, as included in the FESA definition. CESA prohibits the take (hunt, pursue, catch, capture, kill, or attempt to hunt, pursue, catch, capture, or kill) of listed species except as otherwise provided in state law. Unlike its federal counterpart, the CESA applies the take prohibitions to species petitioned for listing (state candidates). Take authorization may be obtained by project applicants from the CDFW under CESA Sections 2080.1 or 2081. Under Section 2080.1, the CDFW can issue a consistency determination that concludes the findings of a FESA biological opinion is consistent with state law. Alternatively, the CDFW can issue a Section 2081 incidental take permit, which allows take of a state listed species for educational, scientific, or management purposes or where the take is incidental to an otherwise lawful activity. In this case, project applicants consult with CDFW to develop a set of measures and standards for managing the listed species, including the minimization and full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

California Fish and Game Code

Fully Protected Species

The classification of "fully protected" was the state's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles and birds. Fully protected species may not be taken or possessed at any time, except through natural community conservation plans (see CDFG Code Section 2801 et seq.), and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the species for the protection of livestock.

Lake and Stream Resources

Under CFGC Section 1602, CDFW has authority to regulate work that will substantially divert or obstruct the natural flow of or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake. CDFW also has authority to regulate work that will deposit or dispose of debris, water, or other material

containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to any person, state, or local governmental agency or public utility (CFGC Section 1601). CDFW jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries (as defined by Clean Water Act Section 404) sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under CFGC Section 1602 may encompass a greater area than those regulated under Clean Water Act Section 404; CDFW does not have jurisdiction over ocean or shoreline resources.

Fish and Game Code Sections 3503, 3503.5, 3511, 3513, and 4150

CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. CFGC Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3511 states fully protected birds or parts thereof may not be taken or possessed at any time. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA. All nongame mammals, including bats, are protected by CFGC Section 4150.

California Native Plant Protection Act

The Native Plant Protection Act of 1977 directed CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The Native Plant Protection Act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. CESA expanded on the original Native Plant Protection Act and enhanced legal protection for plants, but the Native Plant Protection Act remains part of the CFGC. To align with federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the act as threatened species but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in CESA, appropriate compensatory mitigation measures for significant impacts to rare plants are typically negotiated with the CDFW.

Natural Community Conservation Planning Act of 1991

The Natural Community Conservation Planning (NCCP) Act is designed to conserve natural communities at the ecosystem scale while accommodating compatible land use. CDFW is the principal state agency implementing the NCCP program. Natural community conservation plans developed in accordance with the NCCP Act provide for comprehensive management and conservation of multiple wildlife species, and identify and provide for the regional or area-wide protection and perpetuation of natural wildlife diversity while allowing compatible and appropriate development and growth.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code Division 7, Section 13000 et seq.) established the SWRCB and RWQCBs as the principal state agencies responsible for the protection of water

quality in California. The Central Coast Regional Water Quality Control Board (CCRWQCB) has regulatory authority over portions of the biological study area. The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights." Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "…any surface water or groundwater, including saline waters, within the boundaries of the state." All dischargers are subject to regulation under the Porter-Cologne Water Quality Control Act, including both point and nonpoint source dischargers. The CCRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. On April 2, 2019, the SWRCB adopted by Resolution 2019-0015 the "State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State" ("Procedures") for inclusion in the Water Quality Control Plans for Inland Surface Waters, Enclosed Bays, and Estuaries of California. The Procedures became effective on May 28, 2020; however, the Procedures have been the subject of a legal judgement by the California Superior Court.[1]

In adopting the Procedures, the SWRCB noted that under the Porter-Cologne Water Quality Control Act discharges of dredged or fill material to waters of the state are subject to waste discharge requirements or waivers. The SWRCB further explained that "although the state has historically relied primarily on requirements in the Clean Water Act to protect wetlands, U.S. Supreme Court rulings reducing the jurisdiction of the Clean Water Act over wetland areas by limiting the definition of 'waters of the United States' have necessitated the use of California's independent authorities under the Porter-Cologne Act to protect these vital resources."

By adopting the Procedures, the SWRCB mandated and standardized the evaluation of impacts and protection of waters of the state from impacts due to dredge and fill activities. The Procedures include: (1) a wetland definition; (2) a jurisdictional framework for determining if a feature that meets the wetland definition is a water of the state; (3) wetland delineation procedures; and 4) procedures for application submittal, and the review and approval of dredge or fill activities.

The Procedures define an area as a wetland if it meets three criteria: wetland hydrology, wetland soils, and (if vegetated) wetland plants. An area is a wetland if: (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. This modified three-parameter definition is similar to the federal definition in that it identifies three wetland characteristics that determine the presence of a wetland: wetland hydrology, hydric soils, and hydrophytic vegetation. However, unlike the federal definition, the Procedures' wetland definition allows for the presence of hydric substrates as a criterion for wetland identification (not just wetland soils) and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland.

Waters of the State includes more aquatic features than Waters of the U.S. In addition, the federal definition of a wetland requires a prevalence of wetland vegetation under normal circumstances. To account for wetlands

[1] On January 26, 2021, the Superior Court in *San Joaquin Tributaries Authority v. California State Water Resources Control Board* issued a judgment and writ enjoining the SWRCB from applying, via the Water Quality Control Plan for Inland Surface Waters and Enclosed Bays [and Estuaries], the Procedures to waters other than those for which water quality standards are required by the Federal Clean Water Act. The SWRCB subsequently adopted another resolution on April 2, 2021 confirming that the Board's April 2, 2019 action relied, in part, on Water Code Section 13140, that allows the SWRCB to formulate and adopt state policy for water quality control and that the Procedures are therefore effective for all waters of the state as state policy for water quality control.

in arid portions of the state, the SWRCB's definition differs from the federal definition in that an area may be a wetland even if it does not support vegetation. If vegetation is present, however, the SWRCB's definition requires that the vegetation be wetland vegetation. The SWRCB's definition clarifies that vegetated and unvegetated wetlands will be regulated in the same manner.

The Procedures also include a jurisdictional framework that applies to aquatic features that meet the wetland definition. The jurisdictional framework will guide applicants and staff in determining whether an aquatic feature that meets the wetland definition will be regulated as a water of the state. The jurisdictional framework is intended to exclude from regulation any artificially-created, temporary features, such as tire ruts or other transient depressions caused by human activity, while still capturing small, naturally-occurring features, such as seasonal wetlands and small vernal pools that may be outside of federal jurisdiction. The Procedures do not expand the SWRCB's jurisdiction beyond areas already under SWRCB's jurisdiction.

California Government Code – Local Exemptions

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, and transmission of water supplies are exempt from local (i.e., county and city) building and zoning ordinances.

4.3.2.3 Local

The Proposed Project relates to operation, utilization, storage, and transmission of water supplies, and therefore, as indicated above, these facilities are legally exempt under California Government Code Section 53091 (d) and (e) from the County of Santa Cruz building and zoning ordinances. Where applicable and when feasible to meet project objectives, the Proposed Project would be constructed consistent with local policies and ordinances. This section describes local programs, policies, and regulations related to biological resources that may apply to the Proposed Project.

County of Santa Cruz General Plan, Local Coastal Program, and Ordinances

General Plan

The Santa Cruz County General Plan and Local Coastal Program (LCP) is a comprehensive, long-term planning document for the unincorporated areas of the County and includes the County's LCP, which was certified by the California Coastal Commission in 1994 (County of Santa Cruz, 1994). The County General Plan and LCP provides policies and programs to establish guidelines for future growth and all types of physical developments. The County is in the process of updating some of the General Plan/LCP elements as part of its Sustainability and Regulatory Update, which is expected to be considered by County decision-makers in 2022.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.2 (Riparian Corridors and Wetlands), establishes definitions for riparian corridors and wetlands to ensure their protection. Policies 5.2.1 through 5.2.5 identify and define riparian corridors and wetlands, determine the uses which are allowed in and adjacent to these habitats, and specify required buffer setbacks and performance standards for land in and adjacent to these areas. Riparian corridors are defined as (a) 50 feet from the top of a distinct channel or physical evidence of high water mark of perennial stream; (b) 30 feet from the top of a distinct channel or physical evidence of high water mark of an intermittent stream as

designated on the General Plan maps and through field inspection of undesignated intermittent and ephemeral streams; (c) 100 feet of the high water mark of a lake, wetland, estuary, lagoon, or natural body of standing water; (d) the landward limit of a riparian woodland plant community; and (e) wooded arroyos within urban areas. The County definitions are consistent with those used for CEQA purposes.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.1 (Biological Diversity), establishes definitions for sensitive habitats to ensure their protection. Policies 5.1.1 through 5.1.11 identify and define sensitive habitats, determine the uses which are allowed in and adjacent to these habitats, and specify performance standards for land in and adjacent to these areas.

Because the Proposed Project does not occur within the Coastal Zone, it would not require compliance with the LCP or the standards contained in the LCP implementing ordinances, nor would the Proposed Project require a Coastal Development Permit.

Santa Cruz County Code

While some of the below ordinances require separate approvals or permits (e.g., Riparian Exception), such approvals are not required for the Proposed Project, as it falls under California Government Code Section 53091 (d) and (e) and is legally exempt from Santa Cruz County building and zoning ordinances, as described above. The following implementing ordinances are described primarily for informational purposes, in addition to providing added context to the definition of sensitive resources for CEQA analysis.

Santa Cruz County Code Chapter 16.20, Grading Regulations, sets forth rules and regulations to control all grading, including excavations, earthwork, road construction, dredging, diking, fills, and embankments. Santa Cruz County Code Chapter 16.22 requires control of all existing and potential conditions of accelerated (human-induced) erosion, and sets forth required provisions for project planning, preparation of erosion control plans, runoff control, land clearing, and winter operations.

Santa Cruz County Code Chapter 16.30, Riparian Corridor and Wetlands Protection, includes regulations to limit development activities in riparian corridors. The regulations provide that "no project shall undergo developmental activities in riparian corridors or areas with urban or rural service lines which are within a buffer zone as measured from the top of the arroyo." Buffer areas are specified in the regulations and are determined from characteristics found in the riparian area, including average slope within 30 feet of water's edge, vegetation, and stream characteristics. The buffer always extends 50 feet from the edge of riparian woodland and 20 feet beyond the edge of other woody vegetation, as determined by the dripline. After the buffer is determined, a 10-foot setback from the edge of the buffer is required for all structures, which allows construction equipment and use of a yard area. Exceptions and conditioned exceptions to the provisions of this code may be authorized. Findings meeting the following criteria define the circumstances necessary in granting an exception to the above requirements:

1. That there are special circumstances or condition affecting the property.
2. That the exception is necessary for the proper design and function of some permitted or existing activity on the property.
3. That the granting of the exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located.

4. That the granting of the exception, in the Coastal Zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative.
5. That the granting of the exception is in accordance with the purpose of this chapter, and with the objectives of the General Plan and elements thereof, and the Local Coastal Program Land Use Plan.

Santa Cruz County Code Chapter 16.32 regulates development in or adjacent to specified environmentally sensitive habitat areas. An area defined as "sensitive habitat" under this ordinance includes various criteria, and includes all lakes, wetlands, estuaries, lagoons, streams, rivers, and riparian corridors. No development activity may occur within an area of biotic concern unless approval is issued or unless the activity is reviewed concurrently with the review of an associated development or land division application. All development within environmentally sensitive habitat must be mitigated or restored. The following findings are necessary in granting an exception to the provisions and requirements of this ordinance:

1. that adequate measures will be taken to ensure consistency with the purpose of this chapter to minimize the disturbance of sensitive habitats; and
2. one of the following situations exists:
    a. the exception is necessary for restoration of a sensitive habitat; or
    b. it can be demonstrated by biotic assessment, biotic report, or other technical information that the exception is necessary to protect public health, safety, or welfare.

Any development activity that has received a riparian exception according to the provisions of Santa Cruz County Code Chapter 16.30 would not be subject to this chapter.

City of Santa Cruz General Plan, Local Coastal Program, and Ordinances

General Plan 2030

Four habitat types found within the City of Santa Cruz are recognized as sensitive habitat types: freshwater wetland, salt marsh, riparian forest and scrub, and coastal prairie portions of grassland habitats. Except for freshwater wetland, these habitat types correspond to habitat types that the CNDDB has designated as "high priority." In addition, coastal bird habitat is considered sensitive habitat because of high biological diversity. Additionally, any area supporting a special status species would also be considered a sensitive habitat. The General Plan sets forth protocols for evaluation of sensitive habitat and sensitive species. For riparian areas, this includes compliance with the *City-Wide Creeks and Wetlands Management Plan.*

City-wide Creeks and Wetlands Management Plan

Activities within the City limits that occur along or adjacent to riparian areas are regulated by the *City-wide Creeks and Wetlands Management Plan* (Creeks Plan; City of Santa Cruz 2008). The Creeks Plan was adopted by the City Council to provide a comprehensive approach to managing all creeks and wetlands within the City. The Plan recommends specific setback requirements based on biological, hydrological, and land use characteristics for various watercourse types within the City. The recommended setbacks within a designated management area include a riparian corridor setback and a development setback area; an additional area extends from the outward edge of the development area to the outer edge of the management area. The Management Plan outlines a process for permitting development adjacent to watercourses. Projects that

require a Watercourse Development Permit would be subject to the provisions in Chapter 24.08, Part 21 of the City's Municipal Code (Zoning Regulations) that pertain to issuance of these permits. The Plan and zoning regulations include specified development standards and management guidelines. It should be noted that repair, maintenance, or minor alteration of existing public utilities or projects that are reviewed and approved under another authorizing permitting agency (USACE, RWQCB, and/or CDFW) are exempt from City permit requirements.

The only portion of the Proposed Project that occurs within the City limits is the GHWTP parcel located immediately adjacent and to the west of the terminus of the Graham Hill Road South section. The nearest drainage to this portion of the Proposed Project is the San Lorenzo River, which occurs approximately 1,000 feet to the west of the Proposed Project work area. The Creeks Plan does not identify any riparian corridors or setbacks associated with the San Lorenzo River within the BSA.

Municipal Code Regulations

Section 24.14.080 of the City's Municipal Code includes provisions to protect wildlife habitat and protected species for areas specified in the City's existing General Plan (Maps EQ-8 and EQ-9). Section 24.08.21 also regulates development adjacent to city watercourses, consistent with provisions of the adopted *City-Wide Creeks and Wetlands Management Plan*, including requirements for issuance of a "watercourse development permit."

Chapter 9.56 of the City Municipal Code defines heritage trees, establishes permit requirements for the removal of a heritage tree, and sets forth mitigation requirements as adopted by resolution by the City Council. Heritage trees are defined by size, historical significance, and/or horticultural significance, including but not limited to those which are: (1) unusually beautiful or distinctive; (2) old (determined by comparing the age of the tree or shrub in question with other trees or shrubs of its species within the city); (3) distinctive specimen in size or structure for its species (determined by comparing the tree or shrub to average trees and shrubs of its species within the city); (4) a rare or unusual species for the Santa Cruz area (to be determined by the number of similar trees of the same species within the city); or (5) providing a valuable habitat. Resolution NS-23,710, which was rescinded by Resolution No. NS-28-706 and then reinstated by Resolution No NS-29,092, establishes criteria and standards for the circumstances under which a heritage tree may be removed. City regulations require tree replacement for approved to include replanting three 15-gallon or one 24-inch size specimen or the current retail value which shall be determined by the Director of Parks and Recreation. Removal would be permitted if found to be in accordance with the criteria and requirements previously outlined.

4.3.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to biological resources. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.3.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to biological resources are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Result in a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

B. Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

C. Result in 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.

D. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

E. Result in conflicts with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance.

F. Result in conflicts with the provision of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Additionally, CEQA Guidelines Section 15065(a)(1) sets forth three mandatory findings of significance related to degradation of biological resources. Therefore, a significant impact to biological resources related to these mandatory findings would occur if the Proposed Project would:

G. Substantially reduce the habitat of a fish or wildlife species.

H. Cause a fish or wildlife population to drop below self-sustaining levels.

I. Threaten to eliminate a plant or animal community.

J. Substantially reduce the number or restrict the range of a rare or endangered plant or animal.

4.3.3.2 Analytical Methods

Potential impacts to biological resources in the study area were evaluated based on the results of the literature review and field surveys summarized in Section 4.3.1 (as explained in Appendix B) and the location of identified resources relative to the Proposed Project. Additional information on how impacts were analyzed for the construction and operational phases of the Proposed Project is provided below.

Construction

The impact analysis presented below focuses on temporary construction-related impacts of the Proposed Project. The pipeline generally would be installed within existing road pavement, road ROW, and/or existing City easements. When utilizing the existing alignment, the new pipeline would be installed parallel to the existing pipeline. The majority of the Proposed Project would be installed using conventional (open cut)

trenching methods. However, special trenchless (horizontal directional drilling and bore and jack) construction techniques would be utilized in the Brackney North section and at the railway crossing in the Graham Hill Road North section.

The northern segment of the Proposed Project has two creek crossings over Newell Creek and over one unnamed tributary. The southern segment of the Proposed Project has one creek crossing at Zayante Creek and two culverted creek crossings (Eagle Creek and Powder Mill Creek). Construction methods for the creek crossings include replacement of existing above-ground pipeline crossings on Newell Creek, installation of above-ground pipeline at the existing Zayante Creek crossing, and installation under or above culverted crossings at Eagle Creek and Powder Mill Creek, which would minimize potential impacts to special-status biological resources. For the two crossings over Newell Creek, the proposed pipeline would be installed on and/or adjacent to an existing bridge near the same location as the existing pipeline. The Proposed Project would be installed over Zayante Creek on existing concrete abutments that also support another City raw water pipe (Felton Diversion pipeline). Additional improvements consisting of two 30-inch drilled concrete piers would also be established at the south side of the existing abutment to provide additional structural support to the Zayante Creek crossing. While existing infrastructure and pipeline alignments will be utilized to the extent feasible, temporary impacts during construction may occur immediately adjacent to creek crossings. Construction activities are not planned in the creeks, and construction would avoid direct impacts to the active channel and surface water within drainages and creeks. Direct, permanent impacts resulting from construction of pipeline supports or foundations would be limited to previously disturbed areas within the existing ROW.

Upon completion of construction, work areas would be revegetated and/or restored, and disturbed roadways would be repaved in accordance with County requirements. Once the new NCP pipeline sections are completed and operational, the existing pipeline sections would be decommissioned. This would involve capping off the existing pipeline and injecting the pipeline with grout or removing sections of pipeline. With the decommissioning of existing NCP sections, existing fire hydrants along Pipeline Road in Henry Cowell Redwoods State Park also would be abandoned. All above-grade appurtenances along the abandoned pipeline would be completely removed.

Operations

The operations and maintenance activities following project construction would remain similar to existing operations and maintenance activities; operations would include continued implementation of pump start-up and valve operations at the FBPS, when needed to pump water to or from Loch Lomond Reservoir. Once installed, maintenance of the pipeline would include intermittent, periodic inspections and maintenance of air valves with access provided to the pipeline sections by existing roads and easements. The Brackney North pipeline section would have isolation and air valves on either end of the new pipeline and would not need to be accessed in the future unless removed for replacement (HDR 2020). Other periodic maintenance activities include inspection and maintenance of culverts and other drainage features. No new paved or unpaved areas would be created that would require maintenance.

Future operations and maintenance activities associated with the Proposed Project would be similar to those that currently exist with the existing NCP. However, it is expected that the portion of the pipeline relocated from Henry Cowell Redwoods State Park to Graham Hill Road would result in a potential reduction in pipe damages and need for repairs. The replacement of the aged pipeline infrastructure would require fewer inspections and less maintenance than under current conditions. Rerouting sections of the proposed pipeline to improve ease

of access for maintenance and repair would reduce the risk of equipment or infrastructure failure that could potentially impact biological resources in the vicinity of the pipeline (e.g., via leaks and subsequent erosion of slopes, washout of vegetation and access road construction to repair damaged pipelines).

Application of Relevant Standard Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts to biological resources. These practices and their effectiveness in avoiding and minimizing effects are described below.

Standard Construction Practices #1-5 requires implementation of erosion control best management practices. Standard Construction Practice #1 specifies measures to be implemented during construction, such as silt fences, fiber or straw rolls, and/or bales; covering of stockpiled spoils; revegetation and physical stabilization of disturbed areas; and sediment-control fencing, dams, barriers, berms, traps, and basins, for activities occurring in or adjacent to jurisdictional aquatic resources. Standard Construction Practice #2 requires stockpile containment and use of exposed soil stabilization structures. Standard Construction Practice #3 requires use of runoff control devices to be used during construction during the rainy season, and inspection of such devices following rain events. Standard Construction Practice #4 requires implementation of wind erosion (dust) controls. These practices would be effective at limiting the potential for fugitive dust generation and erosion. Standard Construction Practices #5-9 include measures to locate materials and equipment away from water bodies to prevent water quality degradation. Standard Construction Practices include general habitat protection measures to avoid disturbance to retained riparian vegetation (#13), restore disturbed natural communities (#14), and provide construction worker training about sensitive biological resources that may be present (#16).

Impact Evaluation Approach

Impacts have been evaluated with respect to the thresholds of significance described above. Both direct and indirect impacts are considered.

- **Direct impacts** refer to removal of a biological resource and may be permanent or temporary. *Direct permanent impacts* refer to the complete and permanent loss of a resource while *direct temporary impacts* refer to the short-term removal of a resource where the resource is expected to fully recover its function upon project completion. For purposes of this report, direct impacts, whether permanent or temporary, refer to the area where vegetation clearing, grubbing, or excavation removes biological resources. Direct impacts were estimated by overlaying the proposed project impact limits (i.e., work area) on the mapped biological resources within the BSA. Impact limits were determined based on available designs for project segments (Brackney North and Graham Hill Road North/South) and an assumed construction disturbance corridor for the remaining segments.
- **Indirect impacts** are reasonably foreseeable effects caused by Proposed Project implementation on adjacent biological resources outside the direct disturbance zone. Indirect impacts may affect areas outside the disturbance zone, including open space and areas within the BSA. Indirect impacts may be short-term and construction-related (i.e., occur in a different place than project construction), or long-term in nature and associated with development in proximity to biological resources (i.e., occur at a different time).

In the event that adverse environmental impacts would occur even with consideration of applicable policies and regulations and the Standard Construction Practices described in Chapter 3, Project Description, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.3.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance as described below.

- **Conflict with Adopted Policies or Regulations (Significance Threshold E).** The Proposed Project is critical to the operation, utilization, storage, and transmission of water supplies, and therefore, is legally exempt under California Government Code Section 53091 (d) and (e) from the County of Santa Cruz and City of Santa Cruz building and zoning ordinances. The Proposed Project would be constructed consistent with the City policies, plans and ordinances. All project pipe sections are located outside of the coastal zone and would not be subject to local policies and regulations set forth in the County or City LCP.

  The BSA contains riparian trees that may be removed for construction near Zayante Creek (Graham Hill Road North pipe section). However, these trees are not protected by County tree removal regulations, which apply to significant trees in the coastal zone, because the Proposed Project is not located in the coastal zone. Additionally, tree removal would not be subject to the City's creek management or heritage tree regulations as this area is not located within the City. Impacts to riparian habitat and vegetation are further addressed in Impact BIO-2. No trees are planned for removal in other locations.

  Therefore, the Proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as tree preservation ordinances. As a result, there would be no impacts related to conflict with local policies or ordinances.

- **Conflict with an Adopted Habitat Conservation Plan or Natural Community Conservation Plan (Significance Threshold F).** The Proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. There are no Natural Community Conservation Plans in the region. As previously indicated, three Habitat Conservation Plans have been adopted and approved by the USFWS within the BSA: the County and City of Scotts Valley Interim Programmatic Habitat Conservation Plan (IPHCP), the City's Operations and Maintenance Habitat Conservation Plan (O&M HCP), and the City's GHWTP LE HCP.

  IPHCP. The Graham Hill Road North and South sections of the Proposed Project would occur next to the IPHCP Project Units along Graham Hill Road. However, this plan is intended to authorize incidental take of covered species for small residential development projects only, and does not include take coverage for the Zayante band-winged grasshopper or other listed Sandhills habitat plants that may result from implementing region-wide projects such as the Proposed Project. Regardless, the impacts and compensatory mitigation associated with the Proposed Project would be consistent with the

provisions, and minimization and mitigation measures contained in the IPHCP. Therefore, the Proposed Project would not conflict with provisions of the IPHCP.

O&M HCP. The Proposed Project has been designed by the City to be consistent with the conservation strategies and objectives of the O&M HCP. Therefore, the Proposed Project would not conflict with provisions of the O&M HCP.

GHWTP LEHCP. The Proposed Project is not considered a covered activity under the LE HCP. Regardless, the impacts and compensatory mitigation associated with the Proposed Project would be consistent with the provisions, and minimization and mitigation measures contained in the LE HCP. Therefore, the Proposed Project would not conflict with the LE HCP.

Additionally, the USFWS has approved 15 other individual low-effect HCPs for the Mount Hermon June beetle, Zayante band-winged grasshopper, California red-legged frog, Santa Cruz wallflower, and/or Ben Lomond spineflower. One other HCP for a local project (Santa Cruz Gardens) that provided take coverage for the Ohlone tiger beetle, Santa Cruz tarplant, and Gairdner's yampah was previously approved by the USFWS within the BSA. However, these HCPs were executed in the early 2000s, have exceeded their term limits, and are no longer in effect. The City is also developing the Anadromous Salmonid HCP with NOAA Fisheries and CDFW for City water-system operation and maintenance activities that may affect special-status anadromous salmonids. The Proposed Project would not result in any changes to operations or maintenance activities that would conflict with implementation of the ASHCP once it's finalized. There are no other approved local, regional, or state habitat conservation plans in the vicinity. Therefore, the Proposed Project would have no impact on any such plans.

- **Substantially Reduce Fish or Wildlife Species Habitat (Significance Threshold G).** The Proposed Project does not have the potential to substantially reduce the habitat of fish or wildlife species. The Project would not result in permanent changes to fish habitat in the San Lorenzo River or its tributaries and would not appreciably reduce existing habitat or degrade aquatic conditions for fish species that may be present in these locations. The Project does have the potential to impact other aquatic or terrestrial wildlife species, including special-status species, as a result of ground disturbance associated with Project staging and construction activities. Project-related ground disturbance would result in temporary impacts, but would not result in permanent loss of habitat. Therefore, the Project would not substantially reduce the habitat of a fish or wildlife species.

- **Cause a fish or wildlife population to drop below self-sustaining levels or threaten to eliminate a plant or animal community (Significance Thresholds H and I).** The proposed Project would not threaten to eliminate a plant or animal community. The Project would involve the removal of vegetation that could impact individual plant and animal species, which can be mitigated to a less-than-significant level. None of the Proposed Project components, either individually or collectively, would cause the elimination of entire plant or animal communities. Although some sensitive vegetation communities occur very close to the Proposed Project alignment and may be temporarily impacted during construction, mitigation measures will be implemented to avoid or minimize impacts to these communities. In addition, development of a site-specific revegetation and restoration plan, as described in the mitigation measures below (MM BIO-10), will detail the site-specific measures to offset impacts to sensitive habitats.

Project Impacts

Impact BIO-1A: Special-Status Plant Species (Significance Threshold A and J). The Proposed Project could have a substantial adverse effect on special-status plant species during construction. ***(Less than Significant with Mitigation)***

Three special-status plant species were detected during the focused botanical surveys within the BSA: silverleaf (Bonny Doon) manzanita, Ben Lomond spineflower, and Ben Lomond buckwheat. Suitable habitats for these species within the BSA include coyote brush scrub, Douglas fir forest and woodland, Douglas fir-tanoak forest and woodland, ponderosa pine forest and woodland, and silverleaf manzanita chaparral. Proposed Project pipe sections that are located in areas with observed or potential special-status plants include:

- Northern segment: Newell Creek Road, Glen Arbor Road, Brackney South, and San Lorenzo Way
- Southern segment: Graham Hill Road North, Graham Hill Road South and Pipeline Road and San Lorenzo Lumber Yard sections of existing NCP

Direct Impacts

Direct impacts to silverleaf (Bonny Doon) manzanita and Ben Lomond spineflower could result from project construction activities in the Graham Hill Road North pipe section. Direct permanent impacts associated with installation of the new pipeline could result in crushing of individuals (if present) and permanent habitat loss for these species within project work areas. A third special-status plant, Ben Lomond buckwheat, was also identified in the BSA, but is located outside of project work areas. Potential direct impacts could occur to other special-status plant species with a high potential to occur (minute pocket moss, Santa Cruz tarplant, northern curly-leaved monardella, woodland woolythreads, Choris' popcornflower, San Francisco popcornflower) in the Newell Creek Road, Glen Arbor Road, Brackney South, San Lorenzo Way, Pipeline Road, and San Lorenzo Lumber Yard sections that were not included in the 2021 focused botanical survey.

Construction activities would primarily be located within the existing road pavement where the pipeline would be installed. While construction activities associated with the installation of the new pipeline would occur within a narrow, disturbed/developed ROW, some temporary disturbance could occur to special-status plants, if present, adjacent to the paved road. Inadvertent damage to such plants could occur from movement of construction workers or equipment on the side of the road adjacent to the work area, which could crush or damage special status plants. The loss of individuals or occupied habitat of these species could further reduce their regional population viability, and therefore, direct impacts would be considered potentially significant before mitigation. However, with mitigation, impacts would be less than significant and the Proposed Project would not substantially reduce the number or restrict the range of a rare or endangered plant.

Indirect Impacts

Construction-related dust, soil erosion, and water runoff could indirectly impact individual special-status plants or their habitat outside but adjacent to Proposed Project work areas (i.e., within the BSA but outside work areas). Indirect impacts to special-status plants that could occur during construction include generation of a limited amount of dust in the immediate vicinity of areas potentially occupied by special-status plants. These impacts would be less than significant based on the type, limited duration, and extent of construction activities

in the vicinity of special-status plant populations. Potential indirect impacts would be further reduced with the implementation of the Standard Construction Practices that would serve to avoid or minimize erosion and water quality impacts.

Impacts to special-status plant species would not result from operation and maintenance activities because these activities would not entail vegetation removal, given the proposed location of the pipe in developed and/or disturbed ROWs. Therefore, operations of the Proposed Project would result in no impacts to special-status plants.

Mitigation Measures

Implementation of the Mitigation Measures BIO-1, BIO-2, and BIO-3 would reduce potentially significant impacts to special status plant species during construction to a less-than-significant level.

MM BIO-1 **Project Siting (Applicable to all Proposed Project sections).** The City shall protect the specific locations of any sensitive biological resources, including special-status plants, special-status wildlife, sensitive vegetation communities and habitat areas, and jurisdictional aquatic resources, that are outside of but adjacent to construction work areas to minimize disturbance to these resources. These locations shall be identified prior to construction and impacts to such resources will be avoided and minimized through placement of protective measures, such as fencing, staking and/or flagging to prevent equipment or workers from temporarily encroaching within these areas. Warning signs shall be posted on the temporary fencing to alert workers not to proceed beyond the fence, including the following language: "Notice: Sensitive Habitat Area. Do Not Enter." The specific locations of sensitive biological resources to be protected will be identified by a qualified biologist and protective measures will be installed prior to the commencement of construction.

No ground disturbing activities will occur outside existing developed areas and maintained road rights-of-way (ROW) to avoid and minimize impacts to special-status plants, special-status wildlife, sensitive vegetation communities, sensitive habitats, and aquatic resources.

MM BIO-2 **Special-Status Plant Surveys (Applicable to all Proposed Project sections).** To identify special-status plants or plant patches to be avoided under MM BIO-1, a qualified botanist shall survey Proposed Project work areas not covered in 2021 surveys in accordance with standard protocols (CNPS 2001, CDFW 2018, USFWS 2000) prior to construction. The botanist shall also revisit the 2021 botanical survey area to confirm the absence of special-status plants from any direct impact areas (e.g., staging areas, excavation footprints) included in final construction drawings (areas outside direct impact areas that were surveyed in 2021 would not need to be rechecked). The botanist or another qualified biologist with native plant identification training shall be present on site during the placement of protective fencing, staking, and/or flagging so that plants and their root zones are adequately protected from construction activities.

MM BIO-3 **Special-Status Plant Compensation.** If any special-status plant occurrences are found in future surveys and cannot be avoided, a plan focused on compensating for impacts to these species shall be developed by the City prior to construction and implemented. This plan shall be a

component of the project's overall Habitat Mitigation and Monitoring Plan described in MM BIO-10 and include the following elements:

a. Description and quantification of special-status plant occurrences that would be impacted by the project;
b. Identification and evaluation of on- or off-site areas for preservation of existing special-status plant occurrences or propagation of new occurrences using seeds from impacted occurrences;
c. Analysis of appropriate and viable planting or propagation techniques, seed-collection techniques, and seeding rates for impacted species;
d. A description of specific performance standards, including a required replacement ratio and minimum success standard of 1:1 for impacted individuals or populations;
e. A monitoring and reporting program to ensure mitigation success; and
f. A description of adaptive management and associated remedial measures to be implemented in the event that performance standards are not achieved.

Impact BIO1B: Special-Status Wildlife Species (Significance Thresholds A and J). The Proposed Project could have a substantial adverse effect on special-status wildlife species during construction. ***(Less than Significant with Mitigation)***

The BSA for the Proposed Project has a moderate to high potential to support 13 special-status wildlife species: two invertebrates associated with Sandhills habitat (Mount Hermon June beetle and Zayante band-winged grasshopper), one fish (steelhead), two amphibians (Santa Cruz black salamander and California giant salamander), one reptile (western pond turtle), two birds (olive-sided flycatcher and white-tailed kite), and five mammals (pallid bat, Townsend's big-eared bat, western red bat, Santa Cruz kangaroo rat, and San Francisco dusky-footed woodrat). Three federally listed species evaluated, but not expected to occur within the BSA, include the California red-legged frog, coho salmon, and marbled murrelet. Additionally, the native trees and shrubs within the BSA provide suitable nesting habitat for bird species protected under the MBTA and CFGC Section 3500 and roosting bats protected under CFGC Section 4150.

Direct Impacts

Construction activities would primarily occur within the existing road pavement, road ROW, and/or existing City easements where the pipeline would be installed. However, there is potential for direct impacts to special-status wildlife species to occur if individuals are present at the time of construction. Any direct impacts to special-status wildlife would be largely limited to areas within the disturbance footprint of the new pipeline. As discussed above, construction activities may impact special-status wildlife species located in or adjacent to the work area. However, with mitigation, impacts would be less than significant and the Proposed Project would not substantially reduce the number or restrict the range of a rare or endangered wildlife species.

Mount Hermon June beetle, Zayante Band-winged Grasshopper, and Santa Cruz Kangaroo Rat. These special-status wildlife species have a moderate to high potential to occur within the BSA where Sandhills habitat has been identified. Construction-related activities could have a substantial adverse effect on these species, if present, because of their rarity and the limited extent of the Sandhills ecosystem on which they depend. Any mortality of individuals or permanent habitat loss could further contribute to population declines of these

already rare species. Ground disturbance and installation of new piping could result in direct impacts to habitat for these species (including designated critical habitat for Zayante band-winged grasshopper) within staging and work areas. The extent of direct impacts to these species would depend on the exact location of the work areas relative to Sandhills habitat and whether such habitat is occupied by these species. The impact would be potentially significant if avoidance is not possible.

Impacts to Mount Hermon June beetle may occur in areas of the ROW with Zayante sand soils, including developed and disturbed areas. Impacts to Santa Cruz kangaroo rat may occur near the historic occurrences at Mount Hermon/Graham Hill Road (Graham Hill Road North section) and in the vicinity of suitable silverleaf manzanita chaparral habitat in the Newell Creek Road, Glen Arbor, and southern portion of the Graham Hill Road South sections. The Zayante band-winged grasshopper has a moderate potential to occur in road turnouts on Zayante soils adjacent to silverleaf manzanita chaparral in the Newell Creek Road and Graham Hill Road North sections, but low or no potential of occurrence in other Proposed Project sections (McGraw 2021a). Impacts to the Zayante band-winged grasshopper may occur during construction in the Newell Creek Road and Graham Hill Road North sections of the Proposed Project, if present.

Santa Cruz Black Salamander, California Giant Salamander, Western Pond Turtle, and San Francisco Dusky-footed Woodrat. These special-status wildlife species have a moderate to high potential to occur within the BSA. Construction-related activities resulting in ground-disturbance during pipeline installation could have a substantial adverse effect on these species, if present, because any mortality of individuals or permanent habitat loss would further contribute to population declines of these species. The extent of impacts to these species would vary depending on the exact location of the work areas and habitat present. The impact would be potentially significant if avoidance is not possible.

Construction activities would occur adjacent to several creeks during staging and construction of pipeline creek crossings in the northern section of the Graham Hill Road North section at Zayante Creek and in the Newell Creek Road and Glen Arbor Road sections at Newell Creek. In addition, Newell Creek is located east of the Proposed Project construction disturbance corridor in the Newell Creek Road and Glen Arbor Road sections. Further, the San Lorenzo River is located west of the Brackney North, Brackney South, and San Lorenzo Way sections. There is potential for direct impacts to individual Santa Cruz black salamanders, California giant salamanders, and/or western pond turtles potentially occurring in creeks and drainages if they wander into construction areas from adjacent aquatic habitat. Impacts to San Francisco dusky-footed woodrat may occur if occupied middens are located within or near construction work areas. It is anticipated that the Newell Creek crossings would be installed by attaching the pipeline to existing bridge structures, similar to current conditions, and the crossing at Zayante Creek would be over the creek on existing abutments. Utilizing existing infrastructure and alignments would avoid impacts to habitat for the above special-status wildlife because no habitat would be permanently removed or otherwise degraded by project activities.

Olive-sided Flycatcher, White-tailed Kite, Pallid Bat, Townsend's Big-eared Bat, Western Red Bat and Other Species protected under the MBTA. Vegetation and tree removal during project grading activities could result in direct impacts to olive-sided flycatcher, white-tailed kite, pallid bat, Townsend's big-eared bat, western red bat, and other nesting birds and roosting bats. The BSA contains suitable nesting habitat for ground and tree-nesting bird species and roosting bats, particularly within the riparian areas and the undeveloped lands surrounding the work areas. Indirect impacts to nesting birds and roosting bats could result from an increase in human activity and/or construction noise in the immediate vicinity of an active nest that could result in

significant harassment and nest abandonment, causing loss of the nest. Therefore, the impact of the Proposed Project on nesting birds and roosting bats would be potentially significant.

Generally, no tree removal is proposed in the Graham Hill Road North (except at the Zayante Creek crossing) or Graham Hill Road South sections, although some tree trimming could occur adjacent to roads in all Project sections. At the Zayante Creek crossing at the northern end of the Graham Hill Road North section, it is estimated that approximately 4–8 riparian trees may be removed to install the pipe on existing abutments. Tree removal may also be required in the Brackney Road work area within the Brackney North section.

Therefore, there is potential for direct impacts to nesting birds and roosting bats, particularly during the general nesting season of February 1 through August 31 or bat maternity season of March 1 through August 31. Special-status birds with high potential to occur (olive-sided flycatcher and white-tailed kite) would be impacted if project activities removed vegetation supporting active nests or caused noise or visual disturbance resulting in the abandonment of eggs or recently hatched nestlings. Similarly, special-status bats with moderate potential to roost in or near Project construction areas (pallid bat, Townsend's big-eared bat, and western red bat) would be impacted if project activities removed trees supporting an active maternity roost or caused noise or visual disturbance resulting in the abandonment of dependent young.

Steelhead. This listed fish species may occur within the BSA but is not expected to occur within the proposed work areas at Newell Creek or Zayante Creek. Dewatering would not be required for any project activities. As a result, the Proposed Project is not expected to have any direct impact on steelhead. Indirect impacts associated with decreased water quality during construction downstream of the work areas are not expected with implementation of the Standard Construction Practices. Downstream reaches of major creeks within the BSA would continue to receive base flows during construction to support these species. The Proposed Project would not adversely affect the quality or availability of suitable spawning and rearing habitat for steelhead located downstream of the Proposed Project, and no construction is proposed within Zayante Creek or Newell Creek. For these reasons, the Proposed Project would have no impact on steelhead.

Indirect Impacts

Short-term indirect impacts to special-status wildlife species that could occur during construction include increased disturbance from human activity and noise in the immediate vicinity of potentially occupied areas. Operation of construction equipment during vegetation removal, excavation, and pipeline installation at creek crossings could temporarily interrupt the feeding and breeding cycles of Santa Cruz black salamander, California giant salamander, western pond turtle and San Francisco dusky-footed woodrat, if present. Dust generated during construction can clog the spiracles (openings of the tracheal system) of adult Mount Hermon June Beetles and accumulated dust on plants can indirectly affect this species by reducing the health of plants that larvae feed on. Standard Construction Practices for dust control (#4) would reduce potential indirect impacts to this species from airborne dust.

Additionally, construction noise during the bird nesting season (February 1 through August 31) or bat maternity season (generally spring to late summer), could result in indirect impacts to nesting birds and roosting bats, if present. Specifically, indirect impacts to nesting birds and roosting bats from short-term construction-related noise could result in decreased reproductive success, disrupted feeding, or abandonment of a nest or roost site.

Indirect impacts associated with decreased water quality during construction downstream of the work areas are not expected with implementation of the Standard Construction Practices that would minimize/prevent erosion of sediments into water bodies (#1-4) and prevent other contaminants from resulting in water quality degradation (#5-9).

Operation and maintenance activities under the Proposed Project would not result in significant impacts to special-status wildlife, as such activities would not involve construction or substantial ground disturbance. No new lighting would be added to the project area and operations and maintenance activities would be similar to existing conditions. Therefore, operation of the Proposed Project would result in less-than-significant impacts to special-status wildlife species.

Mitigation Measures

Implementation of the Mitigation Measures BIO-1 (see Impact BIO-1A), MM BIO-4 (Sandhills Species Compensation), MM BIO-5 (Mount Hermon June Beetle Protection) MM BIO-6 (Conduct Special-Status Amphibian and Reptile Species Survey and Monitoring), MM BIO-7 (Conduct San Francisco Dusky-Footed Woodrat Survey and Relocation), MM BIO-8 (Conduct Preconstruction Nesting Bird Survey), MM BIO-9 (Conduct Preconstruction Roosting Bat Survey) and MM BIO-10 (Biological Construction Monitoring), as well as Standard Construction Practices #1-4 (erosion control), #5-9 (water quality protection), and #16 (worker training), would reduce potentially significant direct and indirect impacts to special-status wildlife species to a less-than-significant level.

Rehabilitation and enhancement activities within Zayante soils will include revegetation of disturbed areas with plants native to the Sandhills habitat (on Zayante soils) and overlap with habitat restoration activities provided in MM BIO-10 (Sensitive Vegetation Communities Compensation). These revegetated areas will not include any landscape elements that degrade habitat for the special-status species, including mulch, bark, weed matting, rock, aggregate, or turf grass.

MM BIO-4 **Sandhills Special-Status Wildlife Protection and Compensation (Applicable to Proposed Project Newell Creek Road, Glen Arbor, Graham Hill Road North and Graham Hill Road South sections).** Direct temporary impacts to suitable Sandhills habitat for the Mount Hermon June beetle and/or Zayante band-winged grasshopper (and individuals) shall be addressed through either the Section 7 or Section 10(a)(1)(B) process under the federal Endangered Species Act (ESA) of 1973, as amended. Alternatively, the City may seek concurrence with USFWS that implementation of appropriate avoidance and minimization measures set forth in the existing O&M HCP would ensure approved levels of incidental take are not exceeded due to project activities. Compensatory mitigation for the temporary loss of suitable habitat (and individuals) shall be provided at a minimum 1:1 ratio or at other ratios as determined through consultation with USFWS. The City has available acreage at its existing Bonny Doon mitigation site which provides high quality Mount Hermon June Beetle habitat, per the Low-Effect HCP issued for GHWTP activities; this site may be utilized to compensate for any temporary impacts to Mount Hermon June Beetle resulting from the Proposed Project. Once the take authorization has been provided for the Proposed Project, if necessary, relevant conservation measures shall be implemented.

MM BIO-5 **Mount Hermon June Beetle Protection (Applicable to Proposed Project Newell Creek Road, Glen Arbor, Graham Hill Road North and Graham Hill Road South sections).** To reduce potential

impacts to Mount Hermon June Beetle, exposed soils disturbed in areas of Zayante soils shall be covered during the active breeding season (May 15 through August 15) between the hours of 7pm and 7am daily. All exposed soils shall be covered by tarps, plywood, erosion control fabric, or other suitable impervious material. This will prevent adult males from burrowing into the exposed soils and subsequently being injured or killed by soil disturbance.

MM BIO-6 **Conduct Special-Status Amphibian and Reptile Species Survey and Monitoring (Applicable to Proposed Project Newell Creek Road, Glen Arbor Road, and Graham Hill Road North sections).** A pre-construction survey for Santa Cruz black salamander, California giant salamander, and western pond turtle shall be conducted within 48 hours prior to the initiation of ground disturbance in suitable habitat for these species (i.e., damp upland areas near/adjacent to existing aquatic features associated with creeks, and the wetted portion of creeks). The survey area shall include all suitable habitat within work areas, plus a 50-foot buffer. Following the survey, the contractor, under the direction of a qualified biologist, shall install wildlife exclusion fencing (WEF) along the boundary of the work area containing suitable habitat to prevent special-status amphibians and reptiles from entering the work area. WEF must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length, and must have intermittent exit points. Turn-arounds shall be installed at access points to direct amphibians and reptiles away from gaps in the fencing. A daily pre-construction sweep for wildlife within all staging and work areas shall be conducted and a qualified biologist shall inspect WEF at least weekly when work is conducted within suitable habitat.

If any individuals of Santa Cruz black salamander, California giant salamander or western pond turtle are observed during the pre-construction survey or construction, their location(s) shall be recorded and they should be allowed to move out of the area on their own. Alternatively, they shall be moved to the nearest appropriate habitat outside of the work area by a qualified biologist with applicable regulatory approvals to capture, handle, and translocate these species.

To avoid entrapment of special-status as well as common amphibian and reptiles during construction, any trenches or pits measuring 1 foot or greater in depth that must be left open at the end of a day's construction activities shall be either covered or encircled with WEF, or the end of any open walls shall be ramped at an approximate 2:1 slope to allow any wildlife that enters the excavation to escape. A qualified biologist may approve the use of an alternative method to prevent ingress or entrapment.

MM BIO-7 **Conduct San Francisco Dusky-Footed Woodrat Survey and Relocation (Applicable to Proposed Project Newell Creek Road, Brackney North, Brackney South, San Lorenzo Way, Felton Booster Pump Station, and Graham Hill Road North sections).** A pre-construction survey to locate woodrat middens shall be conducted by a qualified biologist no more than 14 days prior to the onset of construction activities. The survey area shall include all suitable habitat within the work areas, plus a 50-foot buffer. Woodrat middens found shall be photographed, mapped and flagged with high visibility flagging tape or fenced for avoidance. If middens are found and complete avoidance is not feasible, the following measures shall be implemented after obtaining approval from CDFW to avoid and reduce impacts on San Francisco dusky-footed woodrat:

a. A qualified biologist shall dismantle the nest by hand to allow for adult San Francisco dusky-footed woodrat individuals to escape (this work shall be conducted outside of the breeding season for this species which is April through June);

b. If young are observed during the dismantling process, the qualified biologist shall stop work for a minimum of 24 hours to allow the adult woodrats to relocate their young;

c. Once the nest is determined to be vacant, the dismantling process shall be completed and the nest materials shall be collected and moved to another suitable location nearby and outside of the construction footprint to allow for nest reconstruction; and

d. Where feasible, piles of cut vegetation and slash generated by project clearing and grubbing activities shall be left outside of, but near the work area, to provide refuge for woodrats that may become displaced by project activities.

MM BIO-8 **Conduct Preconstruction Nesting Bird Surveys (Applicable to Proposed Project Graham Hill Road North section and any section where tree or vegetation removal is proposed).** Vegetation removal activities shall be conducted outside the bird nesting season (February 1 through August 31) as much as possible to avoid direct impacts to nesting birds. For construction and vegetation removal activities occurring during the nesting season, an avian nesting survey of the work areas and contiguous habitat within 300 feet of all impact areas must be conducted for protected migratory birds and active nests. The avian nesting survey shall be performed by a qualified wildlife biologist within 14 days prior to the start of vegetation removal or construction activities. Once construction has started, if there is a break in activities that exceeds 14 days, then another avian nesting survey shall be conducted. If an active bird nest is found, the nest shall be flagged and mapped on the construction plans along with an appropriate no disturbance buffer, which will be determined by the biologist based on the species' sensitivity to disturbance. The nest area shall be avoided until the nest is vacated and the juveniles have fledged. The no disturbance buffer shall be demarcated in the field with flagging and stakes or construction fencing as determined appropriate by the biologist.

MM BIO-9 **Conduct Preconstruction Roosting Bat Survey (Applicable to Proposed Project Newell Creek Road, Brackney North, Brackney South, San Lorenzo Way, Felton Booster Pump Station, and Graham Hill Road North sections).** To the extent practicable, tree removal should occur outside peak bat activity timeframes when young or overwintering bats may be present, which generally occurs from March through April and August through October, to ensure protection of potentially occurring bats and their roosts within work areas. Additionally, daily restrictions on the timing of any construction activities should be limited to daylight hours to reduce disturbance to roosting (and foraging) bat species. Additionally, a visual bat survey should be conducted within 30 days prior to the removal of any trees and commencement of construction activities. The survey should include a determination on whether any active bat roosts are present on or within 50 feet of the project work areas. If a non-breeding and non-wintering bat colony is found, the individuals shall be evicted under the direction of a qualified biologist to ensure their protection and avoid unnecessary harm. If a maternity colony or overwintering colony is found within the work areas, then the qualified biologist shall establish

a suitable construction-free buffer around the location. The construction-free buffer shall remain in place until the qualified biologist determines that the nursery is no longer active.

MM BIO-10 **Biological Construction Monitoring (Applicable to all sections with off-pavement ground disturbance).** A qualified biologist shall monitor vegetation removal and initial ground disturbing construction activities for off-pavement work and conduct periodic monitoring inspections for all other construction activities. The monitor shall check any installed WEF (MM BIO-6) and buffers for any active nesting birds (MM BIO-7) encountered at least once a week, and if nesting birds are determined to be present, shall verify when the young have fledged before commencement of construction activities in proximity to the nest. The biologist shall have stop-work authority in the event that a protected species is found within the active construction footprint. During construction, the biological monitor shall keep a daily observation log and a photo log to describe monitoring activities, remedial actions, non-compliance, and other issues and actions taken. These logs shall be kept on-site or tracked in a digital database and made available for inspection by agency personnel.

Impact BIO-2: **Sensitive Vegetation Communities (Significance Threshold B).** The Proposed Project could have a substantial adverse effect on sensitive vegetation communities and habitats during construction. ***(Less than Significant with Mitigation)***

As previously discussed in Section 4.3.1.4, a total of 13 sensitive natural communities were identified as occurring within the BSA as summarized on Table 4.3-4. These include riparian, Sandhills and Special Forest habitats.

Direct Impacts

The Proposed Project would result in ground disturbance and removal of vegetation as necessary to install the replacement pipeline. As discussed previously, a large majority of the Proposed Project footprint will be sited within the existing disturbed ROW or within existing roads, and most of the creek crossings would utilize existing pipeline creek crossing infrastructure. However, portions of riparian vegetation communities, Special Forest, and Sandhills habitat occur very close to the Proposed Project alignment and may be temporarily impacted during construction due to movement of construction workers and equipment. Specifically, the following sensitive vegetation communities could be directly impacted: black cottonwood forest and woodland, box-elder forest and woodland, California bay forest and woodland, California sycamore woodland, Douglas fir- tanoak forest and woodland, redwood forest and woodland, and silverleaf manzanita chaparral. All of the Proposed Project pipe sections are located within or partially within sensitive vegetation communities and habitats as follows:

- Northern segment: Newell Creek Road (riparian, sandhills), Glen Arbor Road (riparian, sandhills, special forest), Brackney North (riparian, but no disturbance), Brackney South (riparian), San Lorenzo Way (riparian), Felton Pump Station (riparian) sections
- Southern segment: Graham Hill Road North (riparian, sandhills, special forest), Graham Hill Road South (sandhills) section

The areal extent of impacts would depend on the exact location of work areas. While construction activities associated with the installation of the new pipeline are likely to be located within a narrow, disturbed/developed ROW, some temporary disturbance could occur to natural vegetation communities. In particular, temporary disturbance could occur in the work area adjacent to Zayante Creek in the northern end of the Graham Hill Road North section where improvements to an existing dirt trail would be completed to provide access to the work area for installation of the pipe over the creek. The Proposed Project also includes installation of an additional abutment to support the pipe, which would not be within the creek channel, but would be within riparian habitat. It is estimated that approximately 4–8 riparian trees may be removed to install the pipe on existing abutments, and trees may be removed at the southern staging area for the Brackney North section.

Direct temporary impacts associated with project construction could occur to sensitive vegetation communities depending upon the final pipeline alignment. The extent of impacts would vary depending on the exact location and the natural resources present. Although impacts would not threaten to eliminate a riparian or sensitive natural vegetation community as a result of the proposed project, the impact would be potentially significant if avoidance is not possible, even with the implementation of the Standard Construction Practices listed above in Section 1.2.3.

Indirect Impacts

Construction-related dust, soil erosion, and water runoff could indirectly impact sensitive vegetation communities outside but adjacent to Proposed Project work areas. These potential effects would be short-term and are unlikely to result in significant indirect impacts to such communities with implementation of Standard Construction Practices to minimize erosion (#1-4) and protect water quality (#5-9) and habitat (#13-14).

Mitigation Measures

Implementation of the Mitigation Measures BIO-1 (see Impact BIO-1A) and MM-BIO-11 (Sensitive Vegetation Communities Compensation) as well as Standard Construction Practices #1-4 (erosion control), #5-9 (water quality protection), and #13 minimize disturbance of riparian habitat) would reduce potentially significant direct and indirect impacts to sensitive vegetation communities to a less-than-significant level.

MM-BIO-11 **Sensitive Vegetation Communities Compensation (Applicable to Proposed Project Newell Creek Road, Glen Arbor Road, Graham Hill Road North, and Graham Hill Road South sections).** Direct temporary impacts to sensitive vegetation communities shall be mitigated via a combination of on-site and off-site measures. On-site measures shall include rehabilitation for areas temporarily impacted at a 1:1 mitigation ratio. All areas temporarily impacted shall be returned to conditions similar to those that existed prior to grading and/or ground-disturbing activities. It is anticipated that a one-time restoration effort at the completion of the project followed by monitoring and invasive weed removal for a minimum of 3 years would adequately compensate for the direct temporary impacts to these vegetation communities. A Habitat Mitigation and Monitoring Plan shall be prepared and implemented to compensate for the loss of all sensitive vegetation communities (see below).

Rehabilitation and enhancement activities with Zayante soils will be revegetated with plants native to the Sandhills habitat (on Zayante soils), such as sticky monkeyflower (*Mimulus*

aurantiacus), deer weed (*Lotus scoparius*), and silver bush lupine. These native plants will provide suitable habitat conditions for special-status species that might eventually colonize the temporarily impacted portion of the impact area. These revegetated areas will not include any landscape elements that degrade habitat for the special-status species, including mulch, bark, weed matting, rock, aggregate, or turf grass.

The Habitat Mitigation and Monitoring Plan shall detail the habitat restoration activities and shall specify the criteria and standards by which the revegetation and restoration actions will compensate for impacts of the Proposed Project on sensitive vegetation communities and shall at a minimum include discussion of the following:

a. The rehabilitation and enhancement objectives, type, and amount of revegetation to be implemented taking into account enhanced areas where non-native invasive vegetation is removed and replanting specifications that take into account natural regeneration of native species when applicable.
b. The specific methods to be employed for revegetation.
c. Success criteria and monitoring requirements to ensure vegetation community restoration success.
d. Remedial measures to be implemented in the event that performance standards are not achieved.

Impact BIO-3: Jurisdictional Wetlands and Waters (Significance Threshold C). The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts. ***(Less than Significant with Mitigation)***

As discussed in Section 4.3.1.5, potentially jurisdictional aquatic resources identified in the field included perennial and intermittent streams, ephemeral drainages, and wetlands. Approximately 86 non-wetland waters and 1 wetland were identified within the BSA. The majority of the non-wetland waters are ephemeral drainages and include ditches, swales, and culverts. There are six major, named streams and creeks within the BSA: San Lorenzo River, Newell Creek, Zayante Creek, Bean Creek, Eagle Creek, and Powder Mill Creek, along with other unnamed drainages as illustrated on Figure 4 in Appendix B.

Direct Impacts

Direct permanent impacts within flowing creeks and streambeds would be avoided. No other direct permanent impacts to potentially jurisdictional aquatic resources are anticipated since the Proposed Project will use existing creek crossings and has been designed to avoid drainages, where feasible.

Implementation of the Proposed Project could have direct temporary effects on aquatic resources subject to regulation by the USACE, RWQCB, and CDFW. Construction impacts would avoid the active stream channel but could include temporary disturbance to associated riparian vegetation potentially subject to RWQCB and/or CDFW jurisdiction under the Porter-Cologne Water Quality Control Act and Section 1602 of the California Fish and Game Code, respectively. Potentially jurisdictional aquatic resources identified along the Graham Hill Road North, Newell Creek Road, Pipeline Road, and San Lorenzo Way pipeline sections occur near the proposed work areas. Direct temporary impacts to jurisdictional aquatic resources could occur as a result of project

implementation and would be potentially significant. The extent of direct impacts to aquatic resources would depend on the exact location of the work areas and activities relative to delineated aquatic resources.

Indirect Impacts

Construction-related soil erosion and water runoff could indirectly impact jurisdictional aquatic resources outside but adjacent to or downstream of Proposed Project work areas. However, these effects are unlikely to result in significant indirect impacts to aquatic resources because of Standard Construction Practices to minimize erosion and protect water quality.

No short-term or long-term indirect impacts to aquatic resources following construction activities (edge effects) would occur with implementation of the Standard Construction Practices. Therefore, the indirect impact of the Proposed Project on aquatic resources would be less than significant.

Mitigation Measures

Implementation of the Mitigation Measures BIO-1 (see Impact BIO-1A), MM-BIO-12 (Aquatic Resource Avoidance) and MM-BIO-13 (Aquatic Resource Compensation) would reduce potentially significant direct and indirect impacts to aquatic resources to a less-than-significant level. Where practicable, aquatic resources mitigation shall overlap with measures taken to address impacts to sensitive vegetation communities (as identified above in MM-BIO-11).

MM BIO-12 **Aquatic Resource Avoidance.** Future refinements to the Proposed Project shall avoid jurisdictional aquatic resources regulated by the U.S. Army Corps of Engineers, Regional Water Control Board, and California Department of Fish and Wildlife, to the maximum extent practicable. As described in MM BIO-1, where feasible and appropriate, all jurisdictional aquatic resources not directly affected by construction activities will be avoided and protected by establishing staking, flagging or fencing between the identified construction areas and aquatic resources to be avoided.

MM BIO-13 **Aquatic Resource Compensation**. For any unavoidable impacts to jurisdictional aquatic resources, the City shall ensure that there is no net loss of such resources. This shall be accomplished by providing compensatory mitigation at a minimum ratio of 1:1 for temporary impacts and 2:1 for permanent impacts, or at other ratios as determined through negotiations with the regulatory agencies. A project-specific mitigation plan shall be developed for submittal to the U.S. Army Corps of Engineers, Regional Water Control Board, and/or California Department of Fish and Wildlife, as appropriate, through their respective regulatory permitting processes, and implemented. The mitigation plan shall specify the criteria and standards by which the mitigation will compensate for impacts of the Proposed Project and include discussion of the following:

a. The mitigation objectives and type and amount of mitigation to be implemented;
b. The location of the proposed mitigation site(s) (within the San Lorenzo River watershed, if possible);
c. The methods to be employed for mitigation implementation (jurisdictional aquatic resource establishment, re-establishment, enhancement, and/or preservation);

d. Success criteria and a monitoring program to ensure mitigation success; and
e. Adaptive management and remedial measures in the event that performance standards are not achieved.

Impact BIO-4: Wildlife Corridors (Significance Threshold D). The Proposed Project would not substantially degrade the quality or interfere with the use of a wildlife corridor or migratory route, or otherwise impede wildlife movement or use of native wildlife nursery sites. ***(Less than Significant)***

Direct Impacts

Implementation of the Proposed Project could have minor direct impacts to habitat which could support wildlife movement. As discussed above, the BSA is not within an important regional wildlife corridor. However, several streams and drainages that cross the proposed alignment may serve as local movement corridors that marginally connect habitat for certain amphibians, reptiles, and localized fish species. Overall, the proposed project would not substantially alter the vegetation communities or physical setting of the BSA because most work would be conducted along the existing developed pipeline ROW.

As noted previously, the Proposed Project is largely located within and along existing roadways and open easements. During construction, project activities could block or otherwise hinder wildlife movement along the Project alignment or temporarily affect the ability of wildlife to access other habitat areas upstream or downstream of where jurisdictional features intersect the BSA and Project alignment. However, this impact would be temporary and would not substantially degrade the quality or use of a wildlife corridor or migratory route. Existing habitat linkages and wildlife corridor functions would remain intact during and after construction. Construction activities would not likely result in impacts to wildlife movement because the majority of the pipeline would be installed below grade and no new structures that would impede wildlife movement are proposed.

Construction activities associated with installation of new piping could result in short-term, temporary effects on smaller terrestrial wildlife movement. However, this impact would be temporary over a phased construction schedule, limited due to the narrow construction footprint within the existing ROW, and would not substantially degrade the quality or use of a wildlife corridor or migratory route. Existing habitat linkages and wildlife corridor functions would remain largely intact while construction activities are conducted and following completion. The Proposed Project would not construct any new structures that would impede wildlife movement and has been designed to avoid conducting work within any streams or drainages.

Following temporary construction disturbances, the function and values of the San Lorenzo River watershed and the surrounding Santa Cruz Mountains region would remain the same as existing conditions. Most of the pipeline alignment will be built within existing roads, disturbed ROW and easements. This small displacement of habitat would not impact wildlife movement or use of native wildlife nursery sites within the BSA and surrounding areas. The existing wildlife corridor functions within the Project area would remain intact during and post construction as the Proposed Project is functionally an in-kind replacement of an existing pipeline. The Proposed Project would generally follow the existing alignment, aside from the minor relocations in the Northern Segment and the relocation out of State Park lands and into Graham Hill Road in the Southern Segment, and would be almost

entirely buried underground. For these reasons, the Proposed Project would not directly impact wildlife movement, either during construction or upon project completion.

Indirect Impacts

There would be no long-term indirect impacts to wildlife movement as a result of the Proposed Project. Some short-term, indirect impacts to localized wildlife movement could occur due to construction-related noise and creek crossing construction. However, these impacts would be temporary and would not disrupt wildlife movement due to the limited construction activities around the creek, ambient noise conditions, and the ability for wildlife to continue to move through the creek, upland, and riparian portions of the BSA during and following construction activities. For these reasons, the Proposed Project would not indirectly impact wildlife movement.

Some short-term indirect impacts to localized wildlife movement could occur during construction due to construction-related noise. However, these impacts would be temporary and would not be expected to significantly disrupt wildlife movement during and following construction activities.

In summary, direct impacts to wildlife movement would be considered less than significant. No indirect impacts to wildlife movement are anticipated.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to wildlife corridors, and therefore, no mitigation measures are required.

4.3.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative biological resources impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analysis, and as relevant to this topic. The geographic area considered in the cumulative analysis for this topic is the San Lorenzo River watershed. The cumulative projects considered include other City Water Department planned capital improvement projects, construction/development projects proposed within the County, or improvement projects on nearby state facilities. Cumulative projects in the project vicinity would be those that would contribute to construction- or operations-related biological resources resulting from the Proposed Project.

The construction of the Proposed Project would occur over several phases, beginning in late 2022 and ending in 2031. As shown in Table 4.0-1, there are two cumulative projects that are located at or near the Project sites that could be under construction during this same period of time as the Proposed Project. Table 4.0-1 displays the estimated construction schedule for cumulative projects, where known. The only cumulative projects with an overlap of construction schedules are two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project). Other cumulative projects using roads within the Proposed Project construction areas would be completed before Proposed Project construction begins (Newell Creek Dam Inlet/Outlet Improvement Project north of the Newell Creek Road section and the County of Santa Cruz San Lorenzo Way Bridge Replacement east of the San Lorenzo Way section) or would occur after completion of the Graham Hill Road pipe sections (intertie with Scotts Valley, for which no project timeline has been established).

The Proposed Project would not contribute to cumulative impacts related to conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (Significance Threshold F) because it would have no impact related to this threshold, as described above. Therefore, this significance threshold is not further evaluated.

Impact BIO-5: Cumulative Biological Resources Impacts (Significance Thresholds A, B, C, D, and E). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to biological resources. ***(Less than Significant)***

The GHWTP Facility Improvement Project proposes to upgrade several components of the City's existing treatment plant. Several improvements and modification have been made over the years focusing on in-kind repairs and replacements, seismic upgrades, and minor improvements in response to changing regulations and permit requirements.. The Proposed Project, when considered cumulatively with the GHWTP Facility Improvement Project, would not result in significant cumulative impacts, as the construction periods for the two projects would not overlap and any adverse effects on listed Sandhills species from either project would be mitigated through implementation of the GHWTP LEHCP.

Other future projects within the City and County as noted above could result in impacts to biological resources. However, these projects would be subject to review and approval by the relevant jurisdiction on a case-by-case basis. Independent CEQA review would be required for all future projects with the potential to impact biological resources and mitigations would be incorporated into such projects to the extent feasible. Thus, it can be reasonably assumed that these projects would be designed or otherwise conditioned to avoid and minimize impacts to biological resources and would be required to comply with federal, state, and local regulations, policies and ordinances.

As described above, implementation of the Proposed Project would result in minor impacts to areas immediately surrounding the existing ROW. Post-construction, the Proposed Project would be operated and maintained similar to existing conditions. Mitigation measures have been identified to reduce potential impacts to special-status wildlife species, sensitive vegetation communities, and jurisdictional wetlands resulting from project implementation to less-than-significant levels, as described below in Section 6. Therefore, the Proposed Project, in combination with the reasonably foreseeable future projects in the watershed would result in less-than-significant impacts to biological resources, and no further mitigation measures are required.

4.3.4 References

Dudek. 2018. Biological Resources Assessment for the Newell Creek Dam Inlet/Outlet Replacement Project. October 2018.

Dudek. 2021. Biological Resources Assessment for the Newell Creek Pipeline Improvement Project. November 2021.

McGraw, J.M. 2021a. Sandhills Habitat Assessment for the Newell Creek Pipeline Replacement Project. April 2021.

McGraw, J.M. 2021b. Rare Plant Survey for the Newell Creek Pipeline Improvement Project: Brackney North, Graham Hill Road North, and Graham Hill Road South Pipeline Sections. August 2021.

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4.4 Cultural Resources and Tribal Cultural Resources

This section describes the existing conditions related to cultural and tribal cultural resources conditions of the Proposed Project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to implementation of the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on an Archaeological Resources Inventory and Evaluation Report (Dudek 2021a) and Historical Resources Inventory, Evaluation and Finding of Effect Report (Dudek 2021b) prepared for the Proposed Project; both reports are included in Appendix C.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. One comment letter related to cultural resources and tribal cultural resources was received from the Native American Heritage Commission (NAHC). The letter described the lead agency's responsibilities to evaluate tribal cultural resources under Assembly Bill (AB) 52 and Senate Bill (SB) 18 and provided recommendations for cultural resource assessment for the Proposed Project.

4.4.1 Definitions

Under the sample Initial Study Checklist found in Appendix G of the CEQA Guidelines, the term "cultural resources" encompasses both unique archaeological resources and historical architectural resources. More particularly, the category "cultural resources" focuses on two statutorily defined categories of resources: unique archaeological resources (see Public Resources Code Section 21083.2 and CEQA Guidelines Section 15064.5[c][3]) and "historical resources," which includes both structures and subsurface resources (see Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5[a], [c][1]). Pursuant to AB 52, enacted in 2014, CEQA also considers a project's potential impacts on tribal cultural resources. Cultural and tribal cultural resources are further defined as follows:

- Archaeological resources are objects or structures, often below ground, that relate to previous human use of an area. Archaeological resources are often distinguished by whether they are "prehistoric" or "historic." Prehistoric archaeological resources are connected to people who occupied the land prior to European settlement; historic archaeological resources are connected to the period of continuous European settlement forward. In much of California, this generally starts from the date of the Portolá expedition in the year 1769.
- Historic architectural resources are structures and buildings that may have historical associations with people or events of regional significance. Sometimes, historic architecture is also referred to as the "historic built environment." In Santa Cruz County, historic architectural resources are typically associated with the Spanish, Mexican, and American periods in California's history.
- Tribal cultural resources, defined in Section 21074(a) of the Public Resources Code, are sites, features, places, cultural landscapes, sacred places, or objects which are of cultural value to a California Native American tribe. Tribal cultural resources can sometimes also qualify as "unique archaeological resources" or "historical resources" (Public Resources Code Section 21074[c]).

These cultural resource definitions are further described in Section 4.4.3, Regulatory Framework.

4.4.2 Existing Conditions

Information in this section was obtained through cultural resource records searches, archival research, pedestrian surveys of the Proposed Project sites, historical significance evaluations, and correspondence with Native American tribes and other interested parties. The information is summarized below and described in detail in Appendix C.

4.4.2.1 Cultural Context

The following overview is summarized from the Archaeological Resources Inventory and Evaluation Report (Dudek 2021a) and Historical Resources Inventory, Evaluation and Finding of Effect Report (Dudek 2021b) prepared for the Proposed Project (see Appendix C) unless otherwise cited.

Prehistoric Context

Prior to European contact, the Project site was within the territory that was occupied by the Costanoan or Ohlone people. The term Costanoan refers to people who spoke eight separate Penutian-stock language groups and lived in autonomous tribelet communities between the vicinities of the City of Richmond in the north to Big Sur in the south. The prehistoric era of the greater Central California coast spans a period of approximately 10,000–12,000 years, and divides into six different periods. Researchers distinguish these periods based on perceived changes in prehistoric settlement patterns, subsistence practices, and technological advances. The Awaswas tribelet occupied the Santa Cruz area at the time of European contact.

Paleo-Indian Period (Pre-8000 BC)

The Paleo-Indian Period represents people's initial occupation of the Monterey Bay region, which was quite sparse across the region. The traditional interpretation of Paleo-Indian lifeways is that people were highly mobile hunters who focused subsistence efforts on large mammals. In contrast, the earliest inhabitants of the region focused their economic pursuits on coastal resources. Archaeological sites that support this hypothesis are mainly from the Santa Barbara Channel Islands. Some scholars hypothesize that Paleo-Indian sites in the Bay Area/northern Central Coast region may exist but have been inundated as a result of rising ocean levels throughout the Holocene.

Millingstone Period (8000 to 3500 BC)

Settlement in the Central Coast appeared with more frequency in the Millingstone Period. Sites are often associated with shellfish remains and small mammal bone, which suggest a collecting-focused economy and a diet composed of 70% to 84% marine resources. Contrary to these findings, deer remains are abundant at some Millingstone sites, which suggests a flexible subsistence focus. Similar to the Paleo-Indian Period, archaeologists generally view people living during the Millingstone Period as highly mobile.

Early Period (3500 to 600 BC)

The Early Period corresponds with the earliest era of the "Hunting Culture." Early Period sites are located in more varied environmental contexts than Millingstone sites, suggesting more intensive use of the landscape than practiced previously. Early Period sites are common and often found in estuary settings along the coast

or along river terraces inland and are present in both Monterey and Santa Cruz counties. Archaeologists have long debated whether the shift in site locations and artifact assemblages during this time represent either population intrusion as a result of mid-Holocene warming trends, or an in-situ adaptive shift. The initial use of mortars and pestles during this time appears to reflect a more labor- intensive economy associated with the adoption of acorn processing.

Middle Period (600 BC to AD 1000)

The trend toward greater labor investment is apparent in the Middle Period. During this time, there is increased use of plant resources, more long-term occupation at habitation sites, and a greater variety of smaller "use-specific" localities. The pattern reflects a greater emphasis on labor-intensive technologies that include projectile and plant processing. Additionally, faunal evidence highlights a shift toward prey species that are more labor intensive to capture, either by search and processing time or technological needs. These labor-intensive species include small schooling fishes, sea otters, rabbits, and plants such as acorn.

Middle-Late Transition (AD 1000 to 1250)

The Middle-Late Transition is a time that appears to correspond with social reorganization across the region. This era is also a period of rapid climatic change known as the Medieval Climatic Anomaly. The Medieval Climatic Anomaly is proposed as an impetus for the cultural change that was a response to fluctuations between cool-wet and warm-dry conditions that characterize the event. Archaeological sites are rarer during this period, which may reflect a decline in regional population.

Late Period (AD 1250-1769)

Late Period sites are found in a variety of environmental conditions and include newly occupied task sites and encampments, as well as previously occupied localities. Coastal sites dating to the Late Period tend to be resource acquisition or processing sites, while evidence for residential occupation is more common inland.

Historic Context

Spanish Period (1542 to 1822)

The first European to explore the Monterey Peninsula was Juan Rodríquez Cabrillo, a Portuguese explorer who was sent by the Viceroy of New Spain in 1542 to explore the Pacific coast north of Mexico. In 1602, Sebastián Vizcaíno was sent by the Spanish government to map the Californian coastline. It was Vizcaíno who named the area "Puerto de Monterey" after the viceroy of New Spain. The Gaspar de Portolá expedition traveled through the region in 1769 and returned again in 1770 to establish the Monterey Presidio, Spain's first military base in Alta California (the Spanish colonial state that included all of the modern U.S. states of California, Nevada and Utah, and parts of Arizona, Wyoming, Colorado and New Mexico. Mission Santa Cruz was established in 1791 as the twelfth mission in California. The Spanish missions drastically altered the lifeways of the Native Americans. Spanish missionaries conscripted members of local Native American communities to move to the Mission, where they were indoctrinated as Catholic neophytes. Villa de Branciforte, one of three Spanish civil settlements in California, was established near the Mission in 1797. The land taken by the Spanish was eventually repatriated to the Native tribes, but the massive decline in the population as a result of disease and

cultural disintegration meant that by the time the land was repatriated, few eligible recipients remained alive and in the area.

Mexican Period (1822 to 1848)

Mexico gained independence from Spain in 1821 and, in 1834, the Mexican government secularized the mission lands, releasing the Native Americans from control of the mission system. The City of Monterey continued as the capital of Alta California and the Californios, the Mexicans who settled in the region, were given land grants. These land grants covered over 150,000 acres of present-day Santa Cruz County.

American Period (1848 to Present)

The United States of America acquired Alta California in 1848 with the signing of the Treaty of Guadalupe Hidalgo, which ended the Mexican-American War. The California Gold Rush of 1849 led to an influx of people seeking gold in the rural counties of California. Entrepreneurs in Santa Cruz also saw the arrival of opportunity-seeking laborers to harvest natural resources found throughout the area. The lumber, fishing, lime, cement, and leisure industries formed the economic foundation of the County of Santa Cruz, while in the fertile acreage of central and south Santa Cruz County, agriculture took hold as the leading economic venture.

As the County moved into the 1900s, agriculture and tourism continued as the region's most prominent economic drivers. By the late 1950s, the population began to expand with aid from the establishment of Cabrillo College in 1959 and the University of California at Santa Cruz in the 1965. These higher education facilities brought both students and jobs as the schools became major sources of community employment throughout the County. During the 1980s, a number of technology companies settled in the area due to its proximity to Silicon Valley. Today, tourism, agriculture, manufacturing, and technology are the key industries that provide the economic base for County's residents

The Role of Water in the Early Development of Santa Cruz County

The Gold Rush accelerated the desirability of land across the state, and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling, or as-needed domestic use. When land in the Santa Cruz Mountains was subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in Santa Cruz County.

Many of these mountain streams and tributaries were utilized by early landowners and tenant entrepreneurs to make a profit from the natural resources that formed the early economic basis of the County. Several of these mountain creeks still bear the names of the first men who established mills or permanently settled beside them. Majors Creek was named for Joseph L. Majors who established a grist mill on the creek prior to serving as the County Treasurer between 1850 and 1853. Liddell Creek was named for George Liddell who

moved to the Santa Cruz Mountains and established a sawmill on the creek in 1851. Newell Creek was named for Addison Newell who established a farm in the steep, "v"-shaped valley on the banks of the creek in 1867.

For others, the streams presented pure economic opportunity. The first power sawmill in California was built on Rancho Zayante by Isaac Graham in the 1842 and was driven by the waters of Zayante Creek. Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased a portion of Rancho Cañada del Rincon in 1853 as a promising quarry site. They also utilized the falling water on the property to process local lumber into fuel for their many kilns. The California Powder Works was established in 1865 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The Powder Works used the river to grind raw materials used in the production of the first smokeless powder manufactured on the west coast of the United States. By 1868, there were a sizable number of business and industries that relied on water from County waterways to operate, including 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation within the County.

4.4.2.2 Development of Water Supply Systems in Santa Cruz County

City of Santa Cruz

As water management techniques were being applied to a variety of industries throughout the County, the successful technologies developed and used in early natural resource harvesting such as flumes and pumps prompted local residents in the City of Santa Cruz to consider why these were not being put to use for the benefit of drinking water. Beginning in the 1860s, acute cyclical water shortages and pollution prompted the development of several for- profit water systems in Santa Cruz. By the end of the 1880s, the two surviving major water companies, F.A. Hihn Water Works and the Santa Cruz Water Company, were joined into a single private business that competed with the new municipal water system that began in 1890 for almost three decades before being purchased by the City and integrated into the municipal system in 1916. The following section provides an outline of specific projects and key milestones related to the development of water management systems in the City of Santa Cruz.

F.A. Hihn Water Works (1864)

In 1864, Elihu Anthony and Fredrick A. Hihn implored the Board of County Supervisors to allow them to dig trenches and lay redwood pipes to transport water throughout Santa Cruz. The "wooden tubes" were chosen as an inexpensive alternative to iron pipes. The source of the water was an 8,000-gallon reservoir on Anthony's property supplied by water from Scott's Creek, and eager recipients of the water could gain access for a fee. The system became known as the F.A. Hihn Water Works, and it was the largest provider of water in the newly chartered city, with Dodero and Carbonero Creeks constituting its primary sources. The company predated the incorporation of Santa Cruz by 2 years.

The Santa Cruz Water Company (1866)

A man named E. Morgan acquired rights to the waters of the San Lorenzo River in 1866, just prior to the town of Santa Cruz being officially incorporated later that year. He used these rights to install a section of pipework conveying water to the area known then as the "The Flats," which comprises the modern area of Pacific Avenue and Front Street.

In 1876, Morgan sold his system to a wealthy man from San Francisco named H.K. Lowe. Under Lowe's guidance, the Santa Cruz Water Company incorporated in July 1876 and began construction on a pumping station on the San Lorenzo River approximately 1 mile upstream from the City, as well as a new reservoir located on High Street. By the end of 1876, the Company had also installed a diversion off Branciforte Creek to deliver water to a new reservoir located at the base of School Street. As the City continued to grow and the steam-powered pumping plant installed on the San Lorenzo River became the source of repeated water-quality concerns, the Santa Cruz Water Company acquired partial water appropriation rights to Majors Creek in 1881. For the next several years, the Santa Cruz Water Company focused its attention on the construction of a pipeline to divert water from the newly acquired Majors Creek appropriations. This effort was very costly and the company slipped into dire financial standing, eventually prompting the sale of the company in 1886.

City of Santa Cruz Water Department Development

During the 1880s, the rising price of these fee-based water systems like the F.A. Hihn Water Works and the Santa Cruz Water Company prompted the City to explore their own, city-owned, public water option. After several attempts to acquire an existing system of water works, the City revised its approach and began planning to build a diversion system and storage reservoir from the ground up, prompting the development of the first municipal water project in Santa Cruz, the Laguna Creek Dam and the Cowell Reservoir. This project led the way for other water system development in the City, including several other north coast stream diversions and the first pumping plant on the San Lorenzo River. In 1916, the City acquired the rights to the Santa Cruz Water Company and began to tie in the systems as one, forming the basis of the modern City system used today. Other components of the City's water system came soon after the 1890 completion of the Laguna Creek Dam, including the Reggiardo Creek Diversion and Dam (1891 and 1912), the High Street Distribution Reservoir (1904), Liddell Spring Diversion (1913), and the Crossing Street Pump Station (1913).

After the purchase of the Santa Cruz Water Company the City developed and improved many of the elements of its modern day system, including the Bay Street Reservoir (1924), Crossing Street Pumping Plant (now known as the Coast Pump Station) (1929), Tait Diversion (1961, reconfigured in 1983), Newell Creek Dam (1960, modified in 1985), Graham Hill Water Treatment Plant (1960, upgraded in 1987), Felton Diversion (1976), as well as other components of the system.

In 1936, the County granted Iowa native, Charles Lemar Beltz, the rights to begin operating a private water system in the area of the County roughly bounded by Capitola Road to the north, Rodeo Gulch and Corcoran's Lagoon to the west, the bay to the south, and 41st Avenue to the east. The service area of the Beltz system covered approximately 25% of the Live Oaks district with water sourced from ground wells located throughout the district and conveyed through pipelines situated beside Live Oak roads. By 1955, the Beltz Water Company system included six source wells that allowed the system to accommodate incremental growth from 900 customers in 1955 to approximately 1,500 customers by 1967. The City purchased the Beltz Water Company System in 1967 and also purchased the Pestana Water Company in 1961 that served the Santa Cruz Gardens subdivision and the Rolling Woods subdivision.

Newell Creek Dam Construction

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. The construction of the Newell Creek Dam and preparation

for the creation of Loch Lomond Reservoir began in 1960. The Newell Creek Dam was completed in 1961 and provides raw water storage for the City. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county.

Development of the Newell Creek Pipeline

Planning for the NCP began in conjunction with the development of the Newell Creek Dam and the Graham Hill Water Treatment Plant (GHWTP) following the approval of $5.5 million in water revenue bonds by Santa Cruz voters in November 1958. In October 1959, the City received a ROW agreement from the State of California for approximately 15,000 feet of the NCP to pass through the newly formed Henry Cowell Redwoods State Park south of Felton. Construction began in June 1960 and was completed later in 1960.

San Lorenzo Valley

By the late 1800s and early 1900s several small communities were scattered throughout the San Lorenzo Valley. These areas developed as a result of mining and lumber operations, the arrival of multiple railroads into the remote areas of the valley, and the increased popularity as a tourist destination for development of vacation homes. The remote nature of these small subdivisions caused them to rely on small, self-contained water systems. The communities of Ben Lomond, Brookdale, and Boulder Creek for example, formed their own, distinct water systems designed to serve the needs of residents who occupied their vacation homes only a few weeks a year which were supplied by nearby springs and creeks by way of flumes or pipelines. When the County population doubled between 1900 to 1940 from 21,512 to 45,057 persons and more people moved permanently into the valley, the existing water systems became inadequate.

Frequent droughts between 1912 and 1939 convinced San Lorenzo Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley Water Department (SLVWD) was formed by the voters on April 3, 1941. In 1959, the SLVWD signed an agreement with the City of Santa Cruz, in which the district sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam.

4.4.2.3 Archaeological Conditions of Proposed Project Sites

The following section summarizes archaeological resources and conditions in the Proposed Project's "area of potential effect" (APE) as contained in the Project archaeological report (see Appendix C). The results and findings are summarized below.

The APE includes those areas where project ground-disturbing activities would occur, including construction staging areas, along the entire NCP alignment. The width of the ground disturbance along the pipeline alignment varies between 10 to 120 feet (see Tables 3-2 and 3-3 in Section 3, Project Description). The vertical APE for the Proposed Project is generally between 5 and 15 feet below ground surface and is variable based on the diameter of the pipe

installed, ground conditions and presence of other utilities. However, the Brackney North section may be deeper at up to 50-100 feet below ground surface.

CHRIS Records Search

A cultural records search for the Proposed Project's APE and 0.25-mile buffer was conducted through the California Historical Resources Information System (CHRIS) at the Northwest Information Center (NWIC). The records search covered previously recorded resources and technical reports and reviewed the following:

- Archaeological and non-archaeological resource records and reports on file at NWIC
- Built Environment Resources Directory (BERD)
- OHP Archaeological Determinations of Eligibility
- California Inventory of Historical Resources (1976)
- Historical Maps

Previously Recorded Archaeological Resources

There have been 168 previous archaeological studies conducted within in the greater study area. Of those 168 reports, 22 have project areas that intersect the APE. The CHRIS records search revealed no previously recorded archaeological resources within the APE and 36 recorded resources within the study area buffer. Of the 36 known resources three are outside the APE, but within the buffer area (CA-SCR-78, CA-SCR-112/H, and CA-SCR-162), and are further reviewed below.

CA-SCR-78 (P-44-000083)

This resource is a bedrock mortar (BRM) milling station recorded by Lönnberg in 1972. The location is estimated to be approximately 250 feet east of the APE.

CA-SCR-112/H (P-27-000116)

This resource first recorded by Jean and Don Stafford in 1975 as a light scatter of chert lithic debris. Given the site location on a gentle slope above a small unnamed stream the recorders speculated that the location may have been an indigenous hunting station. Constituents noted from the site include a medial fragment of a Monterey chert biface tool, a few lithic debitage fragments and sparse marine shell. Historical debris including ceramic was also noted. A site record update (Cabrillo College ATP 2002) noted only two Monterey chert flakes and sparse historical debris including ceramic and window glass. The is estimated to be approximately 100 feet west of the APE.

CA-SCR-162 (P-27-000165)

Morris (1977a) recorded this site as a midden deposit with flake stone tools, cores, debitage and fire affected rock. Morris interpreted the materials as a temporary indigenous campsite for short-term or seasonal use. The location is estimated to be approximately 300 feet west of Graham Hill.

4.4.2.4 Historic Conditions of Proposed Project Sites

The following section summarizes historic resources and conditions in the Proposed Project's APE as contained in the Project historical resources report (see Appendix C). The results and findings are summarized below.

CHRIS Records Search

As indicated previously, a CHRIS cultural records search for the study area was conducted that includes the APE and a 0.25-mile buffer radius. The results of the survey were used to evaluate the site features for potential historical significance, based on the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), and the Santa Cruz County Historic Resources Inventory (SCCHRI) or City of Santa Cruz Historic Building Survey criteria, as relevant. See Section 4.4.3, Regulatory Framework, for information about these historic registers.

Recorded and Known Historical Resources in Vicinity of Proposed Project sites

The records search results included 168 previously conducted studies within the study area. Of those 168 reports, 22 have project areas that intersect the Proposed Project APE. The records search revealed 34 previously recorded cultural resources within the record search study area. Five previously recorded cultural resources (all built environment resources) intersect the APE, and 29 recorded resources are located within the study area buffer outside the APE. The five resources located within the APE have been previously found ineligible, so there is no potential for adverse effect.

Recorded historical resources within the 0.25-mile APE buffer area are summarized in Table 4.4-1. Three previously recorded cultural resources (all built environment resources) have been identified as being eligible or potentially eligible for listing on the NRHP and/or CRHR.

Table 4.4-1. Previously Recorded Cultural Resources Within the Records Search Area

Primary Number	Trinomial	Resource Name/ Description	Age	Year (Recorded By)	NRHP/CRHR Eligibility Status	Proximity to APE
Resources within the 0.25-mile Record Search Buffer						
P-44-000209	CA-SCR-000207H	Felton Covered Bridge/ Structure	Historic	1975 (Jean & Don Stafford); 1984 (Basin Research); 2002 (Foley, Connolly, Gorham, Bowen, Peebles, Edwards, Cabrillo College Archaeological Technology Program)	1S	Outside
P-44-000210	CA-SCR-000208H	Felton Presbyterian Church/Building	Historic	1977 (Mrs. Edith E. Fikes, Faye G. Belardi Board of Trustees);	1S	Outside
P-44-000971	—	Southern Pacific Depot/Building	Historic	1988 (Edna F. Kimbro, Historical Architectural Research); 2001 (Brett Rushing, ENTRIX Inc.)	5S2	Outside

Status Codes: (1S) Individual Property listed in the NRHP by the Keeper; (5S2) Individual property that is eligible for local listing or designation; (6) Not eligible for listing; (6Y) Determined ineligible for NRHP by consensus through Section 106 process – Not evaluated for CRHR or Local Listing; (6Z) Found ineligible for NRHP, CRHR, or Local designation through survey evaluation; and (7N) Needs to be reevaluated.

The San Lorenzo River Bridge (36C0085) is located east of the intersection of Highway 9 and Clearview Place, and it briefly transects the APE north of Felton. This local agency bridge was completed in 1920 and is included in the Caltrans Historic Bridge Survey with a NRHP historical significance status designation of 2, Eligible for National Register listing. The bridge on Graham Hill Road over Zayante Creek (referenced as Bean Creek Bridge [36C0141]) is located on Graham Hill Road just south of the intersection with East Zayante Road within the Project APE. This local bridge was completed in 1936 and is included in the Caltrans Historic Bridge Survey with a NRHP historical significance status designation of 5, Ineligible for National Register listing.

Other resources over the age of 45 years of age are located in the APE but would not be affected by Project construction or implementation. A section of the Santa Cruz and Felton Railroad is present within the APE where it briefly transects the planned path of the pipeline. Several roads also run parallel with or briefly transect the Project APE, including Graham Hill Road, Mt. Hermon Road, Glen Arbor Road, numerous small county roads, as well as several private and local agency bridges. These structures are not associated with the NCP as they maintain distinct development histories, and the Proposed Project does not include any actions related to the realignment or replacement of these structures.

Proposed Project Sites

The existing NCP is 9.25 miles long and located in the unincorporated areas of Santa Cruz County. As previously described, construction was completed in 1960 as part of the construction of the Newell Creek Dam. The segments of the NCP directly north of Felton were planned along a section of the former Felton and Pescadero Railroad bed that was decommissioned in 1934. This section of the former railroad path heads northwest from Henry Cowell Redwoods State Park where the tracks met the former Santa Cruz and Felton Railroad tracks, beneath Zayante Creek, and diagonally across Graham Hill Road and Mt. Hermon Road to the beginning of San Lorenzo Way from whence the NCP traveled northwest. This section of road includes multiple culverts which dated to the construction of the railroad in 1885.

The exiting NCP was evaluated for listing in the NRHP, the CRHR, or the SCCHRI and was found ineligible under all criteria. As such, the NCP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA.

The Newell Creek Access Road Bridge is a concrete access bridge dating from 1960. It is located at the northernmost end of the existing NCP and Proposed Project. The bridge was found eligible for the NRHP and the CRHR as a contributor to the Newell Creek Dam Complex under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2. The character defining features of the bridge are limited to its existing dimensions and its continued use as a contributing component of the Newell Creek Dam Complex. As such, the Newell Creek Access Road Bridge is considered historic property under Section 106 of the NHPA and historical resource under CEQA.

4.4.2.5 Tribal Cultural Resources

To date, the City has not been contacted by Native American tribes requesting notification of projects for the purpose of consultation of tribal cultural resources pursuant to AB 52, with the exception of an individual request for consultation for a specific project. See Section 4.4.3, Regulatory Framework, for information about AB 52 requirements.

A request to the NAHC for a search of the Sacred Lands File (SLF), a list of properties important to local Native American tribes, for the Proposed Project APE. On January 27, 2021, a letter was received from the NAHC with negative findings from the SLF search. The NAHC also provided a list of Native American contacts that might have local knowledge of archaeological or tribal cultural resources near the Proposed Project.

To access additional information from local tribes, on behalf of the City, Dudek sent letters to the Native American contacts provided by the NAHC. On February 3, 2021, Valentine Lopez, Chairman of the Amah Mutsun Tribal Band, sent an email to Dudek indicating that he had no comment on the Proposed Project, but would like to request a Native American monitor from his tribe be present if cultural resources are encountered. On February 10, 2021, Mike Grone, Director of Archaeological Resource Management for Amah Mutsun Land Trust, requested an introduction to the Proposed Project and information on additional resources in the APE. Dudek provided the requested information, and Mr. Grone sent a second correspondence on February 15, 2021 indicating that Amah Mutsun Land Trust had no further comments. A complete record of the NAHC SLF search and Native American outreach effort is included in the archaeological report in Appendix C.

4.4.3 Regulatory Framework

4.4.3.1 Federal

National Historic Preservation Act

The NHPA established the NRHP and the President's Advisory Council on Historic Preservation (ACHP), and provided that states may establish State Historic Preservation Officers to carry out some of the functions of the NHPA. Most significantly for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that:

> [t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP.

Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

36 CFR Part 800 implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historic significance in consultation with the ACHP and the California State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
B. Are associated with the lives of persons significant in our past; or
C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. Have yielded, or may be likely to yield, information important in prehistory or history.

The 1992 amendments to the NHPA enhance the recognition of tribal governments' roles in the national historic preservation program, including adding a member of an Indian tribe or Native Hawaiian organization to the ACHP.

The NHPA amendments:

- Clarify that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register
- Reinforce the provisions of the Council's regulations that require the federal agency to consult on properties of religious and cultural importance.

The 1992 amendments also specify that the ACHP can enter into agreement with tribes that permit undertakings on tribal land and that are reviewed under tribal regulations governing Section 106. Regulations implementing the NHPA state that a federal agency must consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

4.4.3.2 State

California Register of Historical Resources

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (Public Resources Code Section 5020.1[j]; see also CEQA Guidelines Section 15064.5[a]). In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (Public Resources Code Section 5024.1[a]). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP including associated historic integrity considerations and are enumerated below. According to Public Resources Code Section 5024.1(c)(1–4), a resource is considered historically significant meets at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 California Code of Regulations [CCR] Section 4852[d][2]).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- Public Resources Code Section 21083.2(g) defines "unique archaeological resource."
- Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would "materially impair" the significance of an historical resource (an element of a "substantial adverse change" to the resource) (see discussion below).
- Public Resources Code Section 21074(a) defines "tribal cultural resources."
- Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- Public Resources Code Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4(b) provide information regarding the mitigation framework for archaeological and historical resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to both unique archaeological resources and "historical resources of an archaeological nature" because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

Historical Resources

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (Public Resources Code Section

21084.1; CEQA Guidelines Section 15064.5[b]). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources or identified as significant in a historical resources survey (meeting the requirements of Public Resources Code Section 5024.1[q]), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (Public Resources Code Section 21084.1; CEQA Guidelines Section 15064.5[a]). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (Public Resources Code Section 21084.1; CEQA Guidelines Section 15064.5[a]).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); Public Resources Code Section 5020.1[q]). In turn, CEQA Guidelines Section 15064.5(b)(2) states the significance of an historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

Where a project has been determined to conform with the Secretary of the Interior's Standards, the project's impact on historical resources would be considered mitigated to below a level of significance and, thus, not significant (14 CCR Section 15126.4[b][1]). In most cases, a project that demonstrates conformance with the Secretary of the Interior's Standards is categorically exempt from CEQA (14 CCR Section 15331), as described in the CEQA Guidelines:

> Where maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of the historical resource will be conducted in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Weeks and Grimmer 1995), the project's impact on the historical resource shall generally be considered mitigated below a level of significance and thus is not significant (14 CCR Section 15126.4[b][1]).

The Secretary of the Interior's Standards are a series of concepts focused on maintaining, repairing, and replacing historic materials, as well as designing new additions or making alterations. They function as common-sense historic preservation principles that promote historic preservation best practices. There are four distinct approaches that may be applied to the treatment of historical resources:

- **Preservation** focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time.
- **Rehabilitation** acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character.
- **Restoration** depicts a property at a particular period of time in its history, while removing evidence of other periods.
- **Reconstruction** recreates vanished or non-surviving portions of a property for interpretive purposes.

The choice of treatment depends on a variety of factors, including the property's historical significance, physical condition, proposed use, and intended interpretation. The Guidelines provide general design and technical recommendations to assist in applying the Standards to a specific property. Together, the Standards and Guidelines provide a framework that guides important decisions concerning proposed changes to a historic property.

Unique Archaeological Resources

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (Public Resources Code Section 21083.2[a], [b], and [c]).

Public Resources Code Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (Public Resources Code Section 21083.2[a]; CEQA Guidelines Section 15064.5[c][4]). However, if a non-unique archaeological resource qualifies as tribal cultural resource (Public Resources Code Section 21074[c], 21083.2[h]), further consideration of significant impacts is required. CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in Public Resources Code Section 5097.98.

California Environmental Quality Act Assembly Bill 52 Consultation

State AB 52, effective July 1, 2015, recognizes that California Native American prehistoric, historic, archaeological, cultural, and sacred places are essential elements in tribal cultural traditions, heritages, and identities. The law establishes a separate category of resources in the CEQA called "tribal cultural resources" that considers the tribal cultural values in addition to the scientific and archaeological values when determining impacts and mitigation. Public Resources Code Section 21074 defines a "tribal cultural resource" as either:

- Sites, features, places, cultural landscapes, sacred places and objects with cultural value to a California Nature American tribe that is either listed, or determined to be eligible for listing, on the national, state, or local register of historic resources; or
- A resource determined by the lead agency chooses, in its discretion and supported by substantial evidence, to treat as a tribal cultural resource.

The California Public Resources Code Section 21084.2 now establishes that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment." The Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project.

The CEQA lead agency for consultation with local Native American tribes is the City of Santa Cruz. As previously indicated, at the time of preparation of this Draft EIR, the City has not received any AB 52 requests from local tribes that apply to all projects. The agency regulatory contact for the consultation is Danny DeBrito, Santa Cruz Water Department, 212 Locust Street, Suite C, Santa Cruz, CA 95060, (831) 420-5135, ddebrio@cityofsantacruz.com.

California Health and Safety Code

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the County Coroner has examined the remains (California Health and Safety Code Section 7050.5b). Public Resources Code Section 5097.98 outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the Native American Heritage Commission (NAHC) within 24 hours (California Health and Safety Code Section 7050.5c). The NAHC would notify the most likely descendant (MLD). With the permission of the landowner, the MLD may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the MLD by the NAHC. The MLD may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

4.4.3.3 Local

The study area for the Proposed Project includes the unincorporated County of Santa Cruz and the City of Santa Cruz where the Graham Hill Water Treatment Plant (GHWTP) is located. The general plans and, where relevant, the local coastal programs of these jurisdictions include policies and programs related to cultural resources. Specific details are provided in this section about the County and City codes related to the historic inventories of these jurisdictions, as this information was used in the evaluation of the Proposed Project.

Santa Cruz County Code

Historic Resources Inventory

Cultural Landmarks in the County of Santa Cruz are termed Historic Resources and are under the aegis of the County of Santa Cruz Planning Department. A list of Historic Resources is maintained in the County's Historic Resources Inventory, which identifies those Historic Resources located in the unincorporated areas of the County. Historic Resource is defined in Chapter 16:42 Historic Preservation within Title 16: Environmental and Resource Protection as follows (County Code 16.42.030 (I) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008]):

> … any structure, object, site, property, or district which has a special historical, archaeological, cultural or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the County, State, or nation, and which either has been referenced in the County General Plan, or has been listed in the historic resources inventory adopted pursuant to SCCC 16.42.050 and has a rating of significance of NR-1, NR-2, NR-3, NR-4, or NR-5.

In order to be placed on the County Historic Resources Inventory, a property must first be evaluated for its ability to meet one or more of the following criteria: (County Code 16.42.050 Historic Resource Designation [Ord. 4922 § 1, 2008]).

1. The resource is associated with a person of local, state or national historical significance.
2. The resource is associated with an historic event or thematic activity of local, State or national importance.
3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.
4. The resource has yielded, or may likely yield, information important to history.

Santa Cruz County Historic Districts

The County of Santa Cruz defines Historic District as (County Code 16.42.030 (E) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008]):

1. Have character of special historic or aesthetic interest or value; and
2. Represent one or more periods or styles of architecture typical of one or more eras in the history of the County; and

3. Cause such area, by reason of these factors, to constitute a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects that are unified by past events, or aesthetically by plan or physical development.

City of Santa Cruz Municipal Code

Historic District

Chapter 24.06, Part 2 Historic District Designation, provides procedures for the designation of a historic district. The criteria of a designated historic district include:

1. The proposed historic district is a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects unified by past events, or aesthetically by plan or physical development.
2. The collective value of the historic district taken together may be greater than the value of each individual structure.
3. The proposed designation is in conformance with the purpose of the City's historic preservation provisions, set forth in Section 24.12.400 of this title and the City's Historic Preservation Plan and the General Plan.

Historic Preservation

Chapter 24.12, Part 5 (Historic Preservation) of the City of Santa Cruz Municipal Code outlines methods and regulations for the protection, enhancement, perpetuation and use of structures, districts, lands, and neighborhoods of historic, archaeological, architectural, and engineering significance. The purpose of provisions in this chapter related to historic preservation is to:

1. Designate, preserve, protect, enhance, and perpetuate those historic structures, districts, and neighborhoods contributing to cultural and aesthetic benefit of Santa Cruz;
2. Foster civic pride in the beauty and accomplishments of the past;
3. Stabilize and improve the economic value of certain historic structures, districts, and neighborhoods;
4. Protect and enhance the city's cultural, archaeological and aesthetic heritage;
5. Promote and encourage continued private ownership and use of such buildings and other structures now so owned and used, to the extent that the objectives listed above can be obtained under such policy;
6. Serve as part of the Local Coastal Implementation Plan for the Coastal Program.

4.4.4 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to cultural resources and tribal cultural resources. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation

measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.4.4.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to cultural resources and tribal cultural resources are based on statutory language found in Public Resources Code Sections 21083.2(a), 21084.1, 21084.2, CEQA Guidelines Section 15064.5(b), Appendix G of the CEQA Guidelines, and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
B. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5.
C. Disturb any human remains, including those interred outside of formal cemeteries.
D. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074.

4.4.4.2 Analytical Methods

This section evaluates the potential cultural resources and tribal cultural resources impacts associated with construction of the Proposed Project. Once construction is complete, operation and maintenance will occur as currently exists, and there would be no operational activities that would potentially affect cultural resources as there would be no ground disturbance or alteration of structures.

Records Search and Native American Coordination

As described above, a CHRIS records search and a NAHC Sacred Lands File search were conducted for the Proposed Project in April 2020. The CHRIS search included a review of the NRHP, CRHR, California Inventory of Historic Resources, historical maps, and local inventories. Additionally, Native American tribes and tribal organizations were contacted in response to NAHC recommendations for making contact when the Sacred Lands File search was completed by NAHC.

Surveys

Pedestrian surveys of the APE occurred December 2, 9, and 16, 2020. An archaeological reconnaissance was conducted by a qualified archaeologist using standard archaeological procedures and techniques. All field practices met the Secretary of Interior's standards and guidelines for a cultural resources inventory. The land area was surveyed in pedestrian transects with approximately 15- to 20-meter spacing. A qualified architectural historian also conducted a pedestrian survey of the study area. The survey entailed walking all accessible portions of the study area and documenting the site with notes and photographs, specifically noting character-defining features, spatial relationships, and observed alterations, and examining any historic landscape features on the property. See Appendix C for further details on survey methods.

Historical Resources

Projects can result in a substantial adverse change in the significance of a historical resource if they would cause physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (CEQA Guidelines Section 15064.5). According to Appendix C, two historic era-built environment resources were identified in the APE: the NCP and the Newell Creek Access Road Bridge.

Archaeological Resources

Archaeological sites are usually adversely affected only by physical destruction or damage that can be caused by grading and excavation, trenching, weather-induced erosion, etc. Impacts to archaeological resources and human remains most often occur as the result of excavation or grading within the vertical or horizontal boundaries of a significant archaeological site. Archaeological resources may also suffer impacts as the result of project activity that increases erosion, or increases the accessibility of a surface resource, and thus increases the potential for vandalism or illicit collection. Because archaeological resources often are buried or cannot be fully defined or assessed on the basis of surface manifestations, substantial ground-disturbing work may have the potential to uncover previously unidentified resources, including archaeological deposits and human remains. As precise fill depths may not be known in all cases, it must be assumed that any ground-disturbing activities in any portion of the study area where development will occur could potentially affect unique archaeological resources, historical resources of an archaeological nature, or subsurface tribal cultural resources.

Application of Relevant Standard Construction Practices

The Proposed Project includes standard construction practices (see Section 3.6.6, Standard Construction Practices), that the City would implement to avoid or minimize effects to archaeological resources and human remains. These practices and their effectiveness in avoiding and minimizing effects are described below.

If archaeological resources (sites, features, or artifacts) are exposed during construction, Standard Construction Practice #24 requires construction activities to stop within a 100 feet radius of any finds, temporary flagging around the resources, and evaluation of the significance of the finds by a qualified archaeologist. If the archaeologist observes the discovery to be potentially significant under CEQA, preservation in place or additional treatment may be required. This practice requires work stoppage to evaluate the significance of a potential archaeological resource and defers to the judgement of a qualified archaeologist as to the appropriate treatment of such a significant resource, if found, and sets forth procedures to be followed. The archaeologist may record the find to appropriate standards (thereby addressing any data potential) and allow work to continue.

If human remains are exposed during construction, Standard Construction Practice #25 requires the implementation of State and Federal laws that protect Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. The legal requirements are contained in Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Section 106 of the National Historic Preservation Act (see Section 4.4.3.2, State, for details). These laws are effective in that they require construction work to stop, notification of the lead agency staff and County Coroner, notification of the NAHC

and the MLD, and the appropriate treatment of the remains. The MLD may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.4.4.3 Project Impact Analysis

Impact CUL-1: Historical (Built Environment Resources) (Significance Threshold A). Construction of the Proposed Project would not result in a substantial adverse change in the significance of historical built environment resource. ***(Less than Significant)***

The Proposed Project would result in excavation and ground disturbance to install the new pipeline. Upon completion of construction and once the Proposed Project is operational, the existing NCP would be dewatered and filled with grout as part of decommissioning the existing pipe. The existing NCP was found ineligible under all NRHP and CRHR criteria. As such, the existing NCP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA, and thus, decommissioning would not result in adverse impacts to a historical resource.

The Newell Creek Access Road Bridge is a concrete access bridge dating from 1960 that is located at the northern end of the Proposed Project in the Newell Creek Road pipe section. The bridge was found eligible for listing in the NRHP and the CRHR as a contributor to the Newell Creek Dam Complex under NRHP/CRHR Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2. The character defining features of the bridge are limited to its existing dimensions and its continued use as a contributing component of the Newell Creek Dam Complex. As such, the Newell Creek Access Road Bridge is considered a historic property under Section 106 of the NHPA and a historical resource under CEQA.

The Proposed Project would replace a segment of the existing NCP attached to this bridge. This activity does not pose an adverse effect to the historic resource. The Project would not demolish, destroy, or relocate the Newell Creek Access Road Bridge. Replacement of the existing NCP with a new pipeline would not diminish the integrity of the Newell Creek Access Road Bridge's significant historic features including its original alignment and configuration. The bridge would continue to serve its intended function, such that the bridge would continue to convey its significance as defined by NRHP Criterion A and CRHR 1. The modifications to the bridge would not introduce any new incompatible elements that would diminish the integrity of the bridge. Project alterations would not alter the association between the Newell Creek Access Road Bridge and events and broad patterns of water system infrastructure and water supply planning in the City and county for which the bridge has been determined eligible for listing as a historical resource in the NRHP, CRHR, and local County register. Therefore, the proposed improvements would not adversely impact the physical characteristics that convey the historical significance of the Newell Creek Access Road Bridge as none of the improvements would alter the overall historic integrity of the resource. For the reasons described above, the Proposed Project would result in a less-than-significant impact on historical resources.

The San Lorenzo River Bridge (36C0085) has been previously determined eligible for listing in the NRHP. This facility is located west of the Proposed Project's San Lorenzo Way pipe section. However, the Proposed Project does not include any actions related to the bridge. It will be left in place and is not part of any Proposed Project related construction or implementation activities. As such there is no potential for the bridge to be adversely affected/impacted by the Proposed Project.

Therefore, construction of the Proposed Project would not result in a substantial adverse change in the significance of a historical resource. Upon completion of construction, operation and maintenance activities would continue as currently exist, and there would be no ground disturbance or alteration of structures, and thus, no impact to historical resources.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to historical resources, and therefore, no mitigation measures are required.

Impact CUL-2: Archaeological Resources and Human Remains (Significance Thresholds B and C). Construction of the Proposed Project would not cause a substantial adverse change in the significance of unique archaeological resources or historical resources of an archaeological nature, and/or disturb human remains. ***(Less than Significant)***

No archaeological resources were identified within the APE during the CHRIS records search, Native American coordination, or archaeological field survey. Three known resources (CA-SCR-78, CA-SCR-112/H, and CA-SCR-162) previously recorded in proximity to the APE were reviewed and assessed in the Project Archaeological Report, Appendix C. The report concluded that due to the location and characteristics of these resources (I.e., areas of previous disturbances and very low artifact density), they are not likely to be impacted by the Proposed Project. Therefore, construction of the Proposed Project would not result in adverse impacts to archaeological resources and human remains, and operation and maintenance activities would be the same as currently exists. However, there is potential for previously unknown, subsurface archaeological deposits and/or human remains to be uncovered during earth disturbing activities. The City's Standard Construction Practice 24 regarding inadvertent discovery of archaeological deposits and Standard Construction Practice 25 regarding inadvertent discovery of human remains identifies measures to be taken to assess a discovery and implement measures, if needed, to avoid or reduce impacts if the resource is determined to be a historical or unique archaeological resource. Therefore, with implementation of the Proposed Project's Standard Construction Practices, impacts to any unknown archaeological resources and human remains identified during construction would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to unique archaeological resources or historical resources of an archaeological nature, and therefore, no mitigation measures are required.

Impact CUL-3: Tribal Cultural Resources (Significance Threshold D). Construction of the Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource. ***(Less than Significant)***

The NAHC SLF search did not identify any known tribal cultural resources that intersect the APE, as confirmed by letter from the NAHC on January 27, 2021. To access additional information from local tribes, letters were sent to Native American contacts provided by the NAHC. Valentine Lopez, Chairman of the Amah Mutsun Tribal Band, sent an email indicating that he had no comment on the Proposed Project, but would like to request a Native American monitor from his tribe be present if cultural resources are encountered. However, the correspondence did not provide information regarding potential presence of tribal cultural resources.

The Proposed Project would not impact known archaeological sites, and no tribal cultural resources meeting the definition in the Public Resources Code have been identified. The CHRIS records search, Native American coordination, and field survey did not identify any archaeological resources within the Project sites or any specific cultural resource sensitivity concerns. There are no known resources that intersect the APE that would be considered tribal cultural resources. Furthermore, in the event that unknown, archaeological sites or tribal cultural resources are uncovered during the course of construction Standard Construction Practices #24 and #25 would be implemented, as described above in Impact CUL-2. Therefore, construction and operation of the Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to tribal cultural resources, and therefore, no mitigation measures are required.

4.4.4.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative cultural resources and tribal cultural resources impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic. The geographic area of analysis for cumulative impacts to cultural resources and tribal cultural resources is the County of Santa Cruz.

Impact CUL-4: Cumulative Cultural Resource and Tribal Cultural Resource Impacts (Significance Thresholds A, B, C, and D). Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to cultural resources and tribal cultural resources. ***(Less than Significant)***

As shown in Table 4.0-1, there are numerous cumulative projects that would be located in Santa Cruz County. Some of these cumulative projects would be approved and implemented by the City and some would require discretionary approval from other local agencies in the County. The context for the cultural resources and tribal cultural resources cumulative analysis considers the former territory of the Costanoan or Ohlone people and the historic-era settlement patterns that have occurred over roughly the past two centuries. As there are a limited number of significant cultural resources, the loss of any one cultural resource site could affect the scientific value of others in a region. Implementation of appropriate mitigation measures that are identified

during the discretionary approval process for cumulative projects can help to capture and preserve knowledge of such resources through a range of typical actions (e.g., preservation in place, data recovery, conformance with the Secretary of the Interior's Standards) and federal, state, and local laws can also protect these resources. However, preservation in place is not always feasible, and therefore cumulative projects could result in a potentially significant cumulative impact on cultural resources and tribal cultural resources.

The geographic scope for cumulative impact analysis on cultural resources includes all sites upon which past, present or future activities could affect the same cultural resources as the Proposed Project. As described in the preceding section, construction of the Proposed Project would not result significant impacts related to historic built environment resources (Impact CUL-1), historic or unique archaeological resources (Impact CUL-2) or tribal cultural resources (CUL-3). The proposed Project would not contribute to cumulative impacts related to cultural resources as no cumulative projects have been identified to which the proposed Project would contribute impacts.

4.4.5 References

Dudek. 2021a. Archaeological Resources Inventory and Evaluation Report for the Newell Creek Pipeline Improvement Project. April 2021.

Dudek. 2021b. Historical Resources Inventory, Evaluation and Finding of Effect Report for the Newell Creek Pipeline Improvement Project. June 2021.

4.5 Energy

This section describes the existing energy conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to implementation of the of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project).

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to energy.

4.5.1 Existing Conditions

4.5.1.1 Electricity and Natural Gas

Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to the region. Incorporated in California in 1905, PG&E is one of the largest combination natural gas and electric utilities in the United States. It currently provides service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. The service area includes 106,681 circuit miles of electric distribution lines, 18,466 circuit miles of interconnected transmission lines. 42,141 miles of natural gas distribution pipelines and 6,438 miles of transportation pipelines. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (CPUC) (PG&E 2020).

Monterey Bay Community Power (MBCP), which recently underwent a name change to Central Coast Community Energy (3CE), was formed in March 2017 as a joint powers authority to provide locally controlled, clean and renewable electricity to residents and businesses in Monterey, San Benito, and Santa Cruz Counties, as well as parts of Santa Barbara and San Luis Obispo Counties through the Community Choice Energy (CCE) model established by the State of California. The CCE model enables communities to choose clean-source power at a cost equivalent to PG&E while retaining PG&E's role in maintaining power lines and providing customer service. The CCE model helps ensure local economic vitality because surplus revenues that would normally flow to PG&E will stay in the community. 3CE started serving electricity to customers beginning spring 2018, with current PG&E customers automatically switched over (3CE 2021). Notably, the City purchases electricity from MBCP for its municipal facility operations.

According to the U.S. Energy Information Administration (EIA), California used approximately 255,224 gigawatt hours of electricity in 2018 (U.S. EIA 2020a). Electricity usage in California for different land uses varies substantially by the types of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building. Due to the state's energy efficiency building standards and efficiency and conservation programs, California's electricity use per capita in the residential sector is lower than any other state except Hawaii (U.S. EIA 2020b).

In Santa Cruz County, PG&E reported an annual electrical consumption of approximately 1,212 million kilowatt hours (kWh) in 2018, with 667 million kWh for non-residential use and 546 million kWh for residential use (California Energy Commission [CED] 2020a).

According to the EIA, California used approximately 2,136,907 million cubic feet of natural gas in 2018 (U.S. EIA 2020c). The majority of California's natural gas customers are residential and small commercial customers (core customers). These customers account for approximately 35% of the natural gas delivered by California utilities (CPUC 2020). Large consumers, such as electric generators and industrial customers (noncore customers), account for approximately 65% of the natural gas delivered by California utilities (CPUC 2020). CPUC regulates California natural gas rates and natural gas services, including in-state transportation over transmission and distribution pipeline systems, storage, procurement, metering, and billing. Most of the natural gas used in California comes from out-of-state natural gas basins. Biogas (e.g. from wastewater treatment facilities or dairy farms) is just beginning to be delivered into the gas utility pipeline systems, and the State has been encouraging its development (CPUC 2020).

In 2018, PG&E had delivered approximately 52 million therms to Santa Cruz County, with 21 million therms for non-residential use and 31 million therms for residential use (CEC 2020b).

4.5.1.2 Transportation-Related Energy Consumption

According to the EIA, California used approximately 681 million barrels of petroleum in 2018, with the majority (584 million barrels) used for the transportation sector (U.S. EIA 2020d). This total annual consumption equates to a daily use of approximately 1.9 million barrels of petroleum. There are 42 U.S. gallons in a barrel, so California consumes approximately 78.4 million gallons of petroleum per day, adding up to an annual consumption of 28.6 billion gallons of petroleum. In California, petroleum fuels refined from crude oil are the dominant source of energy for transportation sources. Petroleum usage in California includes petroleum products such as motor gasoline, distillate fuel, liquefied petroleum gases, and jet fuel. California has implemented policies to improve vehicle efficiency and to support use of alternative transportation, which are described in Section 4.5.2, Regulatory Framework, below.

4.5.2 Regulatory Framework

4.5.2.1 Federal

Federal Energy Policy and Conservation Act

In 1975, Congress enacted the Federal Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 FR 62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 promoted the development of intermodal transportation systems to maximize mobility and address national and local interests in air quality and energy. ISTEA contained factors for metropolitan planning organizations to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, metropolitan

planning organizations adopted policies defining the social, economic, energy, and environmental values guiding transportation decisions.

Energy Independence and Security Act

On December 19, 2007, the Energy Independence and Security Act (EISA) of 2007 was signed into law. In addition to setting increased Corporate Average Fuel Economy standards for motor vehicles, the EISA includes the following other provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

This federal legislation requires ever-increasing levels of renewable fuels to replace petroleum (U.S. Environmental Protection Agency [EPA] 2017). The EPA is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

The RFS program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the EISA, the RFS program was expanded in several key ways that lay the foundation for achieving significant reductions in greenhouse gas (GHG) emissions from the use of renewable fuels, reducing imported petroleum, and encouraging the development and expansion of the renewable fuels sector in the United States. The updated program is referred to as RFS2 and includes the following:

- EISA expanded the RFS program to include diesel in addition to gasoline.
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.
- EISA established new categories of renewable fuel and set separate volume requirements for each one.
- EISA required the EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green" jobs.

4.5.2.2 State

Warren-Alquist Act

The California legislature passed the Warren-Alquist Act in 1974. The Warren-Alquist Act created the California Energy Commission (CEC). The legislation also incorporated the following three key provisions designed to address the demand side of the energy equation:

- It directed the CEC to formulate and adopt the nation's first energy conservation standards for buildings constructed and appliances sold in California.
- The act removed the responsibility of electricity demand forecasting from the utilities, which had a financial interest in high-demand projections, and transferred it to a more impartial CEC.
- The CEC was directed to embark on an ambitious research and development program, with a particular focus on fostering what were characterized as non-conventional energy sources.

State of California Energy Action Plan

The CEC and CPUC approved the first State of California Energy Action Plan in 2003. The plan established shared goals and specific actions to ensure that adequate, reliable, and reasonably priced electrical power and natural gas supplies are provided, and identified policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers. In 2005, a second Energy Action Plan was adopted by the CEC and CPUC to reflect various policy changes and actions of the prior 2 years.

At the beginning of 2008, the CEC and CPUC determined that it was not necessary or productive to prepare a new energy action plan. This determination was based, in part, on a finding that the state's energy policies have been significantly influenced by the passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 (discussed below). Rather than produce a new energy action plan, the CEC and CPUC prepared an update that examines the state's ongoing actions in the context of global climate change.

Senate Bills 1078 (2002), 107 (2006), X1-2 (2011), 350 (2015) and 100 (2018)

Senate Bill (SB) 1078 established the California RPS Program and required that a retail seller of electricity purchase a specified minimum percentage of electricity generated by eligible renewable energy resources as defined in any given year, culminating in a 20% standard by December 31, 2017. These retail sellers include electrical corporations, community choice aggregators, and electric service providers. The bill relatedly required the CEC to certify eligible renewable energy resources, design and implement an accounting system to verify compliance with the RPS by retail sellers, and allocate and award supplemental energy payments to cover above-market costs of renewable energy.

SB 107 (2006) accelerated the RPS established by SB 1078 by requiring that 20% of electricity retail sales be served by renewable energy resources by 2010 (not 2017). Additionally, SB X1-2 (2011) required all California utilities to generate 33% of their electricity from eligible renewable energy resources by 2020. Specifically, SB X1-2 sets a three-stage compliance period: by December 31, 2013, 20% of electricity had to come from renewables; by December 31, 2016, 25% of electricity had to come from renewables; and by December 31, 2020, 33% will be required to come from renewables.

SB 350 (2015) expanded the RPS by requiring retail seller and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030, with interim goals of 40% by 2024 and 45% by 2027.

SB 100 (2018) accelerated and expanded the standards set forth in SB 350 by establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030 be secured from qualifying renewable energy sources. SB 100 also states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources

supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity does not increase carbon emissions elsewhere in the western grid. Additionally, 100% zero-carbon electricity cannot be achieved through resource shuffling.

Consequently, utility energy generation from non-renewable resources is expected to be reduced based on implementation of the RPS requirements described above. The Proposed Project's reliance on non-renewable energy sources would be reduced accordingly.

Assembly Bill 1007 (2005)

AB 1007 (2005) required the CEC to prepare a statewide plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the plan in partnership with the California Air Resources Board (CARB) and in consultation with other state agencies, plus federal and local agencies. The State Alternative Fuels Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Assembly Bill 32 (2006) and Senate Bill 32 (2016)

In 2006, the state legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 required California to reduce its GHG emissions to 1990 levels by 2020. In 2016, the Legislature enacted SB 32, which extended the horizon year of the state's codified GHG reduction planning targets from 2020 to 2030, requiring California to reduce its GHG emissions to 40% below 1990 levels by 2030. In accordance with AB 32 and SB 32, CARB prepares scoping plans to guide the development of statewide policies and regulations for the reduction of GHG emissions. Many of the policy and regulatory concepts identified in the scoping plans focused on increasing energy efficiencies, using renewable resources, and reducing the consumption of petroleum-based fuels (such as gasoline and diesel). As such, the state's GHG emissions reduction planning framework creates co-benefits for energy-related resources.

State Vehicle Standards

In response to the transportation sector accounting for more than half of California's carbon dioxide (CO_2) emissions, AB 1493 was enacted in 2002. AB 1493 required CARB to set GHG emissions standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emissions standards for motor vehicles manufactured in 2009 and all subsequent model years. The 2009–2012 standards resulted in a reduction in approximately 22% of GHG emissions compared to emissions from the 2002 fleet, and the 2013–2016 standards resulted in a reduction of approximately 30% compared to the 2002 fleet.

In 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global-warming gases with requirements for greater numbers of zero-emissions vehicles into a single package of standards called Advanced Clean Cars. By 2025, when the rules would be fully implemented, new automobiles would emit 40% fewer global-warming gases and 75% fewer smog-forming emissions (CARB 2020). However, the EPA and National Highway Traffic Safety Administration

(NHTSA) published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, which revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. Since California and 22 other states, as well as the District of Columbia and four cities, filed suit against the EPA and a petition for reconsideration of the rule, the effect of the SAFE Rule on the Advanced Clean Cars program is still to be determined pending the ruling of ongoing litigation.

Although the focus of the state's vehicle standards is on the reduction of air pollutants and GHG emissions, one co-benefit of implementation of these standards is a reduced demand for petroleum-based fuels.

Sustainable Communities Strategy

The Sustainable Communities and Climate Protection Act of 2008, or SB 375, coordinates land use planning, regional transportation plans, and funding priorities to help California meet its GHG emissions reduction mandates established in AB 32. As codified in California Government Code Section 65080, SB 375 requires Metropolitan Planning Organizations to include a sustainable communities strategy in their regional transportation plans. The main focus of the sustainable communities strategy is to plan for growth in a fashion that will ultimately reduce GHG emissions, but the strategy is also part of a bigger effort to address other development issues, including transit and vehicle miles traveled (VMT), which influence the consumption of petroleum-based fuels.

4.5.2.3 Local

Metropolitan Transportation Plan/ Sustainable Communities Strategy

The Association of Monterey Bay Area Governments (AMBAG) is the MPO for the region, which includes Monterey, San Benito, and Santa Cruz counties. AMBAG adopted the Monterey Bay 2040 Moving Forward – 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (2040 MTP/SCS), the implementation of which is anticipated to achieve a 4%-per-capita reduction and nearly 7%-per-capita reduction in GHG emissions from passenger vehicles by 2020 and 2035, respectively (AMBAG 2018). The 2040 MTP/SCS outlines the region's proposed transportation network, emphasizing multimodal system enhancements, system preservation, and improved access to high quality transit, as well as land use development that complements this transportation network (AMBAG 2018). These transportation strategies would reduce VMT and associated petroleum fuels.

In addition, local climate action plans and strategies, which include energy-consumption-reduction measures, are described in Section 4.7, Greenhouse Gas Emissions.

4.5.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to energy. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified

4.5.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to energy are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, or
B. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.5.3.2 Analytical Methods

Construction

Electricity

The amount of electricity used during construction of the Proposed Project would be minimal because typical demand would stem from electrically powered hand tools. As such, construction electricity demand is qualitatively addressed.

Natural Gas

Natural gas is not anticipated to be required during construction; therefore, construction natural gas demand is qualitatively addressed.

Petroleum

Potential impacts were assessed for off-road equipment and on-road vehicle trips during construction, as provided by the California Emissions Estimator Model (CalEEMod) outputs (see Appendix F). Fuel consumption from construction equipment and vehicle trips was estimated by converting the total CO_2 emissions anticipated to be generated by the construction of the Proposed Project to gallons using conversion factors for CO_2 to gallons of gasoline or diesel. The conversion factor for gasoline is 8.78 kilograms per metric ton (MT) CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per MT CO_2 per gallon (The Climate Registry 2021). Heavy-duty construction equipment associated with construction activities, vendor trucks, and haul trucks are assumed to use diesel fuel. Worker vehicles are assumed to be gasoline fueled. All details for construction criteria air pollutant emissions modeling discussed in Section 4.2, Air Quality, as well as Appendix F, are also applicable for the estimation of construction-related energy consumption. See Section 4.2.3.2, Analytical Methods, and Appendix F for a discussion of construction emissions calculation methodology and assumptions used in the energy analysis.

Operation

The Proposed Project consists of replacement of 8.75-miles of the existing NCP, as well as minor appurtenances, such as air release valves and isolation valves. Since the Proposed Project is replacing and improving existing pipeline infrastructure, once construction is complete, operations would be similar to existing conditions and would not result in additional energy consumption.

Application of Relevant Standard Construction Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. However, there are no City Standard Construction Practices applicable to energy consumption that are part of the Proposed Project.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.5.3.3 Project Impact Analysis

This section provides a detailed evaluation of energy impacts associated with the Proposed Project.

Impact ENE-1: Result in Wasteful, Inefficient or Unnecessary Consumption of Energy Resources (Significance Threshold A). The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. ***(Less than Significant)***

Construction

Electricity. Temporary electric power for as-necessary lighting and electronic equipment would be provided by MBCP. The amount of electricity used during construction would be minimal because typical demand would be generated by electrically powered hand tools. The electricity used for construction activities would be temporary and minimal; therefore, Proposed Project construction would not result in wasteful, inefficient, or unnecessary consumption of electricity.

Natural Gas. Natural gas is not anticipated to be required during construction of the Proposed Project. Fuels used for construction would primarily consist of diesel and gasoline, which are discussed below. Any minor amounts of natural gas that may be consumed as a result of Proposed Project construction would be temporary and negligible and would not have an adverse effect; therefore, Proposed Project construction would not result in wasteful, inefficient, or unnecessary consumption of natural gas.

Petroleum. Heavy-duty equipment associated with construction would rely on diesel fuel, as would vendor trucks involved in delivery of materials to the project site and haul trucks exporting materials off site. Construction workers would travel to and from the project sites throughout the duration of construction. It is assumed in this analysis that construction workers would travel in gasoline-powered light-duty vehicles. Appendix F lists the assumed equipment usage and vehicle trips for construction of the Proposed Project.

As described above in Section 4.5.3.2, Analytical Methods, fuel consumption from construction equipment was estimated by converting the total CO_2 emissions from each construction phase to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. The conversion factor for gasoline is 8.78 kilograms per MT CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per MT CO_2 per gallon (The Climate Registry 2021).

The estimated diesel fuel usage from construction equipment, haul trucks, and vendor trucks, as well as estimated gasoline fuel usage from worker vehicles is shown in Table 4.5-1.

Table 4.5-1. Proposed Project Construction Petroleum Demand

Proposed Project	Off-Road Equipment (diesel)	Haul Trucks (diesel)	Vendor Trucks (diesel)	Worker Vehicles (gasoline)
	gallons			
Fuel Consumption during Construction	83,971.05	82,344.58	25,975.26	10,604.82
Total Petroleum Demand	**202,895.71**			

Notes: See Appendix F for details.

As shown in Table 4.5-1, the Proposed Project is estimated to consume approximately 202,896 gallons of petroleum during the construction phase. Notably, the Proposed Project will be subject to CARB's In-Use Off-Road Diesel Vehicle Regulation that applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation: (1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; (2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; (3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and 4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The fleet must either show that its fleet average index was less than or equal to the calculated fleet average target rate, or that the fleet has met the Best Achievable Control Technology (BACT) requirements. Overall, because the Proposed Project would not be unusual as compared to overall local and regional demand for energy resources and would be required to comply with existing regulations requiring energy efficient construction vehicles, the Proposed Project construction would not result in wasteful, inefficient, or unnecessary consumption of petroleum.

Operations

As indicated in Section 4.5.3.2, Analytical Methods, once Proposed Project construction is complete, operations would be similar to existing conditions. As such, no additional consumption of energy resources is anticipated during long-term operations.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to wasteful or inefficient energy consumption, and therefore, no mitigation measures are required.

Impact ENE-2: Conflict with an Applicable Renewable Energy or Energy Efficiency Plan (Significance Threshold B). The Proposed Project would not result in conflicts with or otherwise obstruct a state or local plan for renewable energy or energy efficiency. ***(Less than Significant)***

As discussed above in Impact ENE-1, the Proposed Project would not result in wasteful, inefficient, and unnecessary consumption of energy during construction or operation. Energy use during construction would be minimal and temporary. Operations would be similar to existing conditions and would not result in increased

energy demand. Additionally, as discussed in Section 4.7, Greenhouse Gas Emissions, the Proposed Project would not conflict with the various state and local plans that mandate reduced energy use. Overall, the Proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency; therefore, impacts during construction and operation of the Proposed Project would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to conflicts with energy plans, and therefore, no mitigation measures are required.

4.5.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative utilities and energy impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic.

Impact ENE-3: Cumulative Energy Impacts (Significance Thresholds A and B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy. ***(Less than Significant)***

The geographic area considered for the analysis of cumulative energy impacts is Santa Cruz County. Potential cumulative impacts on energy would result if the Proposed Project, in combination with past, present, and future projects, would result in the wasteful or inefficient use of energy. Significant energy impacts could result from development that would not incorporate sufficient building energy efficiency features, achieve building energy efficiency standards, or if projects result in the unnecessary use of energy during construction or operation.

As discussed in Impact ENE-1 and Impact ENE-2, the Proposed Project would not result in wasteful, inefficient, or unnecessary use of energy during construction or operations, nor would it conflict with an applicable plan. The cumulative projects listed in Table 4.0-1 consist of capital improvement projects to the City's water supply infrastructure; other infrastructure projects within Santa Cruz County; and residential, commercial, and mixed-use projects in the vicinity of the Proposed Project. Each project would have a construction period during which electricity, natural gas, and petroleum would be used; however, it is expected that such usage would be temporary and would not constitute a wasteful, inefficient, or unnecessary consumption of energy.

While some of these projects could result in increases in energy consumption during their operation, the increased demand is also anticipated to be minimal relative to statewide energy usage and would not contribute to any potentially significant cumulative energy impacts. Furthermore, the Proposed Project would not result in increased energy use for operations and maintenance of the Proposed Project as these activities would remain the same as currently exist without any increase in employees or new structural appurtenance. It is also noted that any commercial and residential cumulative projects that may take place in the County that include long-term energy demand would be subject to CALGreen, which provides energy efficiency standards. In addition, cumulative projects would be required to meet or exceed the Title 24 building standards, as applicable, further reducing the inefficient use of energy. Future development would also be required to meet

even more stringent requirements, including the objectives set forth in the December 2017 CARB Scoping Plan and Part 6 of Title 24 of the California Code of Regulations, which seek to make all newly constructed residential homes produce a sustainable amount of renewable energy through the use of on-site photovoltaic solar systems. Furthermore, various federal and state regulations, including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program, would serve to reduce the transportation fuel demand of cumulative projects.

For the reasons above, the Proposed Project, together with the cumulative projects, would not result in wasteful, inefficient, or unnecessary use of energy or conflicts with applicable plans. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to energy.

4.5.4 References

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4.6 Geology and Soils

This section describes the existing geology and soils conditions in the vicinity of the Project sites, identifies associated regulatory requirements, evaluates potential Project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on technical studies prepared to date for the Proposed Project (CE&G 2021a, 2021b, 2021c, HDR 2019.2020, Mott MacDonald 2021a) and in part on a vertebrate paleontological records check for paleontological resources from the Natural History Museum of Los Angeles County (LACM) conducted for the Proposed Project.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to geology and soils.

4.6.1 Existing Conditions

4.6.1.1 Regional Geologic Setting

The existing NCP and Proposed Project alignment are located along the western side of the Santa Cruz Mountains, in the central portion of the Coast Ranges Physiographic Province of California. This province consists of a series of coastal mountain chains paralleling the pronounced northwest-southeast structural grain of central California geology between Point Arguello, in Santa Barbara County, and the California/Oregon border. The Proposed Project alignment and surrounding region are underlain by Miocene age sedimentary strata, which in turn is underlain by granitic and metamorphic rocks of the Salinian Block. This suite of basement rocks is separated from contrasting basement rock of the Franciscan Formation to the northeast by the San Andreas Fault System (Figure 4.6-1, Fault Map). While the core of the mountain range is dominated by gneiss, schist, limestone, quartzite, and granite, Cretaceous through Holocene sedimentary rocks and lesser amounts of Tertiary volcanic rocks overlie much of the region (AECOM 2018; USGS 1981, 1997).

4.6.1.2 Site Geology and Stratigraphy

The Proposed Project alignment is underlain primarily by Miocene sedimentary bedrock, Quaternary alluvium, and Quaternary terrace deposits.

Northern Segment

The hilly portions of the northern segment of the proposed alignment are underlain by the middle- to late-Miocene Monterey Formation (or Monterey Shale), middle Miocene Lompico Sandstone, upper Miocene Santa Margarita Sandstone, and Quaternary alluvium (Figure 4.6-2A). The Monterey Shale consists of medium- to thick-bedded and laminated, olive-gray to light gray mudstone and sandy siltstone, including a few thick dolomite interbeds. The Lompico Sandstone consists of pebble conglomerate, thick beds of light gray to yellowish gray, massive (i.e., non-bedded), fine- to medium-grained sandstone, with calcareous (hard, cemented), fossiliferous interbeds. The Santa Margarita Sandstone consists of white to yellowish gray, very thick-bedded to massive, fine- to medium-grained sandstone. This sandstone is generally friable (i.e., easily

crumbled), but is locally calcareous and firm where fossiliferous. The relatively flat-lying, valley areas along the northern segment are underlain by Quaternary alluvium, which consists primarily of relatively unconsolidated silt, sand, and gravel deposits (USGS 1981, 1997).

Brackney Landslide Area

Landslides are widespread in the Santa Cruz Mountains. Although landslides occur in all rock units, landslides are most common in the northern and western parts of the Santa Cruz Mountains, where steeper slopes are underlain by one of the mudstone units. The highly fractured rocks of the Monterey Formation and Santa Cruz Mudstone have been most susceptible to landsliding (USGS 1981, 1997). The California Geological Survey (CGS) has completed Seismic Hazard Zone maps, which include seismically induced landslide zones for select U.S. Geological Survey (USGS) 7.5-minute quadrangle maps in California. The Proposed Project alignment is in the USGS Felton Quadrangle map. A Seismic Hazard Zone map has not been completed for this quadrangle (California Geological Survey [CGS] 2020).

A portion of the existing (and proposed) northern segment traverses the Brackney landslide area. Figures 4.6-3 and Figure 4.6-4 illustrate the location of these landslides with respect to the pipeline alignment, as well as the geologic units or geologic formations, in the vicinity of the Brackney landslide area. Dashed lines in Figure 4.6-4 define the approximate unit contacts, or boundaries, between individual geologic units. This e portion of the Brackney North section of the proposed pipeline alignment traverses an area that has included at least four historical landslides. During the January 1982 and January 2017 storm events, intense rainfall resulted in landslides in this area that blocked road access and damaged the pipeline. The northern-most slide was upslope of the pipeline alignment and terminated on the horizontal easement bench. Two other slides failed downslope of the easement, resulting in a steeper lower slope gradient. The landslides were relatively shallow, generally 5 feet deep, and generally failed along the soil-colluvium/bedrock contact, with possible involvement of the shallowest weathered bedrock. Boulders as large as 1.5 feet in diameter were observed in the landslide debris, and likely contains buried tree trunks (HDR 2019; Mott MacDonald 2021a; Cal Engineering & Geology [CE&G] 2021a, 2021b, 2021c).

Site visits have not detected any obvious bedrock structural failures; only small block failure pop-outs. Based on the high density of fracturing and jointing within the exposed bedrock, slab failure, oriented along joint surfaces (not dip slope), may play a partial role in slope failure of the bedrock exposed regions upslope of the pipeline alignment. The geomorphology of the ground surface, as well as the mature vegetation overlying the landslide surface, suggests this area has a long history of landsliding (i.e., thousands of years minimum). The two mapped 1982 slide areas below the pipeline alignment occur at an outer bend of the San Lorenzo River, where scour would be most aggressive (HDR 2019; Mott MacDonald 2021a; CE&G 2021a, 2021b, 2021c).

Based on exposed rock outcrops, geophysical surveys, five borings, and five test pits/potholes completed along the alignment, the Brackney landslide area is underlain by Monterey Formation deposits, with overlying topsoil, fill, and colluvium. The exposed bedrock in this area is variably weathered, heavily fractured, medium strong, silty fine-grained sandstone and sandy siltstone. Based on the geophysical survey and soil borings, the geologic subsurface conditions along the pipeline corridor and underlying the pipeline can be divided into two distinct zones as described below.



SOURCE: USGS 2020

DUDEK

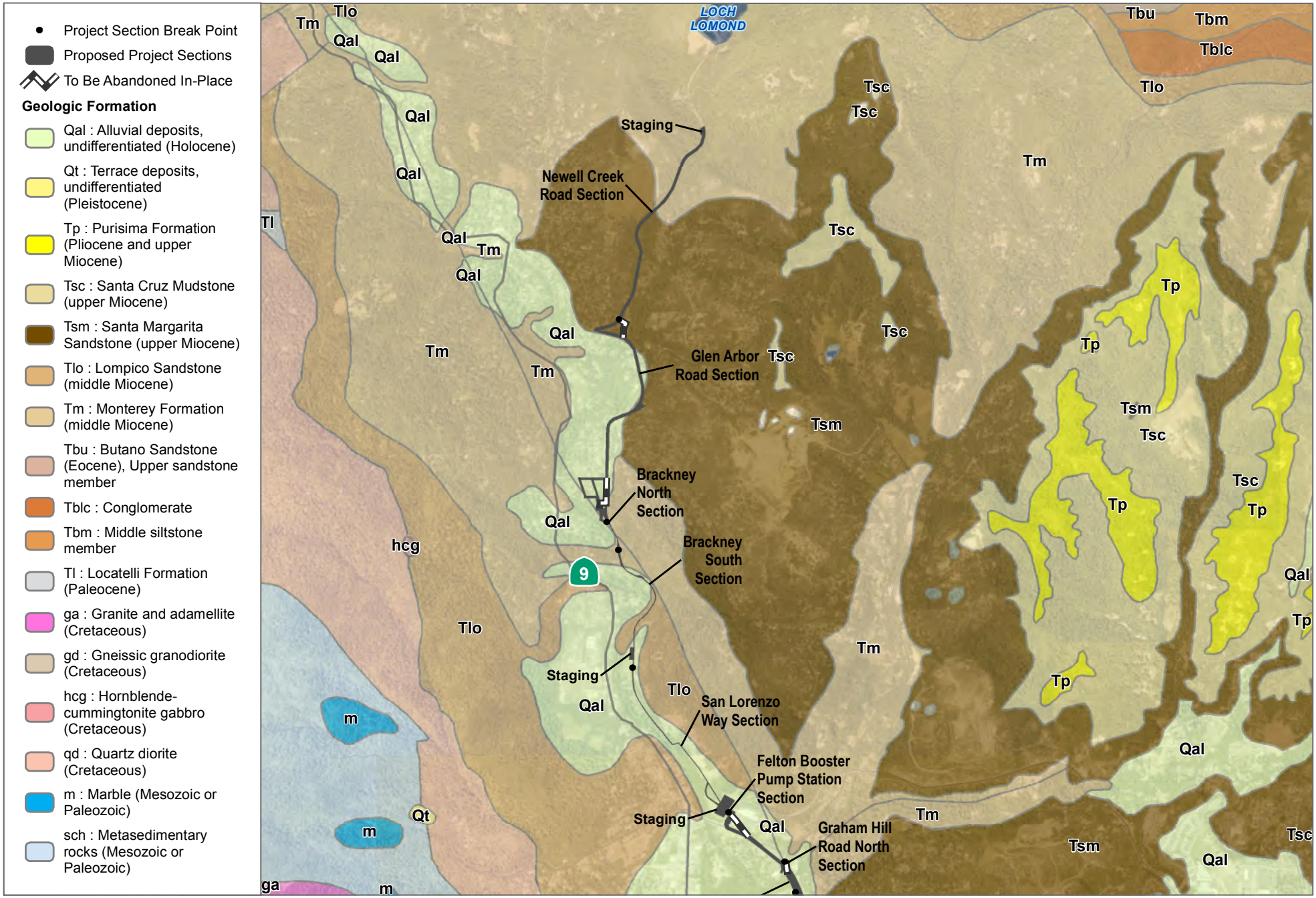
0 1.5 3 Miles

FIGURE 4.6-1

Fault Map

Newell Creek Pipeline Improvement Project

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SOURCE: ESRI 2020, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

DUDEK

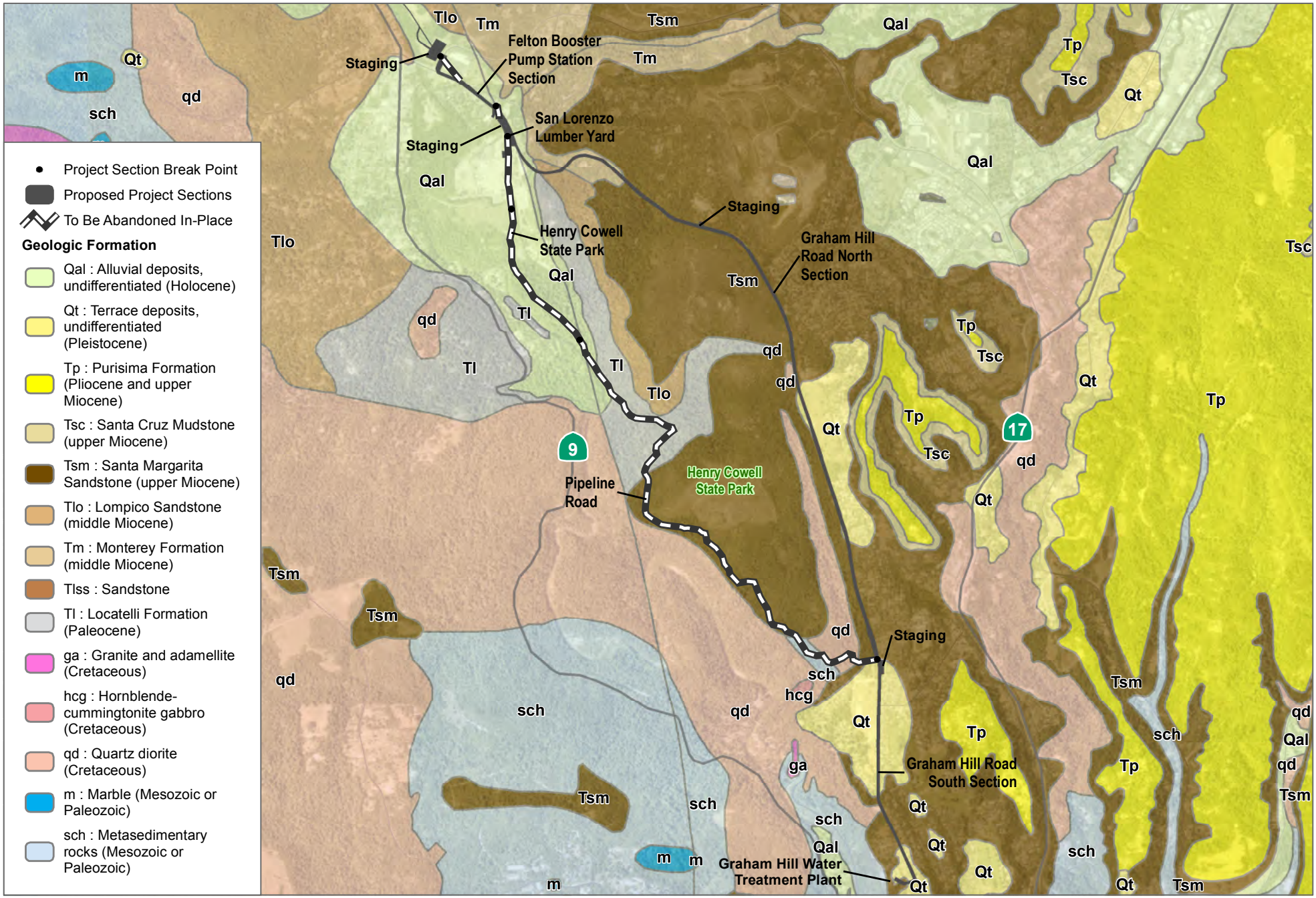
0 1,500 3,000 Feet

FIGURE 4.6-2A

Geology Map - Northern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: USGS National Map 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

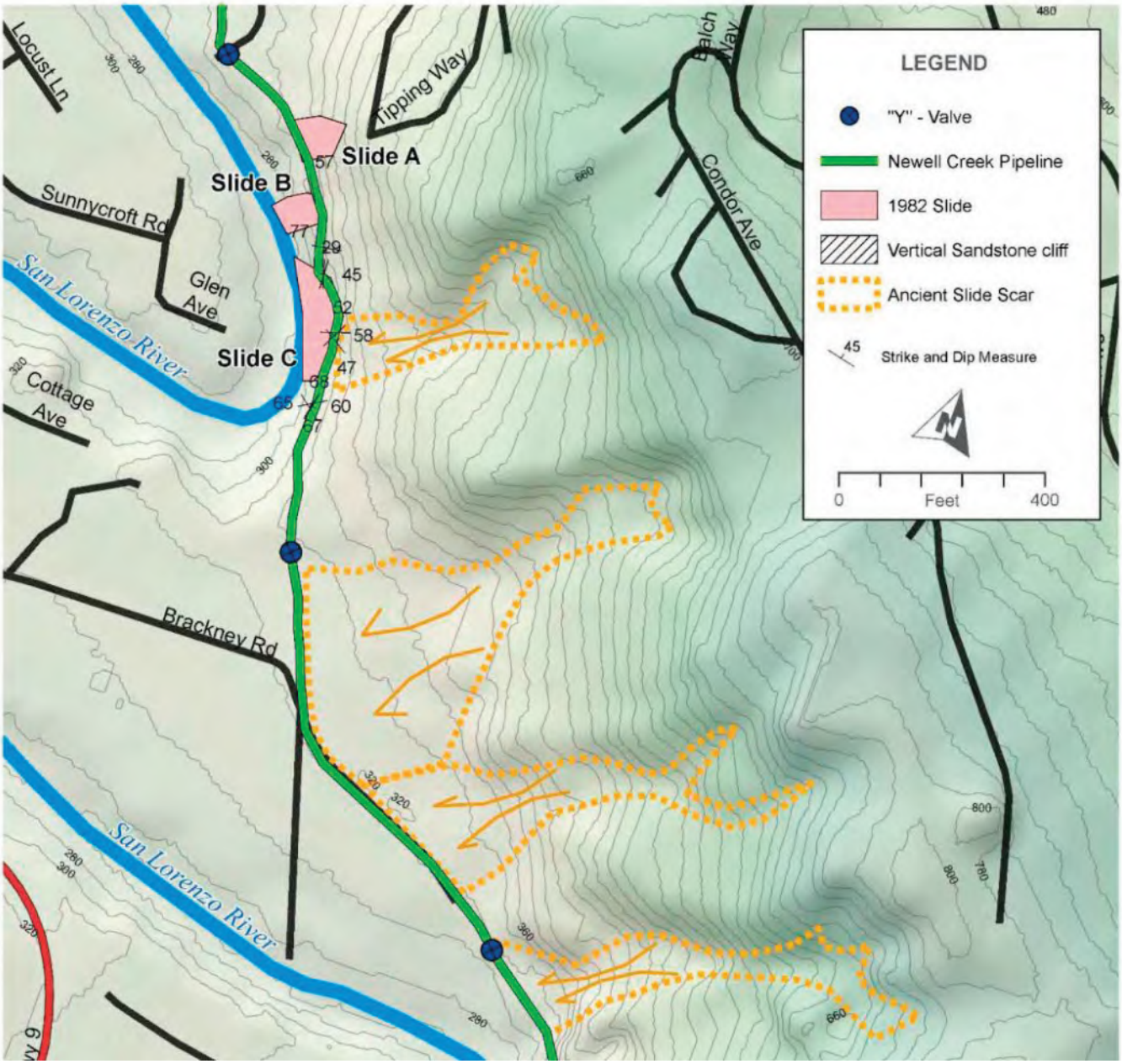
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FIGURE 4.6-2B

Geology Map - Southern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: Mott MacDonald 2021

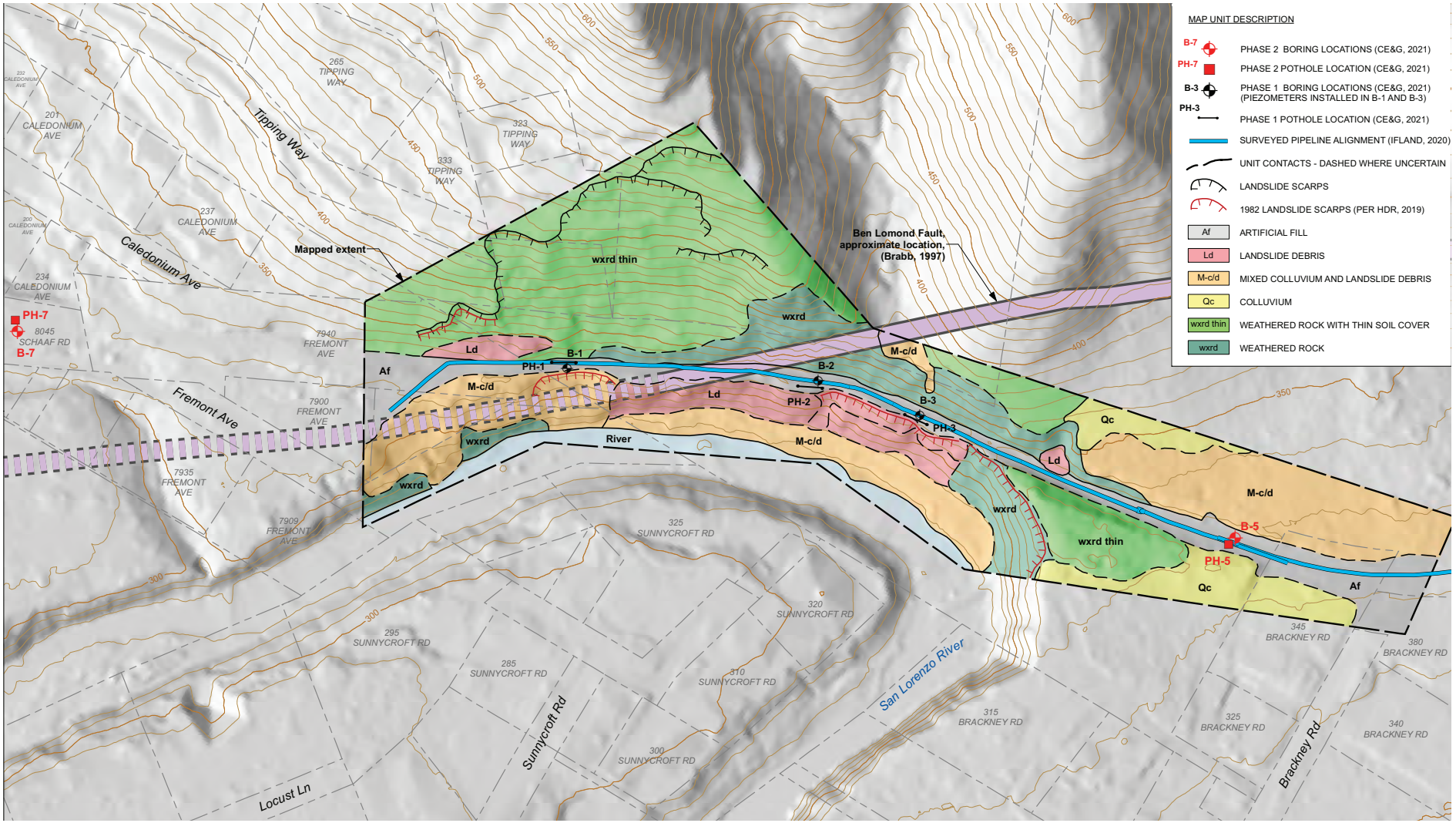
FIGURE 4.6-3

Brackney Landslide Area

Newell Creek Pipeline Improvement Project

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BASEMAP REFERENCE

1. 5 FT CONTOURS AND HILLSHADE DERIVED FROM 3FT DTM (2018-2020) FROM TUKMAN GEOSPATIAL.
2. PARCEL DATA FROM SANTA CRUZ COUNTY GIS DATABASE, ACCESSED ONLINE ON 3 AUG 2018.

0 50 100 200
FEET

SOURCE: CE&G 2021

DUDEK

FIGURE 4.6-4

Detail of Brackney Landslide Area

Newell Creek Pipeline Improvement Project

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The first zone is a broad colluvial and landslide debris fan at the southern end of the pipeline, bound to the north by the steepening hillslopes and extending south beyond the project area. The mixed colluvium and landslide debris unit consists of sandy silt with gravel and is interpreted as extending across a broad swale up to 25 feet below ground surface. The second zone is characterized by steep hillslopes cut by the old railroad grade, with exposed or thinly covered bedrock upslope of the road, and fill and landslide debris covered bedrock on the over-steepened slopes below the road and above the San Lorenzo River. The subsurface conditions for this zone can be characterized by 1 to 10 feet of colluvium and fill overlying an undulatory bedrock surface (Mott MacDonald 2021a; CE&G 2021a, 2021b, 2021c).

A transition zone of extremely weak to weak, highly- to slightly-weathered Monterey Formation silty sandstone occurs below the surficial fill, colluvial, and landslide deposits (described above), extending to depths of 13 to 20 feet below ground surface. The weathered bedrock is underlain by slightly weathered to fresh Monterey bedrock, to a depth of 80 feet (the depth of the borings). The top of the fresh bedrock, which is characterized as fine-grained, silty sandstone, varies from a depth of 13 to 25 feet below ground surface. The silty sandstone is friable (i.e., easily crumbled) and extremely weak to weak rock. Observed fractures, using a downhole acoustic televiewer, were generally parallel to bedding and were either partially or completely filled with clay. Although small block failure pop-outs were observed during site reconnaissance, no large-scale deep-seated bedrock failures were observed (HDR 2019; Mott MacDonald 2021a; CE&G 2021a, 2021b, 2021c).

The existing pipeline easement is approximately 10 to 15 feet wide, generally level longitudinally, but benched into a steep cross slope. The easement in this area consists of a narrow gravel and dirt road, which runs generally north-south. The pipeline is 4 to 8 feet below ground surface along this dirt road, which mostly slopes into the hillside, drained by four or five culverts, which divert water from the east side of the road to the west side of the road, but may be partially blocked (Mott MacDonald 2021a; CE&G 2021a, 2021b, 2021c).

The topography west of the easement slopes steeply downwards to the San Lorenzo River, at gradients generally greater than 0.5:1, horizontal to vertical. The river is approximately 60 vertical feet below the pipeline easement. Similarly, the topography east of the easement slopes steeply upward, at gradients generally exceeding 1:1, and locally exceeding 0.5:1. Fill underlies much of the dirt road. At various locations along the road, landslide and erosion debris cover the pipeline alignment by several feet to over 10 to 20 feet. Most of the slopes are somewhat densely vegetated, with legacy large redwood tree stumps locally present. Topographic contours and mature vegetation on the slide areas below ancient slide scars (Figure 4.6-3) suggests the area has a long history of landslides, perhaps thousands of years (Mott MacDonald 2021a; CE&G 2021a, 2021c).

Southern Segment

The hilly portions of the southern segment of the proposed pipeline alignment are similarly underlain by Monterey Shale, Lompico Sandstone, and Santa Margarita Sandstone, whereas the relatively flat-lying valley areas are underlain by Quaternary alluvium (Figure 4.6-2B). In addition, relatively flat-lying Quaternary Terrace deposits, consisting of weakly consolidated, sandy, pebble to cobble gravel and pebbly fine to medium sand, are locally present along the southern half of the southern segment (USGS 1981, 1997).

A geotechnical investigation report, completed by Crawford and Associates, was summarized in the Basis of Design Report (Carollo Engineers 2021a). Based on 20 new soil borings drilled along the southern segment, to a maximum depth of 46 feet, as well as a review of previous boring data collected by Pacific Geotechnical

Engineering, soils beneath the southern segment generally consist of poorly graded sand with silt and clayey/silty sand. The upper soils were loose, underlain by progressively denser soils.

Subsidence

Subsidence occurs when a large portion of land is vertically displaced, usually due to the withdrawal of groundwater, oil, or natural gas, or as a result of decomposition of natural organic materials. Soils that are particularly subject to subsidence include those with high silt or clay content and/or high organic content. The effects of subsidence include damage to buildings and infrastructure, increased flood risk in low-lying areas, and lasting damage to groundwater aquifers and aquatic systems. The Proposed Project alignment, including the both the northern and southern segments, is not in an area of historic or recent subsidence due to groundwater extraction (Luhdorff & Scalmanini Consulting Engineers, Inc., California Water Foundation 2020). These bedrock deposits are not high in silt, clay, or organic content and therefore would not be susceptible to subsidence due to high organic content.

Expansive Soils

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried. Expansive soils can cause structural foundations to rise during the rainy season and fall during the dry season. If this expansive movement varies underneath different parts of the structure, foundations may crack and portions of the structure may be distorted. The potential for soil to undergo shrink and swell is greatly enhanced by the presence of a fluctuating, shallow groundwater table. Changes in the volume of expansive soils can result in the consolidation of soft clays after the lowering of the water table or the placement of fill. As previously discussed, the Proposed Project alignment, including the Northern and Southern segments, is underlain primarily by Monterey Shale, Lompico Sandstone, and Santa Margarita Sandstone with overlying surficial deposits of alluvium, colluvium, topsoil, and fill. The overlying surficial deposits may locally be clay-rich and susceptible to soil expansion.

4.6.1.3 Regional Seismicity and Seismic Hazards

The Proposed Project alignment is located in a seismically active region of California, between two major Holocene-active faults, including the San Andreas Fault, located approximately 7 miles to the northeast, and the San Gregorio Fault, located approximately 9 miles to the southwest, as shown on Figure 4.6-1. Historical earthquakes along the San Andreas Fault and its branches have caused substantial seismic shaking in Santa Cruz County in historical times. The two largest historical earthquakes to affect the area were the moment magnitude (Mw) 7.9 San Francisco earthquake of April 18, 1906, and the Mw 6.9 Loma Prieta earthquake of October 17, 1989 (corresponding to Richter magnitudes of 8.3 and 7.1, respectively) (City of Santa Cruz 2012).

The San Francisco earthquake caused severe seismic shaking and structural damage to many buildings in the Santa Cruz Mountains. The Loma Prieta earthquake may have caused more intense seismic shaking than the 1906 event in localized areas of the Santa Cruz Mountains, although its regional effects were not as extensive. Based on a seismometer located at the University of California Santa Cruz (UCSC) campus, approximately 1.0 mile from the southern Proposed Project alignment, peak ground accelerations during the Loma Prieta earthquake were approximately 0.5 g (percent of gravity). There were also major earthquakes in northern California along or near the San Andreas Fault in 1838, 1865, and possibly 1890 (AECOM 2018; City of Santa Cruz 2012).

Regional Faulting

As previously discussed, Santa Cruz County is located in a portion of California that is crossed by a number of faults. The CGS classifies faults as:

- Holocene-active faults, which are faults that have moved during the past approximate 11,700 years. These faults are capable of surface rupture.
- Pre-Holocene faults, which are faults that have not moved in the past 11,700 years. This class of fault may be capable of surface rupture but is not regulated under the Alquist-Priolo Earthquake Fault Zoning Act of 1972.
- Age-undetermined faults, which are faults where the recency of fault movement has not been determined (CGS 2018).

This fault classification is consistent with criteria of the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (see Section 4.6.2, Regulatory Framework, for information about this act). Distances to regional faults, maximum probable earthquake magnitudes, and recurrence intervals are shown in Table 4.6-1.

Table 4.6-1. Distances to Local Faults

Fault	Distance from Proposed Project Site (miles)	Maximum Probable Earthquake Magnitude (moment magnitude)	Approximate Time Between Major Earthquakes (years)
San Gregorio	9	7.5	400
Zayante-Vergeles	1	7.5	8,821
Monterey Bay-Tularcitos	5	6.5	2,841
San Andreas	7	7.8	210
Ben Lomond	0	5.5	Not Holocene-Active

Sources: AECOM 2018; City of Santa Cruz 2012; USGS 1974, 2017a, 2017b, 2017c, 2017d, 2020.

The northern terminus of the Proposed Project alignment is located approximately 1 mile southwest of the Zayante-Vergeles Fault (see Figure 4.6-1) (USGS 2020), which is mapped by the USGS as a late Pleistocene to possibly Holocene fault, active within the past 15,000 years (i.e., Holocene-active to pre-Holocene fault). The Zayante-Vergeles Fault is marked by a zone of relatively parallel fault traces that extend from the vicinity of West Waddell Creek, southeast through the Santa Cruz Mountains, beneath Quaternary alluvium of the Pajaro River, and across the northern Gabilan Range, where the fault has a complex junction with the San Andreas Fault, approximately 5 miles southeast of Hollister (USGS 2000). For planning purposes, the maximum probable earthquake associated with the Zayante-Vergeles Fault is Mw 7.5 (USGS 2017a).

The Proposed Project alignment is approximately 7 miles southwest of the San Andreas Fault (see Figure 4.6-1) (USGS 2020), which is a 680-mile network of Holocene-active faults that collectively accommodate the majority of the north-south motion between the North American and Pacific tectonic plates. The San Andreas Fault Zone is considered to be a Holocene-active and historically active strike-slip fault that extends along most of coastal California, from its complex junction with the Mendocino Fault Zone on the north, southeast to the northern Transverse Range, and inland to the Salton Sea, where a well-defined zone of seismicity (i.e., the Brawley Seismic Zone) transfers slip to the Imperial Fault. Two major surface-rupturing earthquakes have occurred in historic time, including the 1857 Fort Tejon earthquake and the 1906 San Francisco earthquake

(USGS 2002). For planning purposes, the maximum probable earthquake associated with the San Andreas Fault is Mw 7.8 (USGS 2017b).

The Proposed Project alignment is approximately 9 miles east-northeast of the San Gregorio Fault (see Figure 4.6-1) (USGS 2020), which is a Holocene-active (past 11,700 years), structurally complex fault zone as much as 3 miles wide. The fault zone is primarily located offshore, west of San Francisco Bay and Monterey Bay, with onshore locations at promontories, such as Moss Beach, Pillar Point, Pescadero Point, and Point Año Nuevo. The San Gregorio Fault is a complex fault zone consisting of several named faults, including the Seal Cove, Frijoles, Coastways, Greyhound Rock, Carmel Canyon, Denniston Creek, and Año Nuevo Faults. This fault zone extends from Bolinas Lagoon south to the Point Sur region (USGS 1999). For planning purposes, the maximum probable earthquake associated with the San Gregorio Fault is Mw 7.5 (USGS 2017c).

The Proposed Project alignment is approximately 5 miles north of the Monterey Bay-Tularcitos Fault Zone (see Figure 4.6-1), which is generally considered late Quaternary (past 15,000 years) (USGS 2020); however, portions of this fault are considered Holocene-active (past 11,700 years). This offshore fault zone is a complex, generally northwest-trending zone up to 9 miles wide, consisting primarily of right-lateral, reverse/thrust faults, extending across Monterey Bay southeast to the Monterey Peninsula, to near the crest of the Sierra de Salinas (USGS 2001). For planning purposes, the maximum probable earthquake associated with the Monterey Bay-Tularcitos Fault Zone is Mw 7.3 (USGS 2017d).

In addition, the Ben Lomond Fault underlies the Brackney landslide area, in the southern portion of the northern pipeline segment (Figure 4.6-4) (Mott MacDonald 2021a, 2021b; CG&E 2021a, 2021b). This fault has been mapped generally along the San Lorenzo River from Boulder Creek to Felton, as well as within west Santa Cruz, traversing the coastline just east of Mitchell's Cove. Although well-defined in the Brackney landslide area, this late Quaternary fault (past 130,000 years) is not well-located throughout much of the area and is not Holocene-active (USGS 1981, 2020). The most recent movement on the Ben Lomond Fault occurred about 85,000 years ago (Mott MacDonald 2021b; Stanley and McCaffrey 1983).

Surface Rupture

Surface rupture involves the displacement and cracking of the ground surface along a fault trace. Surface ruptures are visible instances of horizontal or vertical displacement, or a combination of the two, typically confined to a narrow zone along the fault. Surface rupture is more likely to occur in conjunction with Holocene-active fault segments, where earthquakes are large, or where the location of the movement (earthquake hypocenter) is shallow.

As discussed in Section 4.6.2, Regulatory Framework, the Alquist-Priolo Earthquake Fault Zoning Act of 1972 regulates development near Holocene-active faults to mitigate the hazard of surface fault rupture. This Act requires the State Geologist to establish regulatory zones (known as Alquist-Priolo Earthquake Fault Zones) around the surface traces of Holocene-active faults and to issue appropriate maps. Local agencies must regulate most development Projects within the zones. The CGS has completed Seismic Hazard Zone maps, which include Alquist-Priolo Earthquake Fault Zones, for select USGS quadrangle maps in California. The Project alignment is located in the USGS 7.5-minute Felton Quadrangle map. As stated above, a Seismic Hazard Zone map has not been completed for this quadrangle (CGS 2020). The Alquist-Priolo Earthquake Fault Zone located closest to the Project is associated with the onshore portion of the San Gregorio Fault, located approximately 10.5 miles west of the Project alignment (CGS 2020; CDMG 1982). As previously discussed,

although the Ben Lomond Fault traverses the northern segment, this fault is not Holocene-active. Therefore, the Project site is not expected to be subject to fault rupture.

Liquefaction and Lateral Spreading

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming like quicksand. Factors determining the liquefaction potential are soil type, the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. Liquefaction generally occurs at depths of less than 40 feet in soils that are young (Holocene-age), saturated, and loose (CGS 2004). Soils that are most susceptible to liquefaction are clay-free deposits of sands and silts, and unconsolidated alluvium.

The CGS has completed Seismic Hazard Zone maps, which include liquefaction zones, for select USGS quadrangle maps in California. As stated above, the Project alignment is located in the USGS Felton Quadrangle map. A Seismic Hazard Zone map has not been completed for this quadrangle (CGS 2020). However, the County of Santa Cruz has created Geologic Hazard maps that include areas of potential liquefaction in the County. As indicated in Figures 4.6-5A and 4.6-5B, portions of the northern and southern pipeline segments are in areas of moderate liquefaction potential.

Lateral spreading is the lateral movement of unsupported soils in association with liquefaction. Examples of areas/scenarios prone to lateral spreading include: 1) liquefaction-prone soils on slopes adjacent to creeks, rivers, canals, or lakes; and 2) liquefaction-prone soils during excavation and construction of subterranean parking garages. Lateral spreading may occur in areas where the Proposed pipeline alignment traverses slopes and is also within an area of liquefaction prone soils. For example, a geotechnical investigation completed for the Felton Booster Pump Station, at the northern end of the southern segment (Figure 4.6-2B), concluded that the slopes adjacent to Zayante Creek have a high potential for lateral spreading in the event of a strong earthquake (Pacific Geotechnical Engineering 2002).

4.6.1.4 Unique Geological Features

According to the County of San Diego (2007), which provides guidelines for determining significance of unique geological features throughout California, unique geological features include one or more of the following criteria:

- Is the best example of its kind locally or regionally;
- Embodies the distinctive characteristics of a geologic principle that is exclusive locally or regionally;
- Provides a key piece of geologic information important in geology or geologic history;
- Is a “type locality” of a geologic feature;
- Is a geologic formation that is exclusive locally or regionally;
- Contains a mineral that is not known to occur elsewhere in a County; or
- Is used repeatedly as a teaching tool.

Unique geological features do not include surficial geological expressions that are visually appealing. No unique geologic features are located along the Project alignment.

4.6.1.5 Paleontological Resources

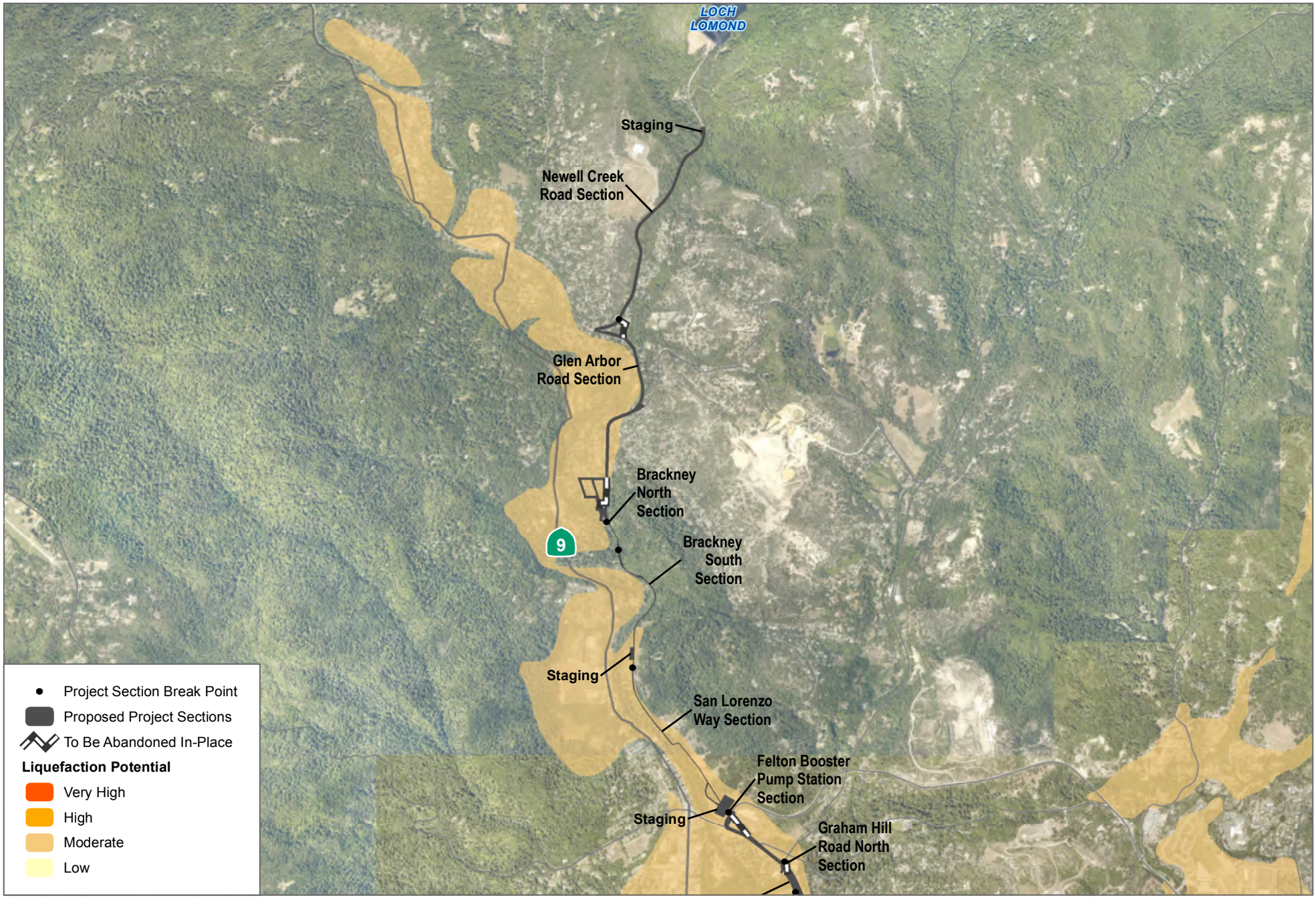
Paleontological resources are the fossilized remains, traces, and associated data of plants and animals, preserved in earth's crust, that are generally considered to be older than middle Holocene (approximately 5,000 radiocarbon years before present) (SVP 2010). Body fossils include bones, teeth, shells, leaves, and wood, while trace fossils include trails, trackways, footprints, and burrows. With the exception of fossils found in low-grade metasedimentary rocks, significant paleontological resources are found in sedimentary rock units that are old enough to preserve the remains or traces of plants and animals.

To determine paleontological sensitivity of individual rock units present along the Proposed Project alignment, a paleontological records search was requested from the LACM on April 23, 2021 and desktop geological and paleontological research was conducted. The LACM records search results indicated that they have no paleontological localities within the Proposed Project alignment boundaries, but they do have Miocene age fossil localities near the Proposed Project alignment. The fossiliferous geological units reported by the LACM include the Santa Margarita Formation, the Monterey Formation, and the Purisima Formation. Of these geological formations, only the Santa Margarita and Monterey Formations are mapped along the Proposed Project alignment.

The LACM reported five fossil localities from the Santa Margarita Formation near the Proposed Project alignment. Fossil locality LACM IP (Invertebrate Paleontology) 22182 produced a fossil sand dollar (*Astrodapsis spatiosus*) from an unknown depth beneath the ground surface (bgs), east of Felton (Mount Hermon) in an area mapped as the Santa Margarita Formation (LACM 2021). Fossil localities LACM VP (Vertebrate Paleontology) 1779 and LACM VP 3332, which are located near Glen Canyon Road and Redwood Drive, yielded a fossil dugong (*Metaxytherium*) and a member of the sea lion family (Otariidae) from an unknown depths bgs. Fossil locality LACM VP 3333 produced fossil marine mammals including *Paleoparadoxia*, *Desmostylus*, and the dolphin, *Liolithax*, recovered from a sand and gravel quarry within the Santa Margarita Formation, north of Camp Evers Junction in Scotts Valley (LACM 2021). Finally, the LACM reported a fossil marine mammal (*Paleoparadoxia tabatai*) from the Santa Margarita Formation several miles north of Santa Cruz.

The LACM did not report any localities from the Monterey Formation in the records search for the Proposed Project. Throughout its extent (from Orange County in the south to north of San Francisco Bay), the Monterey Formation has produced thousands of fossil traces, invertebrates, and vertebrates. Vertebrate taxa include sharks, bony fish, reptiles, and marine mammals (Koch et al. 2004). Dozens of bony fish species from multiple localities were reported from the Monterey Formation in a catalog of Neogene bony fishes from California (Fierstine et al. 2012). Furthermore, a new genus and species of eared seal was reported from the Monterey Formation of Los Angeles County (Downs 1956). In addition to vertebrate fossils recovered from the Monterey Formation, numerous Monterey Formation fossil invertebrates have been described in the scientific literature including two new stomatopod crustacean species (Hof and Schram 1998). Finally, a small, Monterey Formation invertebrate fauna was published in the literature, which consisted of bivalves, gastropods, and an echinoid that were collected during excavations for a housing development in south Orange County (Rugh 2018).

The LACM did not report any fossil localities from the Lompico Sandstone; however, this geological unit, which underlies the Monterey Formation, has produced scientifically significant invertebrate fossils. Clark (1981) reported foraminifers, echinoids, and bivalves from the Lompico Sandstone in Santa Cruz County.



SOURCE: ESRI 2020, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

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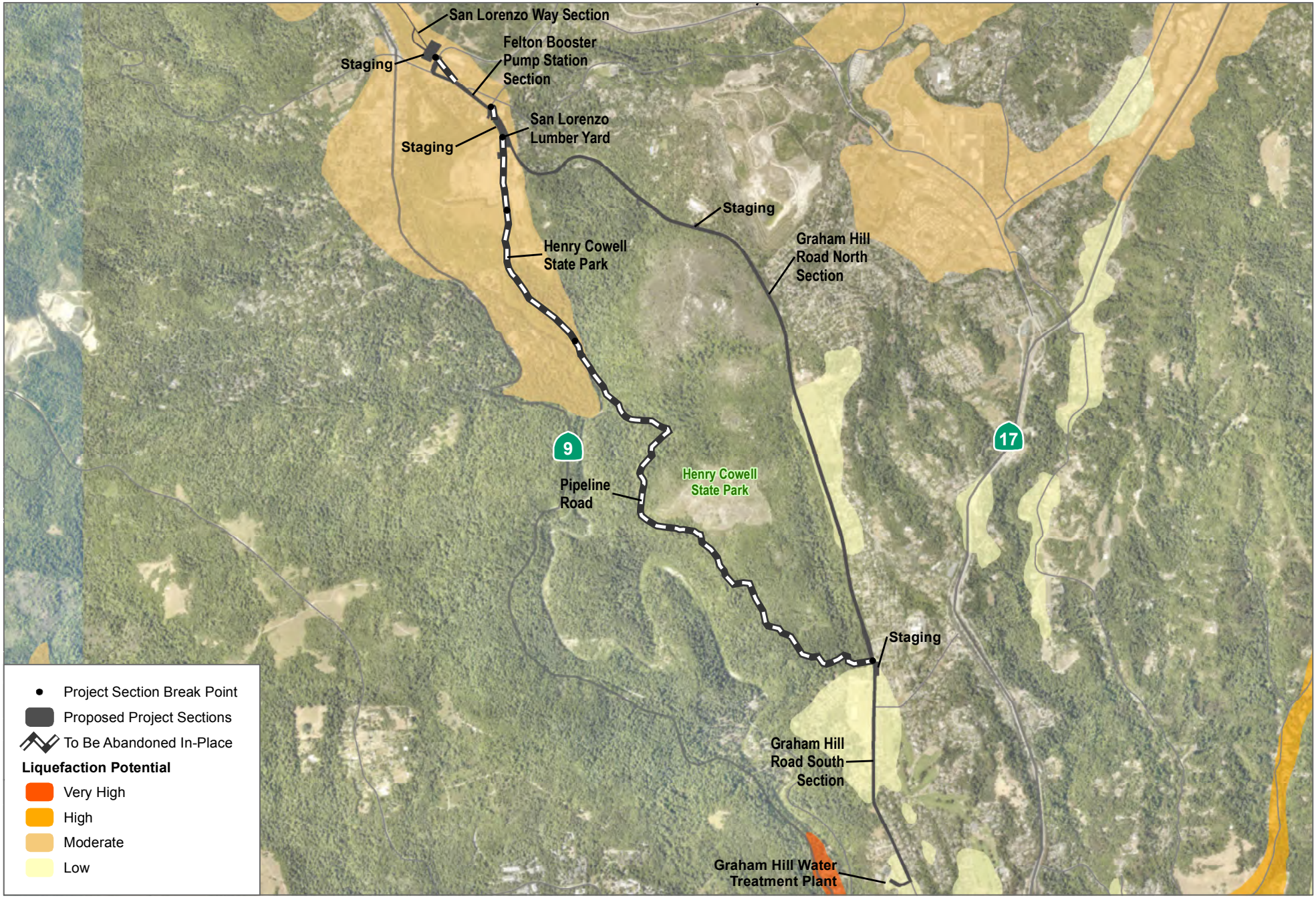
0 1,500 3,000 Feet

FIGURE 4.6-5A

Liquefaction Map - Northern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: USGS National Map 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

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0 1,500 3,000 Feet

FIGURE 4.6-5B

Liquefaction Map - Southern Segment

Newell Creek Pipeline Improvement Project

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The Santa Margarita Formation has high paleontological sensitivity. Proposed Project pipe sections that are located within this formation include:

- Northern segment: Newell Creek Road section and portions of the Glen Arbor Road section
- Southern segment: Graham Hill Road North section

Overall, the Monterey Formation has produced scientifically significant fossils and is considered to have high paleontological resources sensitivity. Proposed Project pipe sections that are located within this formation include:

- Northern segment: portion of the Brackney North section
- Southern segment: portion of Graham Hill Road North section

The Lompico Sandstone is considered to have high paleontological resources sensitivity. Proposed Project pipe sections that are located within this formation include:

- Northern segment: portion of the Brackney South section
- Southern segment: portion of Graham Hill Road North section

4.6.2 Regulatory Framework

4.6.2.1 Federal

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act (42 U.S.C., Section 7701) is a statute formulation a national policy to diminish the perils of earthquakes in the United States. The National Earthquake Hazards Reduction Program, created under this act, mandated that four federal agencies maintain responsibility for long-term earthquake risk reduction. These agencies included the USGS, the National Science Foundation, the Federal Emergency Management Agency, and the National Institute of Standards and Technology. These agencies assess U.S. earthquake hazards, deliver notifications of seismic events, develop measures to reduce earthquake hazards, deliver notifications of seismic events, develop measures to reduce earthquake hazards, and conduct research to help reduce overall U.S. vulnerability to earthquakes. In November 2018, Congress passed the National Earthquake Hazards Reduction Program Reauthorization Act of 2018. This new act largely leaves the current four-agency National Earthquake Hazards Reduction Program intact, while providing some new areas of emphasis.

Paleontological Resources Protection Act

The Paleontological Resources Protection Act (PRPA) of 2009 directs the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land using “scientific principles and expertise.” The PRPA incorporates most of the recommendations of the report of the Secretary of the Interior entitled "Assessment of Fossil Management on Federal and Indian Lands (USDI, 2000) in order to formulate a consistent paleontological resources management framework. In passing the PRPA, Congress officially recognized the scientific importance of paleontological resources on some federal lands by declaring that fossils from these lands are federal property that must be preserved and protected. The PRPA codifies existing

policies of the Bureau of Land Management (BLM), National Park Service (NPS), United States Forest Service (USFS), Bureau of Reclamation, and United States Fish and Wildlife Service (USFWS) and provides the following:

a. criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands;

b. minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants);

c. definitions for "paleontological resources" and "casual collecting"; and

d. requirements for curation of federal fossils in approved repositories.

The PRPA requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land. The PRPA furthers the protection of fossils on federal lands by criminalizing the unauthorized removal of fossils.

4.6.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (Public Resources Code [PRC] Sections 2621 through 2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. A structure for human occupancy is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a structure for human occupancy can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, the local agency must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (PRC Sections 2690 through 2699.6 et seq.), passed by the California State Legislature in 1990, addresses earthquake hazards from non-surface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, strong ground shaking, or other earthquake and geologic hazards.

California Building Standards Code

The state regulations protecting structures from geo-seismic hazards are contained in the California Building Standards Code (24 California Code of Regulations Part 2) (the California Building Code), which is updated every 3 years. These regulations apply to public and private buildings/structures in the state, including construction of utilities. Until January 1, 2008, the California Building Code was based on the then-current

Uniform Building Code and contained additions, amendments, and repeals specific to building conditions and structural requirements of the State of California. The 2019 California Building Code, effective January 1, 2020, is based on the current (2018) International Building Code and enhances the sections dealing with existing structures. Seismic-resistant construction design is required to meet more stringent technical standards than those set by previous versions of the California Building Code. Construction activities are also subject to Chapter 33 of the California Building Code.

California Division of Occupational Safety and Health

Construction activities are subject to occupational safety standards for excavation and trenching, as specified in California Division of Occupational Safety and Health (also known as Cal/OSHA) regulations (Title 8 of the California Code of Regulations). These regulations specify the measures to be used for excavation and trench work where workers could be exposed to unstable soil conditions. The Proposed Project would be required to employ these safety measures during excavation, trenching, and tunneling.

State Earthquake Protection Law

The State Earthquake Protection Law (Health and Safety Code Section 19100 et seq.) requires that structures be designed and constructed to resist stresses produced by lateral forces caused by wind and earthquakes, as provided in the California Building Code. Chapter 16 of the California Building Code sets forth specific minimum seismic safety and structural design requirements, requires a site-specific geotechnical study to address seismic issues, and identifies seismic factors that must be considered in structural design. Because the Project alignment is not located within an Alquist-Priolo Earthquake Fault Zone, as noted above, no special provisions would be required for the Proposed Project related to fault rupture.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This analysis satisfies Project requirements in accordance with CEQA (13 PRC Section 21000 et seq.) and PRC Section 5097.5 (Stats 1965, c. 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the Society of Vertebrate Paleontology (SVP) (SVP 2010).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the "Environmental Checklist Form," which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]." This provision covers fossils of signal importance—remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group—as well as localities that yield fossils significant in their abundance, diversity, and preservation,. Further, CEQA provides that generally, a resource shall be considered "historically significant" if it has yielded or may be likely to yield information important in prehistory (PRC Section 15064.5[a][3][D]). Paleontological resources would fall within this category. Chapter 1.7, Sections 5097.5 and 30244 of the PRC defines unauthorized removal of fossil resources as a misdemeanor and requires mitigation of disturbed sites.

4.6.2.3 Local

The study area for the Proposed Project includes the unincorporated County of Santa Cruz and the City of Santa Cruz where the Graham Hill Water Treatment Plant (GHWTP) is located. The general plans and, where relevant, the local coastal programs of these jurisdictions include policies and programs related to geology, soils and paleontology.

County of Santa Cruz General Plan and Local Coastal Program

The Conservation and Open Space Chapter of the Santa Cruz County General Plan outlines policies and programs for the protection of hydrological, geological, and paleontological features (County of Santa Cruz 2020).

Chapter 16.44 (Paleontological Resource Protection) of the Santa Cruz County Code outline methods and regulations for the identification and treatment of paleontological resources within the County.

City of Santa Cruz General Plan

The Project alignment is in unincorporated Santa Cruz County, except for the southernmost pipe section that connects with the City's GHWTP. Therefore, the City of Santa Cruz General Plan only applies to the Proposed Project for a limited area. As such, the policies of these plans are not summarized or further evaluated in this section.

4.6.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to geology and soils. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.6.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to geology and soils are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

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.
   ii. Strong seismic ground shaking.
   iii. Seismic-related ground failure, including liquefaction.

iv. Landslides.

B. Result in substantial soil erosion or the loss of topsoil.

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.

D. Be located on expansive soil, as defined in the 2019 California Building Code, creating substantial direct or indirect risks to life or property.

E. Have soils incapable of adequately supporting the use 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.

4.6.3.2 Analytical Methods

The following analysis considers whether the Proposed Project would directly or indirectly cause geologic and soils impacts, taking into account state-mandated construction methods, as specified in the California Safety and Health Administration regulations (Title 8 of the California Code of Regulations) and in Chapter 33 of the California Building Code. Moreover, the analysis considers whether a unique paleontological resource, site, or unique geologic feature would be directly or indirectly destroyed as a result of the Proposed Project.

Application of Relevant Standard Construction Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. Standard Construction Practices #1-4 would reduce project-related erosion by requiring erosion control best management practices, soil stockpile containment, and runoff control.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, if applicable, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.6.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance for the following reasons:

- **Earthquake Fault Rupture (Significance Threshold A-i)**. The Proposed Project would not have the potential to directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault because the Project alignment is not located within an Alquist-Priolo Earthquake Fault Zone or underlain by any Holocene-active faults.

- **Loss of Topsoil (Significance Threshold B).** The Proposed Project consists of installation of a new water pipeline primarily within developed roadways. Construction would not result in loss of topsoil as most of excavation would occur in previously disturbed areas. Soils removed during trenchless construction operations would be replaced on site or with engineered fill. Thus, the Proposed Project would not result in loss of topsoil. Potential erosion during construction is addressed in Section 4.9, Hydrology and Water Quality.

- **Septic Tanks/Alternative Wastewater Disposal (Significance Threshold E)**. The Proposed Project would not entail wastewater disposal. During construction, temporary portable toilets would be installed for construction workers. Waste from the portable toilets would be transported off-site in vacuum trucks for disposal at the City's wastewater treatment facility. Therefore, the Proposed Project would have no impacts related to soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems.

Project Impacts

Impact GEO-1: Seismic Hazards (Significance Thresholds A-ii and A-iii). The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic-related ground failure, including liquefaction. ***(Less than Significant)***

As discussed in Section 4.6-1, the Ben Lomond Fault underlies the Brackney landslide area, in the southern portion of the northern pipeline segment (Figure 4.6-4). This fault has been mapped generally along the San Lorenzo River from Boulder Creek to Felton, as well as within west Santa Cruz, traversing the coastline just east of Mitchell's Cove. Although well-defined in the Brackney landslide area, this late Quaternary fault (past 130,000 years) is not well-located throughout much of the area and is not Holocene-active. As a result, the pipeline is not anticipated to be damaged as a result of direct fault displacement across the pipeline alignment (CE&G 2021c).

However, the Project alignment is located in a seismically active region of California between two major Holocene-active faults: the San Andreas Fault, located approximately 7 miles to the northeast, and the San Gregorio Fault, located approximately 9 miles to the southwest (see Figure 4.6-1). In addition, the Project site is located approximately 1 mile southwest of the Zayante-Vergeles Fault, which is mapped by the USGS as a late Pleistocene to possibly Holocene fault (past 15,000 years), and 5 miles north of the Monterey Bay-Tularcitos Fault Zone, which is generally considered late Quaternary (past 15,000 years). However, portions of the latter fault are considered Holocene-active (past 11,700 years). The presence of these active to potentially active faults in the Project region indicate that the Project may be subject to strong seismically induced ground shaking and associated ground failure, including seismically induced slope failure, differential settlement, liquefaction, and lateral spreading. The intensity of ground shaking that is likely to occur would be dependent on the magnitude of the earthquake, the distance to the epicenter, and the local rock/soil type.

Seismically induced slope failure typically occurs on steep to very steep slopes, such as those that are present in the Brackney landslide area (Figure 4.6-4). Differential settlement typically occurs in flat-lying to gently sloping areas, where variable soil densities and other factors contribute to differing amounts of settlement over a given length of ground surface. As indicated in Figure 4.6-5A and Figure 4.6-5B, portions of the northern and southern pipeline segments are in areas of moderate liquefaction potential. Lateral spreading may occur

in areas where the Proposed pipeline alignment traverses slopes and is also within an area of liquefaction prone soils. For example, a geotechnical investigation completed for the Felton Booster Pump Station, at the northern end of the southern segment (Figure 4.6-2B), concluded that the slopes adjacent to Zayante Creek have a high potential for lateral spreading in the event of a strong earthquake. Any of these types of seismically induced ground failure could damage the Proposed Project pipeline and associated appurtenances, such as air release valves.

The proposed pipeline alignment would consist of a northern segment and southern segment (Figures 4.6-2A and 4.6-2B). With the exception of the Brackney landslide area, the northern segment would be installed in open cut trenches within existing roadway, road ROWs, and/or City easements, primarily parallel to the existing pipeline. The pipeline would be installed on existing bridges across Newell Creek in two locations, replacing the existing pipeline in the same location. The structural design of the northern segment, included in the 30% Basis of Design report (Mott MacDonald 2021b), is based on an earthquake return period of 2,475 years (i.e., 2% exceedance in 50 years) and a peak ground acceleration of 0.751g (percent of gravity). The structural design includes earthquake design, based on the local geology and the maximum anticipated ground accelerations.

In the Brackney landslide area, the pipeline would be installed using horizontal directional drilling (HDD) technology. The pipeline would be installed to depths of 60 to 110 feet below ground surface, which is below the zone of incompetent rock (i.e., upper 13 to 25 feet) that is most susceptible to slope failure, including seismically induced failure. This portion of the pipeline is anticipated to withstand strong ground shaking if exposed to it during seismic events. Although the Ben Lomond Fault traverses the proposed HDD alignment, movement is not anticipated on this fault. The most recent movement on the Ben Lomond Fault occurred about 85,000 years ago. Therefore, the pipeline would not require fault offset design (Mott MacDonald 2021b).

The structural design of the southern segment, included in the 30% drawings (Appendix B) of the Basis of Design report (Carollo Engineers 2021a), is based on recommendations in a project-specific geotechnical investigation report (by Crawford and Associates). The geotechnical report included 20 new borings and a review of previous boring data by Pacific Geotechnical Engineering. The structural design includes earthquake design, based on the local geology and the maximum anticipated ground accelerations. Most of the southern segment of the pipeline would be buried in a 3- to 5-foot open cut trench. However, the pipeline would be placed on the existing bridge over Zayante Creek. The bridge has been evaluated to determine the structural adequacy in supporting the proposed pipeline. Two 30-inch diameter concrete piers would be installed at the southern abutment to provide structural support to the pipeline. In addition, the pipeline would be bored, to a depth of 10 feet over a 92-foot span, beneath a Santa Cruz Big Trees & Pacific Railway Company railroad easement, using pipe ramming or auger boring technology. Earthquake loads have been considered for each type of pipeline installation, including open cut, bridge attachment, and horizontal boring.

Proposed Project facilities would be constructed in accordance with provisions of the 2019 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist, thus minimizing the potential for damage. In addition, construction and operation of Proposed Project facilities would not increase the potential for earthquakes or seismically induced ground failure to occur, including the risk of loss, injury, or death resulting from seismic ground shaking or seismic related ground failure. Therefore, the Proposed Project would have a less-than-significant impact related to seismic hazards.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to seismic hazards, and therefore, no mitigation measures are required.

Impact GEO-2: Unstable Geologic Unit or Soils (Significance Thresholds A-iv and C). The Proposed Project could potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse. ***(Less than Significant with Mitigation)***

Northern Segment

As described in Section 3.5.2, Description of Pipeline Segments, the pipeline would cross Newell Creek and an unnamed tributary to Newell Creek on bridge and culvert crossings. Construction activities would be staged on either side of the creek, and no construction is planned in the flowing channels. As a result, no geologic impacts would occur with respect to construction across Newell Creek and the tributary creek.

Trench excavation activities would result in temporary slopes that, if not constructed properly, could be prone to failure, which in turn could result in safety impacts to construction personnel and damage to adjacent infrastructure. However, in accordance with Cal/OSHA, temporary shoring would be required to maintain slope stability for trenches greater than 5 feet deep. An exception to this rule would be if the excavation is completed entirely in stable rock, a California Geotechnical Engineer and/or California Certified Engineering Geologist may determine that protective shoring is not required. In the event the trench is greater than 5 feet deep and shoring is not feasible (e.g., due to loose crumbly soils), the temporary slopes would be laid back to a lesser gradient, in accordance with engineered design plans of the 30% Design Drawings of the Basis of Design report (Mott MacDonald 2021b), and would be constructed in accordance with provisions of the California Building Code and Cal/OSHA, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist, thereby minimizing the potential for slope failure.

Depending on the depth of the trench and the local depth to groundwater, groundwater may be encountered during trenching, which could potentially result in unstable soil conditions and associated slope failure within the trench. In the event groundwater is encountered, dewatering would be required to maintain dry working conditions. As described above, potentially unstable soils would be addressed in accordance with engineered design plans of the 30% Design Report and provisions of the California Building Code and Cal/OSHA, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist, thereby minimizing the potential for unstable soils and associated slope failure.

The open cut trenching portions of the northern segment would be completed on relatively flat to moderately sloping topography. With the exception of the Brackney North and Brackney South sections (see below), the proposed alignment would not traverse any known landslides or steep slopes that might be susceptible to failure if undercut by the trench. As previously discussed, steep creek banks would not be traversed, as the pipeline would be attached to existing bridges and placed over or under existing culverts at creek crossings, thus eliminating the potential for creek bank failure. Following pipeline installation, the trench would be backfilled, and the soil compacted to prevent subsequent ground subsidence, collapse, or settlement. Controlled low-

strength material (CLSM), consisting of a self-compacted cementitious material used primarily as a backfill in place of compacted fill, may be considered to reduce risk of long-term settlement (Mott MacDonald 2021b).

Brackney North Section

The proposed HDD method would avoid potential slope failure during construction, as opposed to the shallow open cut methods, which can create slope instability during construction. The pipeline would be installed 60 to 110 feet below ground surface, which is below the zone of incompetent rock (i.e., upper 20 to 35 feet) that is most susceptible to slope failure. As a result, the pipeline would have minimal exposure to future landslides during operations. Drilling would be completed near the intersection of Brackney Road and the existing pipeline easement, which is in a gently sloping private property, not susceptible to slope failure.

The length of existing pipeline at high risk to landslides in the Brackney Landslide area is about 1,200 linear feet. The proposed pipeline would be installed as a new 24 -inch carrier pipeline constructed by HDD technology, which would make it less susceptible to damage from landslides. No evidence of deep-seated landsliding was detected in the Brackney Landslide area. Relatively restricted shallow landsliding of colluvium and the uppermost, severely weathered bedrock appears to have been involved in the observed landslide features, which previously caused damage to the pipeline. The pipeline would be installed 60 to 110 feet below ground surface, which is below the zone of incompetent rock (i.e., upper 13 to 25 feet) that is most susceptible to slope failure. Slope stability analyses indicated that the potential for deep-seated landsliding (involving bedrock) to adversely affect the site improvements is low under static conditions (i.e., non-seismic) and low to moderate under seismic conditions. In addition, the potential for shallow-seated landsliding (under static and seismic conditions) to adversely affect the proposed site improvements is low (CE&G 2021c).

HDD can result in inadvertent drilling fluid return to the ground surface, which occurs when the fluid pressure is greater than the pressure of the surrounding ground. Topography with high relief, such as the steep slopes of the proposed alignment in the Brackney landslide area, carry higher risk of inadvertent fluid returns because there is less ground pressure resisting the fluid pressure in the horizontal direction. The closer the HDD borehole lies to the slope, the higher the risk of inadvertent returns on the slope face. For the proposed HDD option, the inadvertent fluid return risk is high, as the alignment is relatively close to the slope adjacent to the San Lorenzo River channel, considering the required drilling mud pressures and unknown underground flow paths that might be present. These flow paths could include permeable soils near the HDD exit location, highly fractured rock (e.g., the Ben Lomond Fault Zone), or open rock discontinuities (e.g., rock joints or bedding planes). Inadvertent fluid returns along the San Lorenzo River channel could erode soil and loose rock along the steep slopes. If erosion is substantial, slope destabilization could occur. While the risk of HDD operations triggering a landslide is not high, it may be possible (Mott MacDonald 2021a). As a result, impacts would be potentially significant. (See Section 4.9, Hydrology and Water Quality, Impact HYD-1 regarding HDD related water quality impacts.)

The Ben Lomond Fault traverses the pipeline alignment in the vicinity of the Brackney landslide (Figure 4.6-4). The rock in the vicinity of the fault may be fractured, potentially resulting in borehole instability. In addition, should the fault zone be clayey, it may act as an impermeable barrier that, when drilled through, produces larger groundwater flows into the borehole. Ground disturbance or loss around the pipeline could reach 10 to 30 feet radially from the pipeline alignment due to unstable ground conditions. The HDD alignment would be more than 30 feet from existing homes, at the closest point. A sinkhole could form at the ground surface where the HDD bore is not cased; primarily at relatively shallow pipeline locations at each end of the HDD

borehole (Mott MacDonald 2021a). The HDD borehole jacking shaft, receiving shaft, and staging areas for the proposed HDD route would not be adjacent to an existing residence. Regardless, a sinkhole at either end of the HDD borehole, or at any point along the HDD route, would be considered a potentially significant impact due to unforeseen impacts to overlying roads, utilities, or private property.

Brackney South Section

South of Brackney Road in the Brackney South section, the depth to bedrock varies but is generally much greater than in the Brackney North section, estimated on the order of 30 feet, but may be greater in some locations. The potential exists for deeper-seated landslides through most or all the soil mass above the bedrock. These greater depths preclude the approach of installing a replacement pipeline in a deepened trench that extends into the bedrock or micro-tunneling that would require tunneling the pipeline on an order of 50 feet. through this area. For the area of potential landslides in the Brackney South section, incorporation of slope stability measures detailed in Section 3.6.2.3, Construction Methods in Brackney South section, would minimize the potential for slope failure. As a result, the Brackney South section of the northern segment would not result in potentially significant impacts related to unstable geologic units or soils. Impacts would be less than significant.

Southern Segment

The proposed trenchless construction method for installation of the pipeline under the Santa Cruz Big Trees & Pacific Railway Company railroad easement, as opposed to open cut methodology, would reduce the potential for long-term settlement beneath the railroad (Carollo Engineers 2021b). Several areas along the Graham Hill Road North section of the southern segment, including sections in the San Lorenzo Lumber Yard and Henry Cowell Redwoods State Park, are steeply sloped. There is a risk of leakage at segments that are steeply sloped due to high pressure from the injected material at the lowest end of the pipe segment. To reduce the risk of leakage during abandonment, the pipeline will be injected using specified design criteria (Carollo 2021a).

Potential slope stability impacts during trenching in the southern segment would be the same as that described for the northern segment. The structural design of the southern segment, included in the 30% drawings (Carollo Engineers 2021a), is based on recommendations in a project-specific geotechnical investigation report (by Crawford and Associates). The geotechnical report included 20 new borings and a review of previous boring data by Pacific Geotechnical Engineering. The southern segment would be constructed in accordance with provisions of the California Building Code and Cal/OSHA, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist, thereby minimizing the potential for slope failure.

The open cut trenching portions of the southern segment would be completed on relatively flat to gently sloping topography. The proposed alignment would not traverse any known landslides or steep slopes that might be susceptible to failure if undercut by the trench. As previously discussed, steep creek banks would not be traversed, as the pipeline would be attached to an existing bridge and culvert crossing at creek crossings, thus eliminating the potential for creek bank failure. Following pipeline installation, the trench would be backfilled, and the soil compacted to prevent subsequent ground subsidence, collapse, or settlement.

As a result, construction and operation of the southern segment would not result in potentially significant impacts related to unstable geologic units or soils. Impacts would be less than significant.

Wildfire-Induced Debris Flows

Post-wildfire landslide hazards include fast-moving, highly destructive debris flows that can occur in the years immediately after wildfires in response to high intensity rainfall events accompanied by root decay and loss of soil strength. Post-fire debris flows are particularly hazardous because such flows can occur with little warning, can exert great impulsive loads on objects in their paths, and can strip vegetation, block drainages, damage structures, and endanger human life. Wildfires could also potentially result in the destabilization of pre-existing deep-seated landslides over long time periods (USGS 2021).

The 2020 C.Z.U. Lightning Complex Fire burned 86,000 acres, including large areas of Santa Cruz County. The burn areas are susceptible to debris flows in the event of an intense precipitation event. The County of Santa Cruz has prepared a debris flow map, delineating areas of potential debris flows in the burn areas. Based on this map, which covers the Proposed Project alignment, except for the southern approximate 0.5 mile of the southern segment, no debris flow hazards have been identified along the alignment (County of Santa Cruz 2021). Therefore, the NCP alignment would not be susceptible to impacts associated with debris flows. Impacts would be less than significant.

Mitigation Measures

Implementation of the Mitigation Measures GEO-1 and GEO-2 would reduce potentially significant impacts related to ground subsidence, soil collapse, erosion, and slope instability, as described above, to a less-than-significant level.

MM GEO-1: **HDD Geologic Monitoring (Applicable to Brackney North section).** A California Certified Engineering Geologist (CEG) or Registered Geotechnical Engineer (RGE) shall monitor horizontal directional drilling (HDD) operations for potential ground subsidence or soil collapse along the HDD alignment. In the event that ground subsidence or soil collapse is observed, HDD operations shall cease pending completion of remedial measures. Remedial measures shall include adjustments to drilling operations to preclude additional ground failure, as well as remedial measures to repair the area of ground failure.

MM GEO-2: **HDD Inadvertent Fluid Return Plan (Applicable to Brackney North section).** An inadvertent fluid return contingency plan shall be prepared and implemented, including measures for training, monitoring, worst-case scenario evaluation, equipment and materials, agency notification and prevention, containment, clean up, and disposal of released drilling mud. Site-specific contingency measures shall be developed for the proposed HDD alignment, taking into consideration terrain, access, resource sensitivities, and proximity of suitable areas for staging inadvertent fluid return equipment. Preventative measures would include incorporation of recommendations by a geotechnical engineer, based on geotechnical investigations, to determine the most appropriate drilling mud mixture and drilling pressures. Drilling pressures shall be closely monitored by a CEG or RGE such that those pressures do not exceed pressures required to penetrate the rock formation. Monitoring by a minimum of two monitors, which could include the CEG or RGE, shall occur throughout drilling operations to ensure swift response in the event of inadvertent fluid return. In the event of inadvertent fluid return and if containment becomes necessary, containment shall be accomplished through construction of temporary berms/dikes and use of silt fences, straw bales, absorbent pads, straw wattles, and

plastic sheeting. Any required clean up shall be accomplished with plastic pales, shovels, and portable pumps. The inadvertent fluid return contingency plan shall be submitted to the City for review and approval.

Impact GEO-3: Expansive Soils (Significance Threshold D). The Proposed Project would potentially be located on expansive soil, as defined in the 2019 California Building Code, but would not create substantial direct or indirect risks to property. ***(Less than Significant)***

As previously discussed, the Project alignment is underlain primarily by Monterey Shale, Lompico Sandstone, and Santa Margarita Sandstone with overlying surficial deposits of alluvium, colluvium, topsoil, and fill. The overlying surficial deposits may locally be clay-rich and susceptible to soil expansion. Swelling and contracting of expansive soils within the proposed pipeline trench could result in damage to the pipeline. However, in accordance with provisions of the 2019 California Building Code, expansive soils would be identified either pre-construction or during construction, through standard geotechnical sampling and analysis. Remedial methods typically employed in areas of expansive soils includes placing the pipe on a bed of nonexpansive, granular sand; using chemical stabilization, such as a bed of lime; or stabilizing the soil with polymeric materials (i.e., geosynthetics). Utilizing these standard construction techniques would reduce the potential for expansive soils to damage the proposed pipeline. In addition, pipeline construction and operation would not cause or exacerbate the potential for soil expansion to occur. Therefore, the Proposed Project would have less-than-significant impacts related to expansive soils.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to expansive soils, and therefore, no mitigation measures are required.

Impact GEO-4: Paleontological Resources (Significance Threshold F). The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature. ***(Less than Significant with Mitigation)***

As discussed above, the Proposed Project site is underlain by the middle Miocene Lompico Sandstone, middle to late Miocene Monterey Formation (or Monterey Shale), upper Miocene Santa Margarita Sandstone, and Quaternary alluvium and is not anticipated to be underlain by a unique geological feature. The Lompico Sandstone, Monterey Formation, and Santa Margarita Sandstone have produced scientifically significant fossils and are considered to have high paleontological resources sensitivity per the SVP (2010) mitigation guidelines. The LACM did not report any vertebrate fossil localities from within the Project site but did have nearby localities from the Santa Margarita Sandstone. In addition, a review of the paleontological literature indicated the Lompico Sandstone, Monterey Formation, and Santa Margarita Sandstone have yielded abundant invertebrate and vertebrate fossil remains in California.

Any significant grading, excavations, trenching, or augering that is below the depth of topsoil, if present, could potentially result in disturbance of paleontological resources. Such disturbance of paleontological resources during construction of the Proposed Project could result in significant impacts. Proposed Project pipe sections that are located within sensitive formations include:

- Northern segment: Newell Creek Road section, and portions of the Glen Arbor Road, Brackney North and Brackney South sections
- Southern segment: Graham Hill Road North section

The Proposed Project does not include grading, and the majority of the Proposed Project would not involve substantial excavation for installation of the new pipeline. The majority of the Proposed Project would be installed using conventional (open cut) trenching methods, except in the Brackney North and potentially Brackney South sections, as well as under the existing rail crossing in the Graham Hill Road North section, where trenchless methods would be used. Except as noted above, the Proposed Project generally would be constructed within existing road pavement, road right-of-way and/or existing City easements, primarily in areas that have been previously disturbed for road installation and maintenance. The standard pipeline construction trench would be approximately 4 to 5 feet wide with varying depths to avoid existing utilities under paved roadways, but generally would be a minimum of 5 feet deep.

Mitigation Measures

Implementation of the Mitigation Measures GEO-3 would reduce potentially significant impacts related to paleontological resources, as described above, to a less-than-significant level.

MM GEO-3: **Paleontological Resources Impact Mitigation Program and Paleontological Monitoring (Applicable to Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, and Graham Hill Road North sections).** Prior to commencement of any trenching activity on site, the City shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) (2010) guidelines. The paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the Proposed Project. The PRIMP shall be consistent with the SVP (2010 or most current version) guidelines and outline requirements for preconstruction meeting attendance and worker environmental awareness training; paleontological monitoring as required based on geological mapping, construction plans, and/or geotechnical reports; procedures for adequate paleontological monitoring and discoveries treatment; paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils); reporting; and collections management. The qualified paleontologist shall attend the preconstruction meeting and a qualified paleontological monitor shall be on site during all trenching and other significant ground-disturbing activities (including augering) in previously undisturbed, Lompico Sandstone, Monterey Formation, and Santa Margarita Sandstone deposits, as defined by the PRIMP. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

4.6.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative geology and soils impacts associated with the Proposed Project and past, present, and reasonably foreseeable future Projects, as identified in Table 4.0-1 in Section

4.0, Introduction to Analysis, and as relevant to this topic. The geographic area considered in the cumulative analysis for geology, soils, and paleontological resources is generally the vicinity of the Project alignment.

The Proposed Project would not contribute to cumulative impacts related to earthquake fault rupture (Significance Threshold A-i) or septic tanks/alternative wastewater disposal (Significance Threshold E) because it would have no impacts related to these thresholds, as described above. Therefore, these significance thresholds are not further evaluated. Erosion-related cumulative impacts (Significance Threshold B) are addressed in Section 4.9, Hydrology and Water Quality.

Impact GEO-5: Cumulative Geologic Hazards (Significance Thresholds A-ii, A-iii, A-iv, C, and D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to geology and soils. ***(Less than Significant)***

Known cumulative Projects planned within the vicinity of the Project alignment include the Santa Cruz Water Rights Project, Felton Diversion Pump Station Assessment, Newell Creek Dam Inlet/Outlet Replacement Project, GHWTP Tube Settlers Replacement Project, GHWTP Flocculator Rehab/Replacement Project, GHWTP Concrete Tanks Project, and GHWTP Facility Improvement Project. Projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to geology and soils. Furthermore, potential cumulative impacts on geological, seismic, and soil conditions would be reduced on a site-by-site basis by modern construction methods and compliance with California Building Code regulatory requirements that ensure building safety. Additionally, cumulative projects would be required to prepare and submit a site-specific geotechnical report for review and approval prior to the issuance of grading or building permits. Therefore, cumulative projects would not result in a significant cumulative impact related to geology and soils. Furthermore, as described in the analysis above, Proposed Project impacts would be localized and would not result in construction (including excavation or tunneling) or design features which could directly or indirectly contribute to an increase in a cumulative geological hazard. The Proposed Project would not cumulatively alter geological conditions or features.

Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the Project vicinity, would not result in significant cumulative impacts related to geological hazards.

Impact GEO-6: Cumulative Paleontological Resources Impacts (Significance Threshold F). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to paleontological resources. ***(Less than Significant)***

Potential cumulative impacts on paleontological resources could result from known or unknown Projects that combine to create an environment where fossils, exposed on the surface, are vulnerable to destruction by earthmoving equipment, looting by the public, and natural causes such as weathering and erosion. The majority of impacts to paleontological resources are site-specific and are therefore generally mitigated on a project-by-project basis. Additionally, as needed, projects would incorporate individual mitigation for site-specific geological units present on each individual Project site. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects in the Project vicinity, would not result in a significant cumulative impacts to paleontological resources. Furthermore, the mitigation

measures provided in this analysis are prescribed to preserve significant paleontological resources uncovered during Project excavations by proper analysis and salvaging by the on-site paleontological monitor.

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4.7 Greenhouse Gas Emissions

This section describes the existing greenhouse gas (GHG) conditions of the Proposed Project sites and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on GHG modeling conducted for the Proposed Project as part of the preparation of this environmental impact report (EIR). The results of the GHG modeling are summarized in this section and are included in Appendix E.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to GHG emissions.

4.7.1 Existing Conditions

4.7.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate—such as temperature, precipitation, or wind patterns—lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (U.S. Environmental Protection Agency [EPA] 2017).

The greenhouse effect is the trapping and buildup of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a three-part process as follows: (1) short-wave radiation emitted by the Sun is absorbed by the Earth, (2) the Earth emits a portion of this energy in the form of long-wave radiation, and (3) GHGs in the upper atmosphere absorb this long-wave radiation and emit it both into space and back toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. However, recent climate changes, in particular the warming observed over the past century, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of warming since the mid-twentieth century, and are the most significant driver of observed climate change (Intergovernmental Panel on Climate Change [IPCC] 2013; EPA 2017). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil

fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system.

4.7.1.2 Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g), for purposes of administering many of the State's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (see also see also 14 California Code of Regulations [CCR] Section 15364.5).[1] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are the predominant GHGs emitted from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[2]

Carbon Dioxide

CO_2 is a naturally occurring gas and a by-product of human activities; it is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 include the combustion of fuels such as coal, oil, natural gas, and wood, and changes in land use.

Methane

CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. CH_4 is produced through anaerobic (i.e., without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide

N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (such as in rockets, racecars, and aerosol sprays).

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1 Climate-forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in California Health and Safety Code, Section 38505. Impacts associated with other climate-forcing substances are not evaluated herein.

2 The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change's Second Assessment Report and Fourth Assessment Report (IPCC 1995, 2007), The California Air Resources Board's (CARB's) Glossary of Terms Used in GHG Inventories (CARB 2020), and EPA's Glossary of Climate Change Terms (EPA 2016).

Fluorinated Gases

Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone (O_3)-depleting substances (e.g., chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to O_3-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced, along with HFCs, as alternatives to the O_3-depleting substances. The two main sources of PFCs are primarily aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** Nitrogen trifluoride is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

Chlorofluorocarbons

CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O_3.

Hydrochlorofluorocarbons

HCFCs are a large group of compounds whose structure is very close to that of CFCs—containing fluorine, chlorine, and carbon atoms—but also including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon

Black carbon is a component of fine particulate matter ($PM_{2.5}$), which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation; influences cloud formation; and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived substance that varies spatially, which makes it difficult to quantify its global warming potential (GWP). Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants that have been regulated and controlled in California for several decades to protect public health.

Water Vapor

The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone

Tropospheric O_3, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O_3, which is created by the interaction between solar ultraviolet radiation and molecular oxygen, plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O_3, which occurs due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

4.7.1.3 Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2017). The Intergovernmental Panel on Climate Change (IPCC) developed the GWP concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2e).

The current version of the California Emissions Estimator Model (CalEEMod) (Version 2020.4.0) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the IPCC's Fourth Assessment Report (IPCC 2007).

4.7.1.4 Greenhouse Gas Inventories and Climate Change Conditions

Greenhouse Gas Inventories

Global Inventory. Anthropogenic GHG emissions worldwide in 2019 (the most recent year for which data is available) totaled approximately 52,400 million metric tons (MMT) of CO_2e, excluding land use change and forestry (PBL 2020). The top six GHG emitters include China, the United States, the Russian Federation, India, Japan, and the European Union, which accounted for approximately 62% of the total global emissions, or

approximately 32,500 MMT CO_2e (PBL 2020). Table 4.7-1 presents the top GHG-emissions-producing countries.

Table 4.7-1. Six Top Greenhouse-Gas-Producers

Emitting Countries (listed in order of emissions)	Greenhouse Gas Emissions (MMT CO_2e)
China	14,000
United States	6,600
European Union	4,300
India	3,700
Russian Federation	2,500
Japan	1,400
Total	**32,500**

Source: PBL 2020.
Note: MMT CO_2e = million metric tons of carbon dioxide equivalent.

National Inventory. Per the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019 (EPA 2021), total United States GHG emissions were approximately 6,558.3 MMT CO_2e in 2019 (EPA 2021). The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 80.1% of total GHG emissions (5,255.8 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 92.4% of CO_2 emissions in 2019 (4,856.7 MMT CO_2e). Relative to 1990, gross United States GHG emissions in 2019 were 1.8% higher; however, the gross emissions were down from a high of 15.6% above 1990 levels in 2007. GHG emissions decreased from 2018 to 2019 by 1.7% (113.1 MMT CO_2e) and overall, net emissions in 2019 were 13% below 2005 levels (EPA 2021).

State Inventory. According to California's 2000–2019 GHG emissions inventory (2021 edition), California emitted approximately 418 MMT CO_2e in 2019, including emissions resulting from out-of-state electrical generation (CARB 2021a). The sources of GHG emissions in California include transportation, industry, electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high-GWP substances, and recycling and waste. Table 4.7-2 presents California GHG emission source categories and their relative contributions to the emissions inventory in 2019.

Local Inventories. The City of Santa Cruz (City) developed a GHG inventory for multiple years as part of its *Climate Action Plan* (CAP) (City of Santa Cruz 2012). The most recent year included is 2008, with citywide GHG emissions estimated at 351,321 MT CO_2e. The County of Santa Cruz also developed a countywide GHG inventory, which estimated that approximately 791,278 MT CO_2e were emitted during 2009 (County of Santa Cruz 2013).

Between 2000 and 2019, per-capita GHG emissions in California have dropped from a peak of 14.0 MT per person in 2001 to 10.5 MT per person in 2019, representing an approximate 25% decrease. In addition, total GHG emissions in 2019 were approximately 7 MMT CO_2e lower than 2018 emissions (CARB 2021a).

Table 4.7-2. Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)[a]	Percent of Total[a]
Transportation	166.1	39.7%
Industrial	88.2	21.1%
Electric power	58.8	14.1%
Commercial and residential	43.8	10.5%
Agriculture	31.8	7.6%
High global-warming potential substances	20.6	4.9%
Recycling and waste	8.9	2.1%
Total	**418.2**	**100%**

Source: CARB 2021a.
Notes: GHG = greenhouse gas; GWP = global warming potential; MMT CO_2e = million metric tons of carbon dioxide equivalent. Emissions reflect 2018 California GHG inventory.
[a] Totals may not sum due to rounding.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 IPCC Synthesis Report (IPCC 2014) indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, rising sea levels, and ocean acidification (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, frequency of severe weather events, and electricity demand and supply. The primary effect of global climate change has been a rise in average global tropospheric temperature. Reflecting the long-term warming trend since pre-industrial times, observed global mean surface temperature for the decade 2006–2015 was 0.87°C (1.6°F) (likely between 0.75°C [1.4°F] and 0.99°C [1.8°F]) higher than the average over the 1850–1900 period (IPCC 2018). Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. Human activities are estimated to have caused approximately 1.0°C (1.8°F) of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C (1.4°F to 2.2°F) (IPCC 2018). Global warming is likely to reach 1.5°C (2.7°F) between 2030 and 2052 if it continues to increase at the current rate (IPCC 2018).

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The Office of Environmental Health Hazard Assessment identified various indicators of climate change in California, which are scientifically based measurements that track trends in various aspects of climate change. Many indicators reveal discernible evidence that climate change is occurring in California and is having significant, measurable impacts in the state. Changes in the state's climate have been observed, including an increase in annual average air temperature with record warmth from 2012 to 2016, more frequent extreme heat events, more

extreme drought, a decline in winter chill, an increase in cooling degree days and a decrease in heating degree days, and an increase in variability of statewide precipitation (OEHHA 2018).

Warming temperatures and changing precipitation patterns have altered California's physical systems—the ocean, lakes, rivers, and snowpack—upon which the state depends. Impacts of climate on physical systems have been observed such as high variability of snow-water content (i.e., amount of water stored in snowpack), decrease in snowmelt runoff, glacier change (loss in area), rise in sea levels, increase in average lake water temperature and coastal ocean temperature, and a decrease in dissolved oxygen in coastal waters (OEHHA 2018).

Impacts of climate change on biological systems, including humans, wildlife, and vegetation, have also been observed, including climate change impacts on terrestrial, marine, and freshwater ecosystems. As with global observations, species responses include those consistent with warming: elevational or latitudinal shifts in range, changes in the timing of key plant and animal life cycle events, and changes in the abundance of species and in community composition. Humans are better able to adapt to a changing climate than plants and animals in natural ecosystems. Nevertheless, climate change poses a threat to public health as warming temperatures and changes in precipitation can affect vector-borne pathogen transmission and disease patterns in California as well as the variability of heat-related deaths and illnesses. In addition, since 1950, the area burned by wildfires each year has followed an increasing trend overall.

The California Natural Resources Agency (CNRA) has released four California Climate Change Assessments (2006, 2009, 2012, and 2018), which have addressed the following: acceleration of warming across the state, more intense and frequent heat waves, greater riverine flows, accelerating sea level rise, more intense and frequent drought, more severe and frequent wildfires, more severe storms and extreme weather events, shrinking snowpack and less overall precipitation, and ocean acidification, hypoxia, and warming. To address local and regional governments' need for information to support action in their communities, the Fourth Assessment (2018) includes reports for nine regions of the state. Key projected climate changes for the Central Coast Region (which includes Santa Cruz County where the Proposed Project is located) include the following (CNRA 2018a):

- Maximum and minimum temperatures for the Central Coast will continue to increase through the next century, with greater increases in the inland region relative to the coast. Precipitation is expected to increase slightly, but precipitation variability will increase substantially.
- The future of fog is uncertain because system feedbacks and their response to climate change are not well characterized. Fog can be intercepted by coastal zone flora (which obtain up to one-third of their moisture from fog) and can also prevent low stream flows, which can keep salmonids from desiccating during dry periods.
- Periodic El Niño events dominate coastal hazards across the Central Coast while atmospheric rivers, expected to increase, are the dominant drivers of locally extreme rainfall events.
- Recently observed and projected acceleration in sea-level rise poses a significant threat to the regions' coastal communities. Future flooding is also a serious concern.
- Estuarine systems will be affected by accelerated sea-level rise, warming of water and air, ocean acidification, and changes in runoff. Some Central Coast marshes may drown or become shallow mudflats, leading to a loss of the ecosystem services that marshes provide, including carbon sequestration.

- Many beaches will narrow considerably. As many as two-thirds will be completely lost over the next century, along with the ecosystems supported by those beaches. The landward erosion of beaches will be driven by accelerating sea-level rise combined with a lack of ample sediment, effectively drowning the beaches between the rising ocean and the backing cliffs and/or urban hardscape.
- Projected future droughts are likely to be a serious challenge to the region's already stressed water supplies.
- Water supply shortages, already common during drought, will be exacerbated. Higher temperatures may result in increases in water demand for agriculture and landscaping. Reduced surface water will lead to increases in groundwater extractions that may result in increased saltwater intrusion. Lower surface flows will lead to higher pollutant concentrations and will impact aquatic species.
- Frequent and sometimes large wildfires will continue to be a major disturbance and post-fire recovery time may be lengthened.
- Central Coast native plants are a large part of the world's floristic provinces. Plant species' responses to climate change will in general depend on the climate in which a population evolved and its own unique climate tolerances. Coastal shrubland resilience depends on climate effects to physiological responses that are modified by biotic interactions and the extent of anthropogenic land use. Grasslands closer to the coast will be less affected than interior grasslands where warming is already documented.
- Climate change outcomes for forests will depend largely on multiple abiotic drivers (increased air temperatures, altered fog patterns, changes in winter precipitation), and biotic factors (invasive species and insect and pest outbreaks).
- Terrestrial wildlife is already experiencing local extinctions. Species may have robust climate refugia in the region's mountains characterized by cooler temperatures and higher levels of precipitation.
- The aquatic life of streams and rivers is threatened by projected extreme swings from drought to floods, and exacerbated by fire and erosion that buries habitat in sediments. Climate impacts can threaten the survival of already endangered steelhead and coho salmon, and further reduce the diversity and abundance of sensitive aquatic insects.
- Impacts to the region's public health include increases in heat-related illnesses for agricultural workers, harmful particulate matter from wildfires, and an increase in ground-level O_3. Infectious/vector-borne diseases such as Valley Fever and Pacific Coast tick fever are expected to increase, and an increase in harmful algal blooms will have detrimental effects on animals and people exposed to toxins released from the algae.
- Residential electricity demand is likely to be affected by more frequent heat waves due to increases in cooling requirements, and warming temperatures are likely to affect electricity supply from gas-fired plants.
- Agricultural production is highly sensitive to climate change, including amounts, forms, and distribution of precipitation, changes in temperatures, and increased frequency and intensity of climate extremes.

4.7.2 Regulatory Framework

4.7.2.1 Federal

Energy Independence and Security Act

The Energy Independence and Security Act of 2007 (Public Law 110-140), among other key measures, would do the following, which would aid in the reduction of national GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards

In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under section 202(a) of the federal Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is the "endangerment finding."
- The administrator further found that the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act (42 United States Code Section 7401).

In 2007, in response to the *Massachusetts v. EPA* U.S. Supreme Court ruling, the Bush Administration issued Executive Order (EO) 13432 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012 through 2016 (75 Federal Register [FR] 25324–25728).

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017 through 2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO_2 in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017 through 2021 (77 FR 62624–63200). On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014 through 2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6% to 23% over the 2010 baselines (76 FR 57106–57513).

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

On April 2, 2018, the EPA, under administrator Scott Pruitt, reconsidered the final determination for light-duty vehicles and withdrew its previous 2017 determination, stating that the current standards may be too stringent and therefore should be revised as appropriate (EPA 2019).

In August 2018, EPA and NHTSA proposed to amend certain fuel economy and GHG standards for passenger cars and light trucks and establish new standards for model years 2021 through 2026. Compared to maintaining the post-2020 standards then in place, the 2018 proposal would increase U.S. fuel consumption by about half a million barrels per day (2% to 3% of total daily consumption, according to the Energy Information Administration) and would impact the global climate by 3/1000th of one degree Celsius by 2100 (EPA and NHTSA 2018). California and other states have stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives.

On September 27, 2019, the EPA and NHTSA published the SAFE Vehicles Rule Part One: One National Program (84 FR 51310), which became effective November 26, 2019. The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. On March 31, 2020, the EPA and NHTSA issued the Part Two Rule, which went into effect 60 days after being published in the Federal Register. The Part Two Rule sets CO_2 emissions standards and corporate average fuel economy standards for passenger vehicles and light-duty trucks for model years 2021 through 2026. On January 20, 2021, President Joe Biden issued an EO on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, which includes review of Part One Rule by April 2021 and review of the Part Two Rule by July 2021 (The White House 2021).

4.7.2.2 State

The statewide GHG emissions regulatory framework applicable to the Proposed Project is summarized in this subsection by category: state climate change targets, renewable energy and energy procurement, mobile sources, and other state actions. The following text describes EOs, Assembly Bills (ABs), Senate Bills (SBs), and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

The state has taken a number of actions to address climate change. These actions are summarized below, and include EOs, legislation, and CARB plans and requirements.

Executive Order S-3-05

EO S-3-05 (June 2005) established California's GHG emissions-reduction targets and laid out responsibilities among the state agencies for implementing the EO and for reporting on progress toward the targets. This EO established the following targets:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80% below 1990 levels

EO S-3-05 also directed the California Environmental Protection Agency to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry.

Executive Order B-30-15

EO B-30-15 (April 2015) identified an interim GHG-reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050, as set forth in S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the Scoping Plan to express the 2030 target in terms of MMT CO_2e. The EO also called for state agencies to continue to develop and implement GHG emission-reduction programs in support of the reduction targets.

Executive Order B-55-18

EO B-55-18 (September 2018) establishes a statewide policy for the state to achieve carbon neutrality as soon as possible (no later than 2045), and achieve and maintain net negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the state's GHG emissions. CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Assembly Bill 32

In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32, the California Global Warming Solutions Act of 2006 (California Health and Safety Code Sections 38500-38599 et seq.). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020, and initiate the transformations required to achieve the state's long-range climate objectives.

Senate Bill 32 and Assembly Bill 197

SB 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions-reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to the Board as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions-reduction measures when updating the scoping plan.

California Air Resources Board's Climate Change Scoping Plan

One specific requirement of AB 32 is for CARB to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (California Health and Safety Code Section 38561[a]), and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan: The *Climate Change Proposed Scoping Plan: A Framework for Change* (Scoping Plan). The Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission-reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives.

In 2014, CARB approved the first update to the Scoping Plan. The *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update) defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in EOs S-3-05 and B-16-2012 (CARB 2014). The First Update concluded that California was on track to meet the 2020 target, but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050 including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

In December 2017, CARB released the *2017 Climate Change Scoping Plan Update* (Second Update) for public review and comment (CARB 2017a). The Second Update builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new technologically feasible and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable

energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, the Second Update recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%. The Second Update was approved by CARB's Governing Board on December 14, 2017.[3]

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and the EOs; it also establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and EOs if it would meet the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and would not impede attainment of those goals.

California Air Resources Board's Regulations for the Mandatory Reporting of Greenhouse Gas Emissions

CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (17 CCR Sections 95100–95157) incorporated by reference certain requirements that EPA promulgated in its Final Rule on Mandatory Reporting of Greenhouse Gases (40 Code of Federal Regulations Section 98). Specifically, Stion 95100(c) of the Mandatory Reporting Regulation incorporated those requirements that EPA promulgated in the *Federal Register* on October 30, 2009; July 12, 2010; September 22, 2010; October 28, 2010; November 30, 2010; December 17, 2010; and April 25, 2011. In general, entities subject to the Mandatory Reporting Regulation that emit over 10,000 MT CO_2e per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 MT CO_2e per year threshold are required to have their GHG emissions report verified by a CARB-accredited third-party.

Executive Order B-18-12

EO B-18-12 (April 2012) directed state agencies, departments, and other entities under the Governor's executive authority to take action to reduce entity-wide GHG emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline. EO B-18-12 also established goals for existing state buildings for reducing grid-based energy purchases and water use.

Senate Bill 605 and Senate Bill 1383

SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants (SLCPs) in the state (California Health and Safety Code Section 39730); and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018 (California Public Resources Code [PRC] Section 42652-43654). SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for CH_4 and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its *Short-Lived Climate Pollutant Reduction Strategy* (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, methane, and fluorinated gases (CARB 2017b).

[3] Notably, the 2022 Scoping Plan Update – Achieving Carbon Neutrality by 2045, is currently under development.

Renewable Energy and Energy Procurement

Senate Bill 1078

SB 1078 (2002) (California Public Utilities Code Section 399.11 et seq.) established the Renewables Portfolio Standard (RPS) program, which required an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010 (see SB 107, EO S-14-08, and EO S-21-09).

Senate Bill 1368

SB 1368 (2006), required the CEC to develop and adopt regulations for GHG emission performance standards for the long-term procurement of electricity by local publicly owned utilities (California Public Utilities Code Section 8340-8341 et seq.). These standards must be consistent with the standards adopted by the California Public Utilities Commission (CPUC).

Executive Order S-14-08

EO S-14-08 (2008) focused on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. This EO required that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the EO directed state agencies to take appropriate actions to facilitate reaching this target. The CNRA, through collaboration with CEC and the California Department of Fish and Wildlife, was directed to lead this effort.

Executive Order S-21-09 and Senate Bill X1-2

EO S-21-09 (2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08 by July 31, 2010. CARB was further directed to work with CPUC and CEC to ensure that the regulation builds upon the RPS program and was applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB was to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health, and those that can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB initially approved regulations to implement a Renewable Electricity Standard; however, this regulation was not finalized because of subsequent legislation (SB X1-2) signed by Governor Brown in April 2011.

SB X1-2 expanded RPS by establishing a renewable energy target of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation (30 megawatts or less), digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

SB X1-2 applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet the renewable energy goals listed above.

Senate Bill 350

SB 350 (2015) further expanded the RPS program by establishing a goal of 50% of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 included the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

Senate Bill 100

SB 100 (2018) increased the standards set forth in SB 350, establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources do not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Mobile Sources

State Vehicle Standards (Assembly Bill 1493 and Executive Order B-16-12)

AB 1493 (July 2002) was enacted in a response to the transportation sector accounting for more than half of California's CO_2 emissions. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. EO B-16-12 (March 2012) required that state entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emissions vehicles. It ordered CARB, CEC, CPUC, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to help achieve benchmark goals by 2015, 2020, and 2025. On a statewide basis, EO B-16-12 established a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050. This directive did not apply to vehicles that have special performance requirements necessary for the protection of the public safety and welfare. As explained under the "Federal Vehicle Standards" description above, EPA and NHTSA approved the SAFE Vehicles Rule Part One and Two, which revoked California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. As the EPA rule is the subject of pending legal challenges and no GHG adjustment factors have been issued for EMFAC by CARB, this analysis continues to utilize the best available information at this time, as set forth in EMFAC.

Heavy-Duty Diesel

CARB adopted the final Heavy-Duty Truck and Bus Regulation on December 31, 2014 to reduce diesel particulate matter, a major source of black carbon, and oxides of nitrogen emissions from heavy-duty diesel vehicles (13 CCR Section 2025). The rule requires diesel particulate matter filters be applied to newer heavier

trucks and buses by January 1, 2012, with older vehicles required to comply by January 1, 2015. The rule will require nearly all diesel trucks and buses to be compliant with the 2010 model year engine requirement by January 1, 2023. CARB also adopted an Airborne Toxic Control Measure to limit idling of diesel-fueled commercial vehicles on December 12, 2013. This rule requires diesel-fueled vehicles with gross vehicle weights greater than 10,000 pounds to idle no more than 5 minutes at any location (13 CCR Section 2485).

Executive Order S-1-07

EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR Section 95480 et seq.). The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel—including extraction/feedstock production, processing, transportation, and final consumption—per unit of energy delivered.

Senate Bill 375

SB 375 (California Government Code Section 65080) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG-reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every 8 years. SB 375 requires the state's 18 regional metropolitan planning organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan that will achieve the GHG-reduction targets set by CARB. If an MPO is unable to devise an SCS to achieve the GHG-reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG-reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

A SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it (California Government Code Section 65080[b][2][K]). Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process. See Section 4.7.2.3, Regional, for information about the implementation of SB 375 in the Monterey Bay Area.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program

The Advanced Clean Cars program (January 2012) is an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2012). To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that in 2025, cars will emit 75% less smog-forming pollution as compared to 2014 levels. To reduce GHG emissions, CARB, in conjunction with the EPA and the NHTSA, adopted new GHG standards for model year 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% in 2025. The zero-emission vehicle program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of zero-emission

vehicles and plug-in hybrid EVs in the 2018 to 2025 model years. However, as detailed previously, EPA and NHTSA published the SAFE Vehicles Rule, which revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. The effect of the SAFE Rule on the Advanced Clean Cars program is still to be determined pending the ruling of ongoing litigation.

Executive Order N-79-20

EO N-79-20 (September 2020) directs CARB to develop and propose regulations that would require a ramp up to 100% in-state sales of new zero-emission passenger vehicles (cars and trucks) and drayage trucks by 2035. EO N-79-20 further directs CARB to promulgate regulations that would require a ramp up to 100% in-state sales of medium- and heavy-duty trucks by 2045 "for all operations where feasible." Here, unlike with passenger cars, EO N-79-20 does not narrow its mandate to a prohibition on the sale of new medium- and heavy-duty trucks. EO N-79-20 also instructs CARB to develop and propose strategies (as opposed to regulations) to achieve zero emissions from off-road vehicles and equipment operations in the state by 2035.

Advanced Clean Trucks Regulation

The Advanced Clean Trucks (ACT) Regulation was also approved by CARB in 2020. The purpose of the ACT Regulation is to accelerate the market for zero-emission vehicles in the medium- and heavy-duty truck sector and to reduce air pollutant emissions generated from on-road mobile sources (CARB 2021b). The regulation has two components including (1) a manufacturer sales requirement and (2) a reporting requirement:

1. Zero-emission truck sales: Manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines will be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales.
2. Company and fleet reporting: Large employers including retailers, manufacturers, brokers and others will be required to report information about shipments and shuttle services. Fleet owners, with 50 or more trucks, will be required to report about their existing fleet operations. This information will help identify future strategies to ensure that fleets purchase available zero-emission trucks and place them in service where suitable to meet their needs.

Water

Senate Bill X7-7

SB X7-7, or the Water Conservation Act of 2009, required that all water suppliers increase their water use efficiency with an overall goal of reducing per capita urban water use by 20% by December 31, 2020. Each urban water supplier was required to develop water use targets to meet this goal.

Executive Order B-29-15

In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the

state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Executive Order B-37-16

Issued May 2016, EO B-37-16 directs the State Water Resources Control Board (SWRCB) to adjust emergency water conservation regulations through the end of January 2017 to reflect differing water supply conditions across the state. The SWRCB must also develop a proposal to achieve a mandatory reduction of potable urban water usage that builds off the mandatory 25% reduction called for in EO B-29-15. The SWRCB and Department of Water Resources will develop new, permanent water use targets that build upon the existing state law requirements that the state achieve a 20% reduction in urban water usage by 2020. EO B-37-16 also specifies that the SWRCB will permanently prohibit water-wasting practices such as hosing off sidewalks, driveways, and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and irrigating ornamental turf on public street medians.

Executive Order N-10-21

In response to a state of emergency due to severe drought conditions, EO N-10-21 (July 2021) called on all Californians to voluntarily reduce their water use by 15% from their 2020 levels. Actions suggested in EO N-10-21 include reducing landscape irrigation, running dishwashers and washing machines only when full, finding and fixing leaks, installing water-efficient showerheads, taking shorter showers, using a shut-off nozzle on hoses, and taking cars to commercial car washes that use recycled water.

Other State Actions

Senate Bill 97

SB 97 (2007) directed the Governor's Office of Planning and Research and the CNRA to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor's Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines, a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR Section 15064.4[a]). The CEQA Guidelines require a lead agency to consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR Section

15064.4[b]). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures (14 CCR Section 15126.4[c]). The adopted amendments do not establish a GHG emission threshold, instead allowing a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledged that a lead agency could consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009b).

With respect to GHG emissions, CEQA Guidelines Section 15064.4(a), as subsequently amended in 2018, states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines now note that an agency "shall have discretion to determine, in the context of a particular project, whether to: (1) [q]uantify greenhouse gas emissions resulting from a project; and/or (2) [r]ely on a qualitative analysis or performance based standards" (14 CCR Section 15064.4[a]). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: (1) the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR Section 15064.4[b]).

Executive Order S-13-08

EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the EO directs state agencies to take specified actions to assess and plan for such impacts. The final *2009 California Climate Adaptation Strategy* report was issued in December 2009 (CNRA 2009a), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: Agriculture, Biodiversity and Habitat, Emergency Management, Energy, Forestry, Ocean and Coastal Ecosystems and Resources, Public Health, Transportation, and Water. Issuance of the *Safeguarding California: Implementation Action Plans* followed in March 2016 (CNRA 2016). In January 2018, the CNRA released the *Safeguarding California Plan: 2018 Update,* which communicates current and needed actions that state government should take to build climate change resiliency (CNRA 2018b).

4.7.2.3 Regional

Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is the designated MPO for the Monterey Bay region. The AMBAG region includes Monterey, San Benito, and Santa Cruz counties. CARB has set the latest SB 375 GHG-reduction targets for the Monterey Bay Area at 3% decrease from 2005 per capita emissions by 2020, and 6% below 2005 per capita emissions by 2035. In June 2018, AMBAG adopted *Moving Forward Monterey Bay 2040* (2040 MTP/SCS), the implementation of which was anticipated to achieve a 4%-per-capita reduction in GHG emissions from passenger vehicles by 2020, as well as a projected reduction in GHG emissions of nearly 7%-per-capita from passenger vehicles by 2035 (AMBAG 2018). The 2040 MTP/SCS outlines the region's proposed transportation network, emphasizing multimodal system enhancements,

system preservation, and improved access to high quality transit, as well as land use development that complements this transportation network (AMBAG 2018).

Monterey Bay Air Resources District

California has 35 Air Pollution Control Districts and Air Quality Management Districts, many of which are currently addressing climate change issues by developing significance thresholds, performance standards, and mitigation measures. The Monterey Bay Air Resources District (MBARD) is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the North Central Coast Air Basin, where the Proposed Project is located.

4.7.2.4 Local

City of Santa Cruz Climate Action Plan

In October 2012, the City adopted a CAP that outlines the actions the City will take over 10 years to reduce GHGs by 30% and to implement the policies and actions identified in the *General Plan 2030*. The CAP addresses citywide GHG reduction strategies. The CAP provides City emissions inventories, identifies an emissions reduction target for the year 2020, and includes measures to reduce energy use, reduce vehicle trips, implement water conservation programs, reduce emissions from waste collection, increase use of solar systems, and develop public partnerships to aide sustainable practices. Measures are outlined for the following sectors: municipal, residential, commercial, and community programs. None of the recommended measures are applicable to the Proposed Project. The City is currently in the process of updating the CAP.

County of Santa Cruz Climate Action Strategy

The County of Santa Cruz Board of Supervisors approved the Climate Action Strategy (CAS) on February 26, 2013 (County of Santa Cruz 2013). The CAS reports the results of the GHG emissions inventory for Santa Cruz County, proposes targets for GHG reduction, outlines strategies and implementing actions to achieve the targets, and provides a vulnerability assessment and strategies for adapting to the types of impacts that are likely to occur in Santa Cruz County. Eight “climate adaptation goals” are articulated as a guide for evaluating adaptation strategies. Specific adaptation strategies are proposed that include new actions as well as acknowledgement of existing plans and programs, which, while not explicitly about climate change, address the salient issues. There are no goals, strategies, or recommendations applicable to the Proposed Project.

4.7.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to GHG emissions. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project’s impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.7.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to GHG emissions are based on Appendix G of the CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

B. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As described previously in Section 4.7.2.3, Regional, the Proposed Project is located within the North Central Coast Air Basin under the jurisdiction of the MBARD, which, to date, has not adopted significance criteria or thresholds for land use projects. The MBARD-adopted significance threshold of 10,000 MT of CO_2e for stationary source projects (MBARD 2016), does not apply to the Proposed Project, as no new stationary sources of GHG emissions are proposed. In the absence of an adopted numeric threshold by the MBARD, the Proposed Project was evaluated according to CEQA Guidelines Section 15064.7(c) by considering whether GHG emissions of the Proposed Project meet the 900 MT CO_2e per year screening level threshold identified by the California Air Pollution Control Officers Association (CAPCOA) (CAPCOA 2008). The 900 MT CO_2e per year threshold was developed based on various land use densities and future discretionary project types to determine the size of projects that would likely have a less than cumulatively considerable contribution to climate change. The CAPCOA threshold was developed to ensure capture of 90% or more of likely future discretionary developments with the objective to set the emissions threshold low enough to capture a substantial fraction of future development while setting the emission threshold high enough to exclude small development projects that would contribute a relatively small fraction of cumulative statewide GHG emissions. CAPCOA's 900 MT CO_2e per year threshold was developed to meet the target identified by AB 32 of reducing emissions to 1990 levels by year 2020. Subsequent to CAPCOA identifying the 900 MT CO_2e per year threshold, SB 32 was passed and set a revised statewide reduction target to reduce emissions to 40% below 1990 levels by year 2030. Though the CAPCOA threshold does not consider the reduction targets set by SB 32, the CAPCOA threshold was developed with an aggressive project-level GHG emission capture rate of 90%. Due to the aggressive GHG emission capture rate, the CAPCOA threshold has been determined to be a viable threshold to reduce project GHG emissions and meet SB 32 targets beyond 2020. Furthermore, more stringent state legislative requirements such as Building Energy Efficiency Standards and transportation-related efficiency measures will act to reduce future project GHG emissions and help in meeting State emissions reduction targets. Projects that generate emissions beyond the 900 MT CO_2e per year screening level threshold are required to implement feasible on-site mitigation measures to reduce their impacts on climate change. Projects that meet or fall below CAPCOA's screening level threshold of 900 MT CO_2e per year of GHG emissions require no further analysis and are not required to implement mitigation measures to reduce GHG emissions. As such, the CAPCOA threshold of 900 MT CO_2e per year is used as a quantitative threshold for the analysis of impacts related to GHG emissions generated by the Proposed Project.

4.7.3.2 Analytical Methods

Construction

Emissions from the construction phase of the Proposed Project were estimated using California Emissions Estimator Model (CalEEMod) Version 2020.4.0. Construction of the Proposed Project would result in GHG emissions primarily associated with use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. The analysis of GHG emissions used the same methodology and modeling inputs assumptions as the analysis of air quality impacts in Section 4.2, Air Quality, of this EIR. All details for construction criteria air pollutants discussed in Section 4.2.3.2, Analytical Methods, are also applicable for the estimation of construction-related GHG emissions. See Section 4.2.3.2 for a discussion of construction emissions calculation methodology and modeling inputs assumptions used in the GHG emissions analysis.

Operation

The Proposed Project consists of replacement of 8.75-miles of the existing NCP, as well as minor appurtenances, such as air release valves and isolation valves. Since the Proposed Project is replacing and improving existing pipeline infrastructure, once construction is complete, operations would be similar to existing conditions and would not result in an increase in on-road vehicle trips associated with routine inspection and maintenance by City staff. As such, no additional sources of GHGs are anticipated during long-term operations.

Application of Relevant Standard Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. However, there are no City Standard Construction Practices applicable to GHG emissions that are part of the Proposed Project.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event that adverse environmental impacts would occur even with consideration of applicable policies and regulations , impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.7.3.3 Project Impact Analysis

Impact GHG-1: Greenhouse Gas Emissions (Significance Threshold A). The Proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment*. (Less than Significant)*

Construction Emissions

Construction emissions associated with the Proposed Project were estimated and are depicted in Table 4.7-3. Since construction emissions are short-term, the total emissions were summed and then amortized over 30-years to represent a long-term annual emission rate. As shown in Table 4.7-3, amortized emissions associated

with construction of the Proposed Project would not exceed the significance threshold of 900 MT CO_2e per year. As such, construction GHG emissions would result in a less-than-significant impact.

Table 4.7-3. Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2022	553.33	0.09	0.01	557.71
2023	289.36	0.03	0.03	298.72
2024	673.63	0.03	0.09	702.01
2025	22.54	<0.01	<0.01	23.46
2030	285.07	0.01	0.03	292.92
2031	232.47	0.01	0.02	238.18
Total for All Years of Construction	**2,056.40**	**0.17**	**0.17**	**2,113.00**
			Amortized Over 30-Years	*70.43*
			GHG Emissions Threshold	**900**
			Threshold Exceeded?	***No***

Notes: GHG = greenhouse gas; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent. See Appendix E for details.

Operational Emissions

As indicated in Section 4.7.3.2, once Project construction is complete, operations would be similar to existing conditions. As such, no additional sources of GHGs are anticipated during long-term operations.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to GHG emissions, and therefore, no mitigation measures are required.

Impact GHG-2: Conflict with an Applicable GHG Reduction Plan (Significance Threshold B). The Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. ***(Less than Significant)***

While there are no mandatory GHG plans, policies, or regulations or finalized agency guidelines that would apply to implementation of the Proposed Project, an analysis of the potential for the Proposed Project to conflict with relevant plans that include GHG reduction strategies is provided below.

Climate Action Plans

The overall goals and GHG reduction strategies of the City of Santa Cruz CAP and County of Santa Cruz CAS are described in Section 4.7.2.4. The Proposed Project would not conflict with either of these City or County plans. As described previously in Section 4.7.2.4, Local, no recommended measures in the City of Santa Cruz CAP or County of Santa Cruz CAS are applicable to the Proposed Project.

AMBAGs' Metropolitan Transportation Plan/Sustainable Communities Strategy

AMBAG's 2040 MTP/SCS is a regional growth-management strategy that targets per-capita GHG reduction from passenger vehicles and light-duty trucks within the Monterey Bay Area. The 2040 MTP/SCS incorporates local land use projections and circulation networks from city and county general plans. Typically, a project would be consistent with the MTP/SCS if the project does not exceed the underlying growth parameters within the MTP/SCS. Since the Proposed Project would not result in increased long-term employment or population growth, the Proposed Project would not contribute to an exceedance of AMBAG growth projections for the County. Furthermore, as described in Table 4.7-4 on the next page, the Proposed Project would not conflict with the major goals of the 2040 MTP/SCS.

California Air Resources Board's Scoping Plan

The Scoping Plan, approved by CARB on December 12, 2008 and updated in 2014 and 2017, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the State CEQA Guidelines, the CNRA observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009b). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. The Proposed Project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent applicable and required by law.

Regarding consistency with SB 32 (goal of reducing GHG emissions to 40% below 1990 levels by 2030) and EO S-3-05 (goal of reducing GHG emissions to 80% below 1990 levels by 2050), there are no established protocols or thresholds of significance for those future-year analyses. However, as described in Impact GHG-1, amortized construction GHG emissions from the Proposed Project would not exceed the applied threshold of 900 MT CO_2e per year, which was established based on the goal of AB 32 to reduce statewide emissions to 1990 levels by 2020. The Proposed Project involves the construction of replacement utility infrastructure and would not create substantial GHG emissions, during either construction or operation, and would not conflict with the statewide emission reduction goals set forth in AB and SB 32. Therefore, the Proposed Project would also be considered consistent with implementation of any of the above-described GHG-reduction goals for 2030 and beyond.

Based on the above considerations, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. This impact would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to conflicts with applicable GHG reduction plans, and therefore, no mitigation measures are required.

Table 4.7-4. Review of the Association of Monterey Bay Area Governments' 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy Goals and Proposed Project

MTP/SCS Goal	Project Consistency
Provide convenient, accessible, and reliable travel options while maximizing productivity for all people and goods in the region.	**No conflict.** The Proposed Project would not inhibit AMBAG from strengthening the regional transportation network for goods movement.
Raise the region's standard of living by enhancing the performance of the transportation system.	**No conflict.** The Proposed Project would not inhibit AMBAG from preserving and expanding the existing regional transit system.
Promote environmental sustainability and protect the natural environment.	**No conflict.** The Proposed Project would not inhibit AMBAG from promoting sustainability within the Monterey Bay Area region.
Protect the health of our residents; foster efficient development patterns that optimize travel, housing, and employment choices and encourage active transportation.	**No conflict.** The Proposed Project would not inhibit AMBAG from preserving and expanding the existing regional transit system.
Provide an equitable level of transportation services to all segments of the population.	**No conflict.** The Proposed Project would not inhibit AMBAG from strengthening the regional transportation network for all segments of the population.
Preserve and ensure a sustainable and safe regional transportation system.	**No conflict.** The Proposed Project would not inhibit AMBAG from providing a sustainable and safe transportation system.

Source: AMBAG 2018.
Notes: AMBAG = Association of Monterey Bay Area Governments; MTP/SCS = Metropolitan Transportation Plan/Sustainable Communities Strategy.

4.7.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative GHG impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic. The geographic area for the analysis of cumulative impacts resulting from GHG emissions is the Earth as GHG emissions are a global concern.

Impact GHG-3: Cumulative GHG Impacts (Significance Thresholds A and B). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to GHG emissions. However, the Proposed Project's contribution would not be cumulatively considerable. ***(Less than Significant)***

Cumulative development throughout the North Central Coast Air Basin region and beyond would generate GHG emissions that could have a significant impact on the environment. Accordingly, the analysis above takes into account the potential for the Proposed Project to contribute to a cumulative impact of global climate change. As shown in Table 4.7-3, the Proposed Project's GHG emissions would not exceed the applied threshold of 900 MT CO2e per year. Therefore, the project's contribution to global GHG emissions is not cumulatively considerable. In addition, as described in Impact GHG-2 above, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. Therefore, the Proposed Project's contribution to significant cumulative GHG impacts would not be cumulatively considerable and would be less than significant.

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4.8 Hazards and Hazardous Materials

This section describes the existing hazards and hazardous material conditions of the project and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). This analysis is based on a review of online hazardous material site databases. The following two issues that are often included in hazards and hazardous materials sections are addressed in other sections: potential impairment of emergency evacuation routes is addressed in Section 4.11, Transportation, and wildfire hazards are addressed in Section 4.12, Wildfire.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to hazards and hazardous materials.

4.8.1 Existing Conditions

4.8.1.1 Hazardous Materials

Definitions and Overview

As defined in the California Health and Safety Code Section 25501, "hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant hazard to human health and safety, or to the environment, if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing would be injurious to the health and safety of persons, or harmful to the environment if released into the workplace or the environment. Hazardous wastes are hazardous substances that no longer have a practical use, such as material that has been abandoned, discarded, spilled, or contaminated, or is being stored prior to proper disposal.

California Code of Regulations (CCR), Title 22, Chapter 11, Article 2, Section 66261.10 provides the following definition for hazardous waste:

> [A] waste that exhibits the characteristics may: (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 the environment when it is improperly treated, stored, transported, disposed of or otherwise managed.

According to CCR Title 22, substances having a characteristic of toxicity, ignitability, corrosivity, or reactivity are considered hazardous waste. Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (levels depend on the substance involved). Carcinogens, substances known to cause cancer, are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline).

Ignitable substances, such as gasoline, hexane, and natural gas, are hazardous because of the flammable properties. Corrosive substances (e.g., strong acids and bases such as sulfuric battery acid or lye) are chemically active and can damage other materials or cause severe burns upon contact. Reactive substances (e.g., explosives, pressurized canisters, and pure sodium metal, which react violently with water) may cause explosions or generate gases or fumes.

Regulatory Records Review Methodology

Government Code Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to compile a list of hazardous waste and substances sites (Cortese List). This list is used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. The Cortese List must be updated annually. While the Cortese List is no longer maintained as a single list, the following databases provide information that meet the Cortese List requirements:

- List of hazardous waste and substance sites from the Department of Toxic Substances Control's (DTSC's) EnviroStor database (DTSC 2021a) (Health and Safety Codes 25220, 25242, 25356, and 116395).
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the California Health and Safety Code, as identified by DTSC's EnviroStor database.
- List of leaking underground storage tank (LUST) sites from the State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB 2021a) (Health and Safety Code 25295).
- List of solid waste disposal sites, identified by the SWRCB GeoTracker database, with waste constituents higher than hazardous waste levels outside the waste management unit (Water Code Section 13273 subdivision [e] and 14 CCR Section 18051).
- List of cease and desist orders and cleanup and abatement orders identified by the SWRCB GeoTracker database (Water Code Sections 13301 and 13304).

A search of the Cortese List databases was conducted in May and June 2021. The search included sites listed on the DTSC portion of the Cortese List (i.e., hazardous waste sites) within 1.0 mile of the Proposed Project alignment, as well as sites listed on the remaining portions of the Cortese List (i.e., nonhazardous waste sites) within 0.5 mile of the Project alignment. A database search was not completed for the proposed existing pipeline to be abandoned in-place, as proposed ground disturbance would be limited to removal of fire hydrants along Pipeline Road in Henry Cowell Redwoods State Park. The existing pipeline to be decommissioned would be capped off and filled with grout in-place.

Regulatory Records Review Results

DTSC Cortese Sites

The DTSC is responsible for a portion of the information contained in the Cortese List. The Proposed Project alignment is within 1.0 mile of several DTSC Cortese List sites, including the following:

Valeteria Dry Cleaners. Dry cleaning solvent leaked from a septic system during dry cleaning operations from 1960 to 1962, resulting in soil and groundwater contamination, as well as contamination of a nearby spring

and the San Lorenzo River. This active Cleanup Program site is located at 6531 Highway 9, in Felton, approximately 0.1 mile southwest of the San Lorenzo Way pipe section of the northern segment of the Proposed Project, on the opposite side of the San Lorenzo River (Figure 4.8-1a). Dry cleaning solvents disposed on-site resulted in tetrachloroethylene (PCE) contamination in groundwater, soil, and the San Lorenzo River. Following initial soil remediation under the DTSC, the case was transferred in 1993 to the Central Coast Regional Water Quality Control Board (RWQCB), who continued with soil and groundwater assessment and remediation (DTSC 2021b). A leaking underground septic tank was also present on-site. The tank and surrounding soil were excavated with U.S. Environmental Protection Agency (EPA) oversight. Although the PCE contamination has been partially remediated in soil, PCE waste continues to discharge to the San Lorenzo River. Groundwater is approximately 23 feet below ground surface. Additional site assessment and remediation is planned (SWRCB 2021c).

Former Santa Cruz Lumber Company (current San Lorenzo Lumber Yard). Metals contamination has been documented in on-site soils as a result of prior wood treatment operations from 1973 to 1986. The northeast corner of this 35-acre site, located at 5843 Graham Hill Road, is immediately adjacent to the Graham Hill Road North pipe section in the Proposed Project southern segment (Figure 4.8-1b). In addition, petroleum hydrocarbons as diesel, VOCs, and SVOCs were detected in soil and groundwater as a result of a leaking above-ground storage tank (AST). However, diesel, VOC, and SVOC contamination was confined to the immediate vicinity of the AST, located approximately 800 feet southwest of the Project pipeline alignment. Remedial investigations and remediation were conducted from 1986 to 1987 to address metals-impacted soils. The site was closed with respect to regulatory compliance in 1988/1989; however, the site was re-opened in 2015 and additional site investigations are on-going, under the guidance of the DTSC (DTSC 2021c).

Based on a February 2020 work plan (Trinity Source Group 2020), which summarizes existing contamination and proposes additional areas of soil and groundwater sampling, the primary areas of contamination are in the southern and western portions of the site, in the vicinity of the former wood treatment facility, former burner area (i.e., incinerator), and former diesel AST. Chemicals of potential concern (COPCs) in soil and groundwater originally included total chromium, hexavalent chromium, copper, arsenic, formaldehyde, petroleum hydrocarbons as diesel, volatile organic compounds (VOCs), semi-volatile VOCs (SVOCs), and chromate copper arsenate (CCA). However, previous investigations concluded that: 1) CCA has not impacted groundwater; 2) hexavalent chromium and formaldehyde are likely naturally occurring and are not considered COPCs; 3) copper is not considered a COPC; 4) VOCs and SVOCs are limited to the immediate vicinity of the former AST, and 5) arsenic impacts are limited to the upper 2.5 feet of soil, with naturally occurring levels present in groundwater. A background level arsenic assessment was also completed as part of previous site investigations to calculate the risk-based arsenic levels, based on DTSC guidance,

The area of current soil contamination that exceeds regulatory screening levels is restricted to arsenic and is approximately 300 feet from the proposed pipeline alignment on Graham Hill Road, at the closest point. Additional soil sampling was proposed in the February 2020 work plan (Trinity Source Group 2020) to further evaluate shallow soils for the presence of arsenic, such that a Soil Management Plan can be developed to protect construction workers during future development. Sampling is proposed within 100 feet of the proposed pipeline alignment.

Groundwater was encountered at a depth of 28 feet beneath the site and flows to the west-southwest, toward the San Lorenzo River (i.e., opposite direction from the Project alignment). The work plan includes groundwater sampling and analysis for arsenic, formaldehyde, VOCs, SVOCs, and polycyclic aromatic hydrocarbons (PAHs).

Kaiser Pit. The Kaiser Pit, a former sand and gravel quarry that was subsequently used for disposal of treated effluent from the City of Scotts Valley Wastewater Treatment Plant, is approximately 300 feet northeast of the Graham Hill Road North pipe section, at the closest point (Figure 4.8-1b). Several industrial facilities and small shops were connected to the sanitary sewer system while wastewater was discharged to the Kaiser Pit. In 1985, analytical testing performed for the City of Scotts Valley revealed the presence of VOCs in plant effluent, including perchloroethylene, dichloroethylene, and chloromethane. Based on sampling and analysis completed at the site, the Kaiser Pit was removed from the Cortese List in 1988 and as of November 7, 2003, no further action was required by the DTSC with respect to potentially contaminated soil and groundwater (DTSC 2021d).

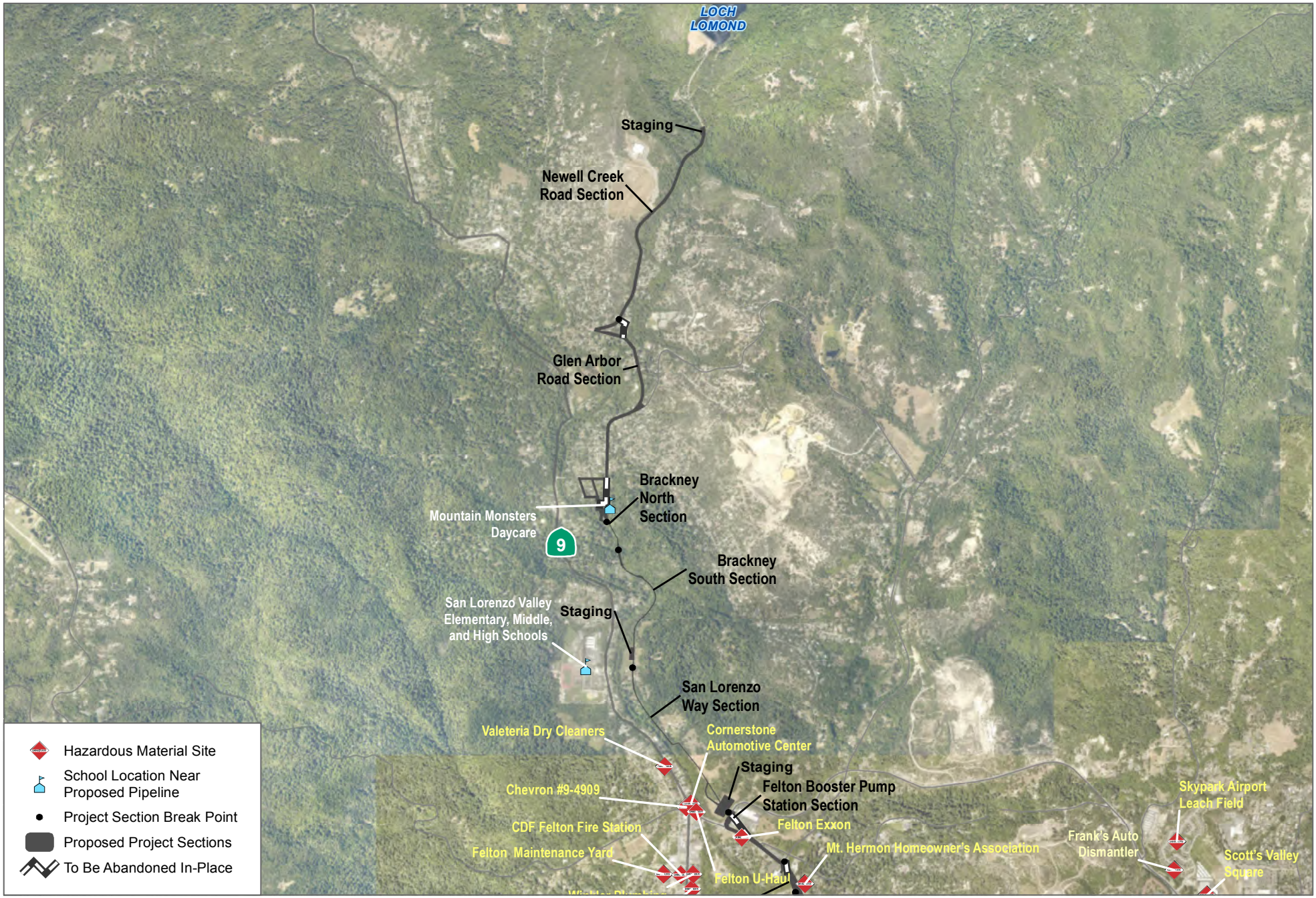
Franks Auto Dismantler. This 1.0-acre site, which included a wrecking yard from the 1960s until 1990, is located at 700 Mount Hermon Road in Scotts Valley, approximately 0.8 mile northeast of the Graham Hill Road North pipe section at the closest point (Figure 4.8-1b). Two abandoned underground storage tanks (USTs) were removed from the site in 1993 and the Scotts Valley Fire Protection District approved regulatory closure (i.e., no further action required) for the USTs. Non-hazardous concentrations of metals were detected in soil samples collected at the site in 2003 in association with a DTSC Preliminary Endangerment Assessment. Based on the relatively low concentrations of metals, the site was referred to the California Integrated Waste Management Board with respect to cleanup of auto parts, trash, debris, and tires (DTSC 2021e).

Scotts Valley Square. Based on a Phase I Environmental Site Assessment in 1993, PCE associated with dry-cleaning operations was detected in soil and groundwater at Scotts Valley Square. The Scotts Valley Square site is located at 272-A Mount Hermon Road in Scotts Valley, approximately 0.8 mile northeast of the Proposed Project Graham Hill Road North pipe section at the closest point (Figure 4.8-1b). A DTSC Preliminary Endangerment Assessment was subsequently completed, which included a soil and groundwater assessment. In 2001, the DTSC referred the case to the Central Coast RWQCB for additional oversight. Additional site assessment and remediation has been completed under the guidance of the RWQCB (DTSC 2021f).

Skypark Airport Leachfield. VOC-contaminated wastewater was released into the subsurface, from 1967 to 1973, in connection with an 80-acre, City of Scotts Valley municipal waste leachfield, approximately 1.0 mile northeast of the Graham Hill Road North pipe section (Figure 4.8-1b). The release of contaminated wastewater potentially contributed to regional contamination of the Santa Margarita aquifer, which is a federally designated Sole Source Aquifer for the Scotts Valley region. However, based on soil sampling completed at the site in 1994, the site was determined by the DTSC to be suitable for residential development, no further action was required, and approximately 200 homes were constructed (DTSC 2021g).

State Water Resources Control Board (SWRCB) GeoTracker Sites

Other State and local government agencies are required to provide additional hazardous materials release information for the Cortese List. GeoTracker is the SWRCB's data management system for sites that impact, or have the potential to impact, water quality in California, with an emphasis on groundwater. GeoTracker contains records for sites that require cleanup, such as leaking underground storage tank (LUST) sites, Department of Defense sites, and Cleanup Program sites. GeoTracker also contains records for various unregulated projects, as well as permitted facilities including irrigated lands, oil and gas production, operating USTs, and land disposal sites. The Proposed Project alignment is within 0.5 mile of numerous GeoTracker sites summarized below, as well as the Valencia Dry Cleaners and former Santa Cruz Lumber Company sites, as described above.



SOURCE: ESRI Imagery 2021, County of Santa Cruz 2021

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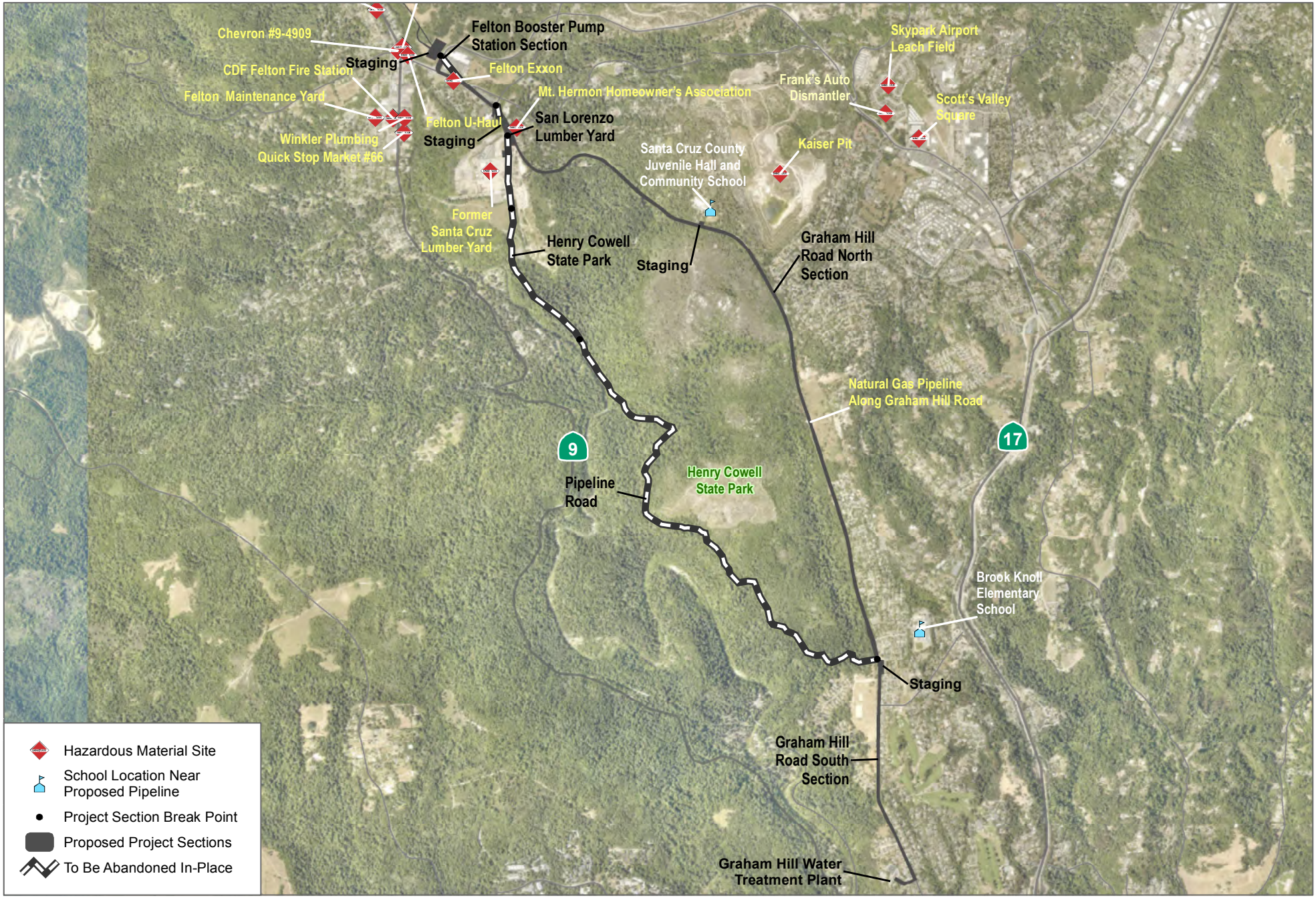
0 1,500 3,000 Feet

FIGURE 4.8-1A

Hazardous Materials Sites - Northern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: ESRI Imagery 2021, County of Santa Cruz 2021

DUDEK

0 1,500 3,000 Feet

FIGURE 4.8-1B

Hazardous Materials Sites - Southern Segment

Newell Creek Pipeline Improvement Project

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San Lorenzo Valley Elementary School. This LUST site, located 0.2 mile west of the Brackney South pipe section in the northern segment of the Proposed Project pipeline alignment (Figure 4.8-1a), included gasoline-contaminated soil and groundwater that was remediated. The County of Santa Cruz Health Services Agency granted site closure in August 2011, indicating no further remedial actions are required (SWRCB 2021b).

Chevron #9-4909. Gasoline-impacted groundwater has been undergoing remediation at this active LUST site since the early 1990s. This site is located at 6325 Highway 9 in Felton, approximately 0.2 mile southwest of the San Lorenzo Way pipe section in the northern segment of the Proposed Project pipeline alignment, on the opposite side of the San Lorenzo River (Figure 4.8-1a). Although the site has been eligible for closure since January 2015, the Central Coast RWQCB has not granted closure to-date (SWRCB 2021d).

Cornerstone Automotive Service. This LUST site is located at 6320 Highway 9, approximately 0.1 mile southwest of the San Lorenzo Way pipe section on the opposite side of the San Lorenzo River (Figure 4.8-1a). Two phases of site assessment and remediation occurred as a result of gasoline releases at the site. The first phase occurred from 1988 to 1997, at which point site closure was granted by the Central Coast RWQCB. The second phase occurred from 2010 to 2016, at which point site closure was granted, indicating that no additional site assessment or remediation is required (SWRCB 2021e). Site closure can be granted more than one time on a given site. When site closure is granted by environmental regulatory agencies, those agencies always reserve the right to reopen the case in the event that emerging contaminants are discovered. Emerging contaminants are defined as chemicals that are not currently (or have been only recently) regulated and about which there exist concerns regarding their impact on human or ecological health.

Felton U-Haul. Groundwater has been impacted by gasoline releases at this LUST site, located at 6440 Graham Hill Road in Felton. The Felton U-Haul site is approximately 0.1 mile southwest of the San Lorenzo Way pipe section on the opposite side of the San Lorenzo River (Figure 4.8-1a). The Central Coast RWQCB granted closure for this site in August 1992, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021f).

Felton Exxon. Groundwater has been impacted by gasoline releases at this LUST site, located at 6225 Graham Hill Road in Felton. The Felton Exxon site is immediately adjacent (to the southwest) the Felton Booster Pump Station pipe section in the northern segment of Proposed Project pipeline alignment (Figure 4.8-1a). The Central Coast RWQCB granted closure for this site in February 2013, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021g).

Mt. Hermon Homeowner's Association. Groundwater has been impacted by diesel fuel releases at this LUST site, located at 5700 Graham Hill Road. This site is across Graham Hill Road from the proposed Zayante Creek Crossing (Figure 4.8-1b). The Central Coast RWQCB and Santa Cruz County Environmental Health granted closure for this site in October 2003, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021h).

Felton Maintenance Yard. Groundwater has been impacted by gasoline releases at this LUST site, located at Gushee & Hihn, in Felton. This site is approximately 0.4 mile southwest of the Felton Booster Pump Station pipe section (Figure 4.8-1a). Santa Cruz County Environmental Health granted closure for this site in July 1993, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021i).

CDF Felton Forest Fire Station. Groundwater has been impacted by diesel fuel releases at this LUST site, located at 6059 Highway 9, in Felton. This site is approximately 0.3 mile southwest of the Felton Booster Pump Station pipe section (Figure 4.8-1a). The Central Coast RWQCB granted closure for this site in February 2014, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021j).

Quik Stop Market #66. Groundwater has been impacted by gasoline releases at this LUST site, located at 5960 Highway 9, in Felton. This site is approximately 0.3 mile southwest of the Felton Booster Pump Station pipe section in the northern segment of the Proposed Project pipeline alignment (Figure 4.8-1a). The Central Coast RWQCB granted closure for this site in August 2001, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021k).

Winkler Plumbing. Groundwater has been impacted by kerosene releases at this site, located at 6036 Highway 9, in Felton. This site is approximately 0.3 mile southwest of the Felton Booster Pump Station pipe section (Figure 4.8-1a). The Central Coast RWQCB granted closure for this site in April 2013, indicating no further action is required with respect to site assessment or remediation (SWRCB 2021l).

Project Soil Sampling and Analysis

As discussed in Section 4.6 Geology and Soils, project-specific geotechnical soil borings were completed in the Brackney landslide area (Figure 4.8-1a). In addition, potholing was completed to verify the depth to the existing pipeline. Three potholes were completed in proximity to borings B-1, B-2, and B-3, and a soil sample was collected from depths of 2 to 4 feet and analyzed for total petroleum hydrocarbons (TPH), as diesel/motor oil; volatile organic compounds (VOCs), including TPH as gasoline; and Title 22 metals. Based on the analyses, TPH as gasoline, diesel, and motor oil were not detected above laboratory reporting limits. Most metals were similarly not detected above the laboratory reporting limits. Exceptions include 4-isopropyl toluene, a VOC with no corresponding environmental screening level (ESL) for Human Health Risk Levels (i.e., action level, as established by the San Francisco Bay RWQCB), and arsenic, which is a metal that was detected above the ESL but is less than the estimated background concentrations in the area (CE&G 2021a, 2021b). More specifically, the metals cadmium, molybdenum, and selenium exceeded the ESL protective of terrestrial habitat and regional background. Arsenic was the only analyte detected in soil samples at concentrations above the 0.067 milligrams/kilograms (mg/kg) ESL protective of residential cancer risk and 2.0 milligrams/liter (mg/L) construction worker ESL. The arsenic concentrations ranged from 5.9 mg/kg to 21 mg/kg, with a median concentration of 9.2 mg/kg. The regional background concentration for arsenic is 11 mg/kg. Due to the limited number of soil samples, statistical analysis to identify confidence limits and potential outliers could not be performed.

4.8.1.2 Airport Hazards

No airports are located within 2 miles of the Proposed Project alignment, nor does the pipeline alignment lie within an airport land use plan. The nearest public airport is in Watsonville, approximately 17 miles southeast of the Project alignment, and the nearest private airstrip is located at Bonny Doon Village, approximately 2.5 miles west of the Project alignment.

4.8.1.3 Pipelines and Oil/Gas Drilling Features

A search was conducted for hazardous materials pipelines and oil drilling features that could affect the Proposed Project. The search included the National Pipeline Mapping System (NPMS 2021) and the California Geologic Energy Management Division (CalGEM) Well Mapping database (CalGEM 2021). As indicated on Figure 4.8-1b, a natural gas pipeline is present along the Graham Hill Road North and South pipe sections in the Proposed Project southern segment. According to the CalGEM database, there are no active oil and gas wells within 1 mile of the proposed pipeline route. Therefore, oil and gas wells are not considered a potential hazard to the Proposed Project.

4.8.1.4 Sensitive Receptors

The Proposed Project alignment traverses several residential neighborhoods and business districts, including those within Ben Lomond and Felton, and residential areas along Graham Hill Road. The nearest residence is immediately adjacent to the pipeline route at the south end of Fremont Avenue at the northern end of the Brackney North pipe section. Several schools and a day care facility are within 0.25 mile of the Project alignment. The Mountain Monsters Daycare is approximately 0.1 mile east of the proposed alignment, in Glen Arbor (Figure 4.8-1a). San Lorenzo Valley Elementary School, San Lorenzo Valley Middle School, and San Lorenzo Valley High School are approximately 0.2 mile west of the proposed pipeline alignment, in Felton. The Santa Cruz County Juvenile Hall and Community School is immediately northeast of the pipeline route, along Graham Hill Road, southeast of Felton (Figure 4.8-1**B**), and Brook Knoll Elementary School is approximately 0.2 mile east of the pipeline route, along the southern portion of Graham Hill Road (CDE 2021; Google 2021).

4.8.2 Regulatory Framework

4.8.2.1 Federal

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 provides the EPA with authority to require reporting, record-keeping, and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from the Toxic Substances Control Act, including food, drugs, cosmetics, and pesticides.

Hazardous Materials Transportation Act

Transportation of hazardous materials is regulated by the U.S. Department of Transportation's Office of Hazardous Materials Safety. The office formulates, issues, and revises hazardous materials regulations under the Federal Hazardous Materials Transportation Law. The hazardous materials regulations cover hazardous materials definitions and classifications, hazard communications, shipper and carrier operations, training and security requirements, and packaging and container specifications. The hazardous materials transportation regulations are codified in 49 Code of Federal Regulations (CFR) Parts 100–185.

The hazardous materials transportation regulations require carriers transporting hazardous materials to receive training in the handling and transportation of hazardous materials. Training requirements include pre-

trip safety inspections, use of vehicle controls and equipment including emergency equipment, procedures for safe operation of the transport vehicle, training on the properties of the hazardous material being transported, and loading and unloading procedures. All drivers must possess a commercial driver's license as required by 49 CFR Part 383. Vehicles transporting hazardous materials must be properly placarded. In addition, the carrier is responsible for the safe unloading of hazardous materials at the site, and operators must follow specific procedures during unloading to minimize the potential for an accidental release of hazardous materials.

Occupational and Safety Health Act

The Occupational Safety and Health Administration (OSHA) is responsible at the federal level for ensuring worker safety. OSHA sets federal standards for implementing workplace training, exposure limits, and safety procedures for the handling of hazardous substances and hazardous materials (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. The Federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste, as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program.

Regional Screening Levels

The federal EPA provides regional screening levels for chemical contaminants to provide comparison values for residential and commercial/industrial exposures to soil, air, and tap water (drinking water). Regional screening levels (RSLs) are available on the EPA's website and provide a screening level calculation tool to assist risk assessors, remediation project managers, and others involved with risk assessment and decision-making. RSLs are also used when a site is initially investigated to determine if potentially significant levels of contamination are present to warrant further investigation. In California, the DTSC Human and Ecological Risk Office (HERO) incorporated the EPA RSLs into the HERO human health risk assessment. HERO created Human Health Risk Assessment Note 3, which incorporates HERO recommendations and DTSC-modified screening levels (DTSC-SLs) based on review of the EPA RSLs. The DTSC-SL should be used in conjunction with the EPA RSLs to evaluate chemical concentrations in environmental media at California sites and facilities.

Federal Response Plan

The Federal Response Plan of 1999, as amended in 2003 by FEMA, is a signed agreement among 27 federal departments and agencies, including the American Red Cross, that (1) provides the mechanism for coordinating delivery of federal assistance and resources to augment efforts of state and local governments overwhelmed by a major disaster or emergency; (2) supports implementation of the Robert T. Stafford Disaster

Relief and Emergency Act, as well as individual agency statutory authorities; and (3) supplements other federal emergency operations plans developed to address specific hazards. The Federal Response Plan is implemented in anticipation of a significant event likely to result in a need for federal assistance or in response to an actual event requiring federal assistance under a presidential declaration of a major disaster or emergency.

4.8.2.2 State

Certified Unified Program

CalEPA implements and enforces a statewide hazardous materials program known as the Certified Unified Program, established by Senate Bill 1802 to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for the following environmental and emergency management programs for hazardous materials:

- Hazardous Materials Release Response Plans and Inventories (Business Plans)
- California Accidental Release Prevention Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Requirements for Spill Prevention, Control, and Countermeasure Plans
- Hazardous Waste Generator and On-Site Hazardous Waste Treatment Programs
- California Uniform Fire Code, Hazardous Materials Management Plans, and Hazardous Material Inventory Statements

CalEPA certifies local government agencies as Certified Unified Program Agencies (CUPA) to implement hazardous waste and materials standards. The Santa Cruz County Environmental Health Services is designated as the local CUPA in Santa Cruz County.

California Safe Drinking Water and Toxic Enforcement Act of 1986

California Health and Safety Code Division 20, Chapter 6.6 establishes regulation on the prohibition of contaminating drinking water. This includes discharges or release onto land which may pass into a drinking water source.

California Unified Agency Review of Hazardous Materials Release Sites

California Health and Safety Code Division 20 Chapter 6.65 establishes regulation on identification of hazardous material release sites and agency overview of remedial actions on these sites. The regulation also provides agency oversight on all aspects of site investigation and remedial action. Monitoring, testing, and site conditions, restrictions, and limitations can be required and enforced by the overseeing agency.

Petroleum Underground Storage Tank Cleanup

California Health and Safety Code Division 20. Chapter 6.75 establishes regulations that requires corrective action for petroleum releases from underground storage tanks.

California Hazardous Waste Control Law

California Health and Safety Code Division 20, Chapter 6.5 establishes regulations to protect the public health and the environment by assisting generators of hazardous waste in meeting the responsibility for the safe disposal of hazardous waste. The California Hazardous Waste Control Law is administered by CalEPA and pertains to administering a state hazardous waste program in lieu of the federal RCRA program, pursuant to Section 3006 of Public Law 94-580, as amended. The Hazardous Waste Control Law lists 791 chemicals and approximately 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Accidental Release Prevention Program

Similar to the Federal Risk Management Program, the California Accidental Release Prevention Program includes additional state requirements and an additional list of regulated substances and thresholds. The regulations of the program are contained in CCR Title 19, Division 2, Chapter 4.5. The intent of the California Accidental Release Prevention Program is to provide first responders with basic information necessary to prevent or mitigate damage to public health, safety, and the environment from the release or threatened release of hazardous materials.

California Department of Toxic Substances Control and California Highway Patrol Hazard Transportation Program

The California DTSC administers the transportation of hazardous materials throughout the state. Regulations applicable to the transportation of hazardous waste include Title 22, Division 4.5, Chapter 13 and Chapter 29 of the CCR, as well as Division 20, Chapter 6.5, Articles 6.5, 6.6, and 13 of the California Health and Safety Code. The DTSC requires that drivers transporting hazardous wastes obtain a certificate of driver training that shows the driver has met the minimum requirements concerning the transport of hazardous materials, including proper labeling and marking procedures, loading/handling processes, incident reporting and emergency procedures, and appropriate driving and parking rules. The California Highway Patrol also requires shippers and carriers to complete hazardous materials employee training before transporting hazardous materials.

California Health and Safety Code

The handling and storage of hazardous materials is regulated by Division 20, Chapter 6.95 of the California Health and Safety Code. Under Sections 25500–25543.3, facilities handling hazardous materials are required to prepare a Hazardous Materials Business Plan (HMBP), which contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state.

Chapter 6.95 of the Health and Safety Code establishes minimum statewide standards for HMBPs. Each business shall prepare a HMBP if that business uses, handles, or stores a hazardous material (including hazardous waste) or an extremely hazardous material in quantities greater than or equal to 500 pounds of a solid substance, 55 gallons of a liquid, 200 cubic feet of compressed gas, a hazardous compressed gas in any amount (highly toxic with a Threshold Limit Value of 10 parts per million or less), or extremely hazardous

substances in threshold planning quantities. In addition, in the event that a facility stores quantities of specific acutely hazardous materials above the thresholds set forth by California code, facilities are also required to prepare a Risk Management Plan and California Accidental Release Plan.

California Occupational Safety and Health Administration Hazard Handling Procedures

The California Division of Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR 337–340). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

California Department of Transportation/California Highway Patrol

Under Title 13 CCR, Division 2, Chapter 6, California regulates the transportation of hazardous waste originating or passing through the state. The California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provides detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of CHP. CHP conducts regular inspections of licensed transporters to ensure regulatory compliance. Caltrans has emergency chemical spill identification teams at locations throughout the state. Hazardous waste must be regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests.

Environmental Screening Levels

Environmental Screening Levels (ESLs) provide conservative screening levels for over 100 chemicals found at sites with contaminated soil and groundwater. ESLs are intended to help expedite the identification and evaluation of potential environmental concerns at contaminated sites. The ESLs were developed by the San Francisco Bay RWQCB; however, these screening levels are used throughout the state. While ESLs are not intended to establish policy or regulation, they can be used as a conservative screening level for sites with contamination. Other agencies in California currently use the ESLs (as opposed to RSLs). In general, the ESLs could be used at any site in the state, provided all stakeholders agree. In recent years, regulatory agencies in various regions have used ESLs as regulatory cleanup levels. The ESLs are not generally used at sites where the contamination is solely related to a LUST; those sites are instead subject to the Low-Threat Underground Storage Tank Closure Policy.

4.8.2.3 Local

County of Santa Cruz Environmental Health

As previously discussed, Santa Cruz County Environmental Health is designated by CalEPA as the CUPA within the geographic boundaries of the County and is responsible for enforcing the local ordinance and state laws

pertaining to use and storage of hazardous materials, including the issuance and administration of Hazardous Materials Management Plans (HMMPs). The County Fire Department and associated fire protection districts work in conjunction with County Environmental Health in responding to reports of hazardous materials spills and accidents, enforcing hazardous materials regulations, and enforcing the County's fire code as it relates to the use and storage of hazardous materials.

4.8.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to hazards and hazardous materials. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.8.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to hazards and hazardous materials are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

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.

C. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed school.

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, create a significant hazard to the public or the environment.

E. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area.

4.8.3.2 Analytical Methods

This impact analysis assumes that the Proposed Project would be constructed and operated in compliance with the policies and regulations applicable to hazards and hazardous materials, as described above in Section 4.8.2, Regulatory Framework. A review of applicable regulatory records was conducted to characterize the existing environmental setting in the Project area, as described above in Section 4.8.1, Existing Conditions, and to identify any existing hazardous waste and substances sites on or near the project site that could affect construction or operation of the Proposed Project. Upon completion of construction, operations and maintenance would continue as currently exists.

Application of Relevant Standard Construction Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. The Proposed Project includes standard construction practices that would avoid or minimize adverse effects to nearby active streams or other water bodies due to hazardous materials. These practices and their effectiveness in avoiding and minimizing effects are described below.

Standard Construction Practice #6 requires that heavy equipment not be stored within a minimum of 65 feet of any active stream channel or water body to prevent the potential for hazardous spills and water contamination. Standard Construction Practice #7 requires construction vehicles and equipment to have and maintain spill kits and that equipment be checked daily for leaks in order to prevent hazardous materials spills into water bodies. Standard Construction Practice #8 requires regular equipment inspections to prevent equipment fluid leaks.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, if applicable, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.8.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance as described below:

- **Airport Hazards (Significance Threshold E).** The Proposed Project alignment is not within 2 miles of a public airport or public use airport; therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area. The Proposed Project would have no impact.

Project Impacts

Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials (Significance Threshold A). The Proposed Project would require use and transportation of petroleum products and small quantities of hazardous materials but would not result in a significant hazard to the public or environment. ***(Less than Significant)***

Relatively small amounts of commonly used hazardous substances such as gasoline, diesel fuel, lubricating oil, adhesive materials, grease, and solvents would be used for equipment during construction. These materials are not considered extremely hazardous and are used routinely for both construction projects and structural improvements. These materials would be managed in accordance with the City's Standard Construction Practices regarding prevention of and response to potential hazardous materials spills during construction, as described in Section 4.8.3.2, Analytical Methods. In addition, horizontal directional drilling

(HDD) would be used to install the proposed pipeline across the Brackney North pipe section. As discussed in more detail in Section 4.9, Hydrology and Water Quality, HDD uses drilling muds that typically consist of a mixture of bentonite and water. Bentonite is an inert clay material and is considered essentially nontoxic.

After installation of the Proposed Project, operations would include continued implementation of pump start-up and valve operations at the Felton Booster Pump Station (FBPS), which may similarly include small amounts of commonly used hazardous substances such as lubricating oil, grease, and solvents. These materials would be transported and handled in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, as described above in Section 4.8.2.

Compliance with these regulations would avoid significant hazard to the public or the environment due to the transport, use, and disposal of these materials . As a result, the impact would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to transport, use or disposal of hazardous materials, and therefore, no mitigation measures are required.

Impact HAZ-2: Reasonably Foreseeable Upset or Accident Conditions (Significance Threshold B). The Proposed Project would not 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. ***(Less than Significant)***

As discussed under Impact HAZ-1, relatively small amounts of commonly used hazardous materials would be used for construction and operation of the Proposed Project. These materials would be handled, stored, transported, and disposed of in accordance with the manufacturer's recommendations and federal, state, and local laws and regulations. In addition, these materials would be managed in accordance with the City's Standard Construction Practices regarding prevention and response to potential accidental fuel spills. As described above, Project operations would be similar to current operation and maintenance activities; therefore, the Project would not result in an increase in routine transport, use, and disposal of hazardous materials and/or wastes generated by routine pipeline operations. While the probability for a release of hazardous materials to the environment would be low, accidental spills, leaks, or other releases of hazardous materials could directly enter the San Lorenzo River, Zayante Creek, Newell Creek, Eagle Creek, Powder Mill Creek, and other subsidiary drainages during construction.

As discussed in Section 4.9, Hydrology and Water Quality, construction activities would cumulatively disturb greater than 1 acre of soil. Therefore, the Proposed Project would be subject to the provisions of the Construction General Permit, including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and implementation of Best Management Practices (BMPs), designed to prevent and minimize incidental spills of petroleum products and hazardous materials during construction. In addition, the City's Standard Construction Practices, as described in Section 3.6.6 Standard Construction Practices, would be employed to ensure water quality protection with respect to potential hazardous materials spills. These are summarized as follows:

- Locate and stabilize spoil disposal and debris areas with sediment control measures so debris and sediments are not conveyed into waterways (Standard Construction Practice #5).
- Restrict equipment and fueling areas within 65 feet of any active stream channel or water body (Standard Construction Practice #6).
- Ensure that gas, oil, or any other hazardous substances are stored within an established containment area, in water-tight containers with secondary containment. Vehicles and equipment would have spill kits available, be checked daily for leaks, and would be properly maintained to prevent contamination of soil or water from leaking hydraulic fluid, fuel, oil, and grease (Standard Construction Practice #7).
- Prevent equipment fluid leaks through regular equipment inspections (Standard Construction Practice #8).
- Implement proper waste/trash management (Standard Construction Practice #9).

With implementation of these Standard Construction Practices, the potential for an accidental release to enter on-site soils, the San Lorenzo River, Zayante Creek, Newell Creek, Eagle Creek, Powder Mill Creek, or other drainages would be minimized.

As indicated on Figure 4.8-1b, a natural gas pipeline is present along the Graham Hill Road North and South pipe sections in the southern segment of the Proposed Project. The Proposed Project pipeline would be installed parallel to this existing gas pipeline. Prior to final Project design, the City would contact the operator of the gas pipeline to determine the exact location of the pipeline, such that the gas pipeline would be avoided as part of the final design. In addition, in compliance with California Government Code 4216, the Project contractor would contact DigAlert at least two days prior to initiating Project excavations. The DigAlert notification would prompt all underground utility operators (i.e., gas, electric, water, telecommunication) to physically mark the location of their utilities to avoid disrupting and/or damaging the utilities during construction. As part of this process, the natural gas pipeline along Graham Hill Road would be identified on the ground surface with markers such as flags, paint, and stakes, thus eliminating the possibility of rupturing the gas pipeline during Project construction.

With implementation of a SWPPP, BMPs, and City Standard Construction Practices, as well as delineation of the existing natural gas pipeline prior to final design and construction, the Proposed Project would not 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. Impacts would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to hazardous materials spills or accidents, and therefore, no mitigation measures are required.

Impact HAZ-3: Hazardous Emissions Near Schools (Significance Threshold C). The Proposed Project would handle hazardous materials, petroleum products, and associated waste within 0.25 mile of existing schools but would not result in a significant hazard to the occupants of those schools. ***(Less than Significant)***

As discussed in Section 4.8.1.5, Sensitive Receptors, several schools and a day care facility are within 0.25 mile of the Project alignment. The Mountain Monsters Daycare is approximately 0.1 mile east of the proposed alignment, in Glen Arbor (Figure 4.8-1a). San Lorenzo Valley Elementary School, San Lorenzo Valley Middle School, and San Lorenzo Valley High School are approximately 0.15 mile west of the proposed pipeline alignment, in Felton. The Santa Cruz County Juvenile Hall and Community School is immediately northeast of the pipeline route, along Graham Hill Road, southeast of Felton (Figure 4.8-1b). And Brook Knoll Elementary School is approximately 0.2 mile east of the pipeline route, along the southern portion of Graham Hill Road.

As discussed for Impact HAZ-1 and HAZ-2, relatively small amounts of commonly used hazardous materials would be used for construction and operation of the Proposed Project. These materials would be handled, stored, transported, and disposed of in accordance with the manufacturer's recommendations and federal, state, and local laws and regulations. In addition, these materials would be managed in accordance with the City's Standard Construction Practices with respect to hazardous materials, as described in Section 3.6.5, Standard Construction Practices. With such measures in-place, Project construction would not result in adverse impacts to students and staff at these schools related to releases of hazardous substances. (See Section 4.2, Air Quality, Impact AIR-2, Exposure of Sensitive Receptors, with respect to air emissions during construction.)

The existing natural gas pipeline along Graham Hill Road would be avoided as part of final Project design and during construction, thus preventing rupture of the gas pipeline and associated hazardous emissions. Pipeline operations would have no impact on nearby schools, as no hazardous substances or petroleum products would be used in the vicinity of the schools.

Therefore, although the Proposed Project would handle hazardous materials, petroleum products, and associated waste within 0.25 mile of existing schools, significant hazard to the occupants of those schools would not occur. Impacts would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to handling of hazardous waste in proximity to schools, and therefore, no mitigation measures are required.

Impact HAZ-4: Hazardous Materials Sites (Significance Threshold D). The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. ***(Less than Significant with Mitigation Incorporated)***

As discussed in Section 4.8.1.1, Hazardous Materials and illustrated on Figures 4.8-1a and 4.8-1b, a database search indicated numerous DTSC Cortese List sites are within 1.0 mile of the proposed pipeline alignment and numerous GeoTracker sites are within 0.5 mile of the pipeline route. Except for two of the sites, given the distance from the proposed alignment, regulatory status of the sites, and/or extent of contamination, soil

and/or groundwater contamination at those sites would not likely affect conditions along the proposed pipeline route. However, the database search identified two active hazardous material sites that are within proximity to the pipeline route. These two sites are discussed below with respect to Project construction.

Valeteria Dry Cleaners/Twohig Property. This active Cleanup Program Site is approximately 0.1 mile southwest of the San Lorenzo Way pipe section in the northern segment of the Proposed Project alignment, on the opposite side of the San Lorenzo River (Figure 4.8-1a). Dry cleaning solvents disposed on-site resulted in PCE contamination in groundwater, soil, and the San Lorenzo River. Although the PCE contamination has been partially remediated in soil, PCE waste continues to discharge to the San Lorenzo River. Additional site assessment and remediation is planned (SWRCB 2021c).

Because this Cleanup Program Site is on the opposite side of the San Lorenzo River, it is unlikely that soil and groundwater contamination extends to the Project pipeline alignment. The river would likely intercept and divert any PCE-contaminated soil and groundwater from reaching the pipeline alignment. Depth to groundwater at the Valeteria site is approximately 23 feet below ground surface. The depth to groundwater in the vicinity of the proposed pipeline alignment is likely similar to the Valeteria site, based on similar distances to the San Lorenzo River. Proposed trenching for the Project pipeline would only extend 5 feet below ground surface. Therefore, it is unlikely that groundwater would be encountered during Project trenching. As a result, impacts would be *less than significant*.

Former Santa Cruz Lumber Yard (current San Lorenzo Lumber Yard). As discussed in Section 4.8.1.1, Hazardous Materials, metals contamination has been documented in on-site soils, as a result of prior wood treatment operations at the former Santa Cruz Lumber Yard. The northeast corner of this 35-acre site is immediately adjacent to the Graham Hill Road North Section of the Proposed Project alignment (Figure 4.8-1b). The primary areas of contamination are in the southern and western portions of the site, in the vicinity of the former wood treatment facility, former burner area (i.e., incinerator), and former diesel AST. The area of current soil contamination that exceeds regulatory screening levels is restricted to arsenic in the upper 2.5 feet of soils and is approximately 300 feet from the proposed pipeline alignment on Graham Hill Road, at the closest point. Additional soil sampling was proposed in a February 2020 work plan (Trinity Source Group 2020) to further evaluate shallow soils for the presence of arsenic, such that a Soil Management Plan can be developed to protect construction workers during future development. Sampling is proposed within 100 feet of the proposed pipeline alignment. In addition, the work plan includes groundwater sampling and analysis for arsenic, formaldehyde, VOCs, SVOCs, and PAHs. Groundwater is approximately 28 feet below ground surface, which is well below the depth of proposed trenching (i.e., 4 to 5 feet below ground surface).

Based on the proximity of the former lumber yard to the proposed pipeline alignment within Graham Hill Road, including proposed soil sampling and analysis for arsenic within 100 feet of the alignment, the potential exists for proposed pipeline trenching to encounter arsenic-contaminated soils, resulting in health and safety impacts to construction personnel. In addition, potential arsenic-contaminated soil would not be suitable for trench backfill. Impacts would be less than significant with mitigation incorporated.

Brackney North Section

In addition to the hazardous materials sites listed above, soil samples collected from depths of 2 to 4 feet below ground surface along the pipeline alignment, in the Brackney North pipe section area, were analyzed for TPH, VOCs, and Title 22 metals. Based on the analyses, TPH as gasoline, diesel, and motor oil were not

detected above laboratory reporting limits. However, cadmium, molybdenum, and selenium exceeded the ESL protective of terrestrial habitat and regional background. In addition, arsenic was detected above the ESLs protective of residential cancer risk and construction worker safety.

The pipeline alignment extends through undeveloped private property along an abandoned railroad bed in the Brackney Road and Rose Acres Lane neighborhoods, including the Brackney landslide area. Railway areas are thought to be sites of intensive heavy metal emission. The railcar and rail line construction material abrasion, fuel combustion in diesel-electric locomotives, and cargo leakage emit particles containing heavy metals into the air and subsequently deposit them into the plant and soil through dry and wet deposition (Wilkomirski et al. 2011; Chillrud et al. 2005; Liu 2009).

Because cadmium, molybdenum, and selenium concentrations in on-site soil samples exceeded the terrestrial habitat ESL, adverse impacts could occur to the environment during project construction in the Brackney Road and Rose Acres Lane neighborhoods, including the Brackney North section area. Similarly, due to the detection of arsenic at approximately two times the background concentration and above the ESL for residential and construction worker exposure, arsenic may present a risk to construction workers and/or soil reuse (e.g., trench backfill). As a result, impacts would be less than significant with mitigation incorporated.

Mitigation Measures

Implementation of Mitigation Measures HAZ-1 and HAZ-2 would reduce impacts to a less-than-significant level.

MM HAZ-1: **Hazardous Materials Management.** Prior to initiation of Project construction, the City shall complete soil sampling within the proposed pipeline route, adjacent to the former Santa Cruz Lumber Yard site at 5843 Graham Hill Road, and in the Brackney Road and Rose Acres Lane neighborhoods, including the Brackney North and Brackney South pipeline sections. Soil samples shall be collected to a depth of 3 feet below ground surface and analyzed for California Administrative Manual (CAM) (i.e., California Title 22) metals.

In the event that Title 22 metals are detected at concentrations in excess of regulatory action levels, as determined by the California Department of Toxic Substances Control (DTSC) and/or Santa Cruz County Environmental Health Division, a Soil Management Plan shall be developed prior to construction that requires potential metals-impacted soils to be segregated and sampled to determine proper disposal options (i.e., hazardous versus nonhazardous landfill) or reuse (e.g., trench backfill). The City shall direct the contractor to consult with an industrial hygienist to determine the appropriate level of personal protective equipment (PPE), if any, that would be required for construction personnel during handling of potential metals-contaminated soil. The contractor shall implement the recommendations by the industrial hygienist to minimize potential exposure of construction personnel to metals concentrations in sediments during construction. All recommendations shall be completed in accordance with Occupational Safety and Health Administration (OSHA) Training Requirements (29 CFR 1910.132 and 1910.134, Subpart I – Personal Protective Equipment).

4.8.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative hazards and hazardous materials impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.1, Introduction to Analyses, and as relevant to this topic. The geographic area for the analysis of cumulative impacts is described below.

Impact HAZ-5: Cumulative Hazardous Materials Impacts (Significance Thresholds A, B, C, and D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to: 1) routine transport, use, disposal, or accidental release of hazardous materials, 2) hazardous emissions or hazardous materials use within 0.25 mile of an existing or proposed school, or 3) hazardous materials sites compiled pursuant to Government Code Section 65962.5. ***(Less than Significant)***

The geographic area for the analysis of cumulative impacts related to hazardous materials consists of the proposed pipeline alignment and areas in proximity to the alignment because impacts related to such hazards depend on the specific conditions on the particular project site and its immediate vicinity. Generally, these site-specific impacts would not combine with one another to create cumulative impacts, unless the cumulative development sites overlapped or were immediately adjacent to one another. The known cumulative projects planned within the geographic area of analysis for cumulative impacts related to hazardous materials include: the Felton Diversion Pump Station Assessment; the Newell Creek Dam Inlet/Outlet Replacement Project; the GHWTP Concrete Tanks Project; and the GHWTP Facility Improvement Project (see Table 4.0-1 in Section 4.0, Introduction to Analyses).

The only cumulative projects with an overlap of construction schedules with the Proposed Project are two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project). However, similar to the Proposed Project, the cumulative projects would be required to comply with all federal, state, and local laws and regulations regarding the use, transport, handling, storage, disposal, and release of hazardous materials, and include project-specific BMPs or SWPPPs (as discussed in Section 4.9, Hydrology and Water Quality), as applicable. Such compliance would reduce the potential for a significant hazard to the public or the environment through routine transport, use, disposal, or accidental release of hazardous materials, including such hazards within 0.25 mile of an existing or planned school site. Although it is possible that one or more cumulative projects could result in significant impacts related to release of hazardous materials to the environment, due to the site-specific nature of this type of impact, it is unlikely that such impacts would combine with the impacts of the Proposed Project or other cumulative projects. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to routine transport, use, disposal, or accidental release of hazardous materials, including such impacts within 0.25 mile of an existing or planned school site.

Like the Proposed Project, cumulative project sites may be located on or in proximity to properties that have been impacted by soil and/or groundwater contamination. Although soil and groundwater contamination can spread beyond cumulative project boundaries, such contamination would be assessed and remediated on a site-specific basis, in accordance with CUPA, State, and federal regulations, as applicable, and would not combine to create a cumulative environmental impact. In the event that known or suspected contaminated

sites are located in proximity to cumulative project sites, those cumulative projects may be required to implement mitigation measures similar to those identified for the Proposed Project (MM HAZ--1 and MM HAZ--2) to help further reduce potential impacts. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to hazardous materials sites compiled pursuant to Government Code Section 65962.5.

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4.9 Hydrology and Water Quality

This section describes the existing hydrology and water quality conditions of the project sites and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to the construction and operation of the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The analysis is based on review of relevant studies and reports regarding hydrology and water quality that have been prepared in the Project area, as well as existing regulatory requirements.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to hydrology and water quality.

4.9.1 Existing Conditions

Both the existing NCP and the Proposed Project pipeline corridor extend approximately 9 miles between the City's Graham Hill Water Treatment Plant (GHWTP) on the south and Newell Creek Dam on the north, mostly within the unincorporated San Lorenzo Valley. The elevation of the site ranges from approximately 80 feet above mean sea level (amsl) at the downstream end of the proposed work area to approximately 400 feet amsl at the highest point at the northern end. The pipeline crosses Newell Creek and Zayante Creek, both tributaries to the San Lorenzo River. The following section summarizes the existing hydrological and water quality conditions in the vicinity of the project sites.

4.9.1.1 Surface Water Resources

Regional Watersheds

The U.S. Geological Survey (USGS) Watershed Boundary Dataset identifies watersheds within the project vicinity and delineates watersheds according to hydrologic units (HUs), identified by name and by hydrologic unit code (HUC) (USGS 2021). At a statewide scale, HUs consist of large regions and subregions draining to a common outlet. At this scale, the project sites are within the 1,924-square-mile California Central Coastal Subbasin (HUC 18050006), which includes all watersheds on the coastal side of Central California south of the San Francisco Peninsula down to Ventura. At the most detailed level available from the USGS, the project sites include the Zayante Creek-San Lorenzo River and Carbonera Creek-San Lorenzo River subwatersheds (USGS 2021a). Watershed areas are summarized in Table 4.9-1.

Although the State Water Resources Control Board (SWRCB) classifies watersheds in a hierarchical system similar to the USGS Watershed Boundary Dataset, it uses watershed names and boundaries that are designated by the California Department of Water Resources (DWR). These geographic boundaries are likewise watershed based, but are typically referred to as hydrologic basins and are defined in the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (Central Coast Regional Water Quality Control Board [RWQCB]

2019).[1] These generally constitute the geographic basis around which many surface water quality problems and goals/objectives are defined, and consist of surface water HUs, hydrologic areas (HA), and hydrologic subareas (HSA). As shown in Table 4.9-1, the project sites are within the Big Basin HU (No. 304), the Santa Cruz HA (No. 304.1), and the San Lorenzo HSA (No. 304.11) (Central Coast RWQCB 2019).

Table 4.9-1. Watershed Designations by Agency

Agency	Hydrologic Unit Code/Basin Number	Agency Analysis Scale	Name	Size (square miles)
USGS Watershed Boundary Dataset	180600	Basin (6-digit HU)	California Central Coastal	13,258
	18060015	Subbasin (8-digit HU)	Monterey Bay	757
	1806001502	Watershed (10-digit HU)	San Lorenzo River	136
	180600150202	Subwatershed (12-digit HU)	Zayante Creek-San Lorenzo River	54
	180600150203	Subwatershed (12-digit HU)	Carbonera Creek. San Lorenzo River	31
Central Coast RWQCB	304	Hydrologic Unit	Big Basin HU	276
	304.10	Hydrologic Area	Santa Cruz HA	246
	304.12	Hydrologic Subarea	San Lorenzo HSA	138
City of Santa Cruz	N/A	Watershed	San Lorenzo	138

Source: USGS 2021a, Central Coast RWQCB 2019, City of Santa Cruz 2021
Notes: HA = hydrologic area; HSA = hydrologic subarea; HU = hydrologic unit; RWQCB = Regional Water Quality Control Board; USGS = U.S. Geological Survey.

The five watersheds that serve as drinking water sources for areas served by the City of Santa Cruz (City) are as follows: Laguna, Liddell, Majors, Newell, and San Lorenzo. The Newell Creek pipeline intersects the San Lorenzo River and Newell Creek watersheds.

Watersheds in the Project Area

San Lorenzo River Watershed

The San Lorenzo River, located within a 138-square mile watershed in northern Santa Cruz County, is the City's largest source of water supply. Originating in the Santa Cruz Mountains, the watershed consists of a 25-mile long main stem and nine principal tributaries that include primary creeks Branciforte, Carbonera, Zayante, Bean, Fall, Newell, Bear, Boulder, Lompico, and Kings Creeks. Zayante Creek is the largest tributary to the San Lorenzo River (City of Santa Cruz Water Department 2013). The Diversion, Tait Diversion, and Coast Pump Station are located on the San Lorenzo River, south of the Proposed Project.

The watershed includes the cites of Santa Cruz and Scotts Valley and the unincorporated communities of Felton, Ben Lomond, and Boulder Creek. Much of the watershed is forested except for these pockets of urban/developed areas. The watershed is comprised predominantly of open space lands (41%) in the northern

[1] The Basin Plan for each region serves as the regulatory reference for meeting both state and federal requirements for water quality control. It designates beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving those objectives.

portion and residential neighborhoods (26%) and paved roads (13%) as the river flows south through the City. Land uses in the remaining 20% of the watershed include commercial businesses and a portion of the University of California, Santa Cruz (UCSC) campus (City of Santa Cruz 2010).

Surface water flows within tributary creeks in the watershed are characterized as flashy with periodic high flow events that coincide with winter storms and low summer baseflows. This results in high-energy systems that have the potential to move a significant quantity of sediment. Stream base flow levels, sustained by groundwater flow, rise in the winter, and decline steadily through the spring and early summer months. The lowest flows occur in the late summer and fall months before winter rains.

Newell Creek Watershed

The Newell Creek watershed is part of the larger San Lorenzo River Watershed and includes the Loch Lomond Reservoir, which is impounded by Newell Creek Dam. Loch Lomond Reservoir is located near the town of Ben Lomond in the Santa Cruz Mountains. The reservoir was constructed in 1960 and has a maximum capacity of 2,810 million gallons. The City-owned tract, which is predominantly upstream of the Newell Creek Dam, comprises approximately 46% of the total watershed. Newell Creek is the largest drainage within this tract, entering the reservoir at the north end. Three other tributaries, including McFarland Creek and two unnamed tributaries (northern tributary and southern tributary), enter the reservoir from the west. Terrain within the watershed consists of rugged, ridge and valley terrain, including narrow crested, steep-sided ridges and deeply incised, v-shaped valleys (City of Santa Cruz Water Department 2013). The Newell Creek Dam impounds water to support the City's water supply production and it does not act as flood control.

Water Quality

The RWQCB establishes beneficial uses and characterizes the water quality of surface water bodies based on watershed boundaries. A watershed identifies an area of land that contains a common set of streams and rivers that all drain into a single larger body of water, such as a larger creek, river, lake, or an ocean. Stormwater pollutants present in all of the City's five watersheds include metals, solvents, paint, concrete, masonry products, detergents, vehicle fuels and fluids, oil and grease, pesticides and herbicides (organic compounds and nutrients), debris and litter, bacteria, pathogens and oxygen demanding compounds, and sediment and silt. However, the primary pollutants of concern in the watershed are sediment, silt, and fecal indicator bacteria. Turbidity, a measure of the ability of light to pass through water, which is affected by the amount of fine sediment suspended within the water column, is typically high during peak flow events for streams in the Santa Cruz Mountains, even in areas that have not been affected by development and ground disturbance. The City has targeted these primary pollutants of concern in the City's Stormwater Management Plan (SWMP) (see Section 4.9.2.3, Local, for more information) because certain water bodies within the City are listed on the Clean Water Act (CWA) Section 303(d) list of Impaired Water Bodies (City of Santa Cruz 2010).

The Porter-Cologne Water Quality Control Act of 1969 is California's statutory authority for the protection of water quality. Under the Act, the State must adopt water quality policies, plans, and objectives that protect the State's waters for the use and enjoyment of the people. The Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans) for all the waters of an area. The water quality control plan is defined as having three components: beneficial uses which are to be protected, water quality objectives which protect those uses, and an implementation plan which accomplishes

those objectives. See Section 4.9.2.2 for additional information about the Porter-Cologne Water Quality Control Act.

The June 2019 Basin Plan for the Central Coastal Basin is the Central Coast RWQCB's current master water quality control planning document (Central Coast RWQCB 2019). The Basin Plan establishes beneficial uses for each of the water bodies in the Central Coast Region. Table 4.9-2 lists the beneficial uses of the primary surface water features located within the project study area.

Table 4.9–2. Basin Plan Beneficial Uses for Water Bodies in Vicinity of Proposed Project

Beneficial Use Designation	Water Bodies			
	San Lorenzo River	*Newell Creek*	*Loch Lomond Reservoir*	*Zayante Creek*
Municipal and Domestic Supply (MUN)	E	E	E	E
Agricultural Supply (AGR)	E	E	E	E
Industrial Process Supply (PROC)	—	—	—	—
Industrial Service Supply (IND)	E	E	E	E
Groundwater Recharge (GWR)	E	E	E	E
Water Contact Recreation (REC-1)	E	E	E	E
Non-contact Water Recreation (REC-2)	E	E	E	E
Wildlife Habitat (WILD)	E	E	E	E
Cold Freshwater Habitat (COLD)	E	E	E	E
Warm Freshwater Habitat (WARM)	—	—	E	—
Migration of Aquatic Organisms (MIGR)	E	E	E	E
Spawning, Reproduction, and/or Early Development (SPWN)	E	E	E	E
Preservation of Biological Habitats of Special Significance (BIOL)	E	—	—	—
Rare, Threatened, or Endangered Species (RARE)	E	—	E	—
Estuarine Habitat (EST)	—	—	—	—
Fresh Water Replenishment (FRSH)	E	E	—	—
Navigation (NAV)	—	—	E	—
Hydropower Generation (POW)	—	E	—	—
Commercial and Sport Fishing (COMM)	E	E	E	E
Aquaculture (AQUA)	—	—	—	—
Inland Saline Water Habitat (SAL)	—	—	—	—
Shellfish Harvesting (SHELL)	—	—	—	—

Note: E = Existing beneficial use.
Source: Central Coast RWQCB 2019.

The Basin Plan includes numerous water quality objectives that apply to all inland surface waters. The primary objectives that would apply to the Proposed Project include those related to turbidity, suspended material, and sediment, as project-related construction could result in erosion and sedimentation of adjacent or downstream water bodies. Sediment- and turbidity-related surface water quality objectives are specified on pages 31 and 40 of the Basin Plan (Central Coast RWQCB 2019). In addition, water quality objectives for oil and grease,

toxicity, chemical constituents, organic chemicals, and inorganic chemicals would apply to the Proposed Project as project-related construction and operation could result in incidental releases of petroleum products and hazardous materials to the environment. Surface water quality objectives associated with these chemicals are specified on pages 31-32 and 38-40 of the Basin Plan (Central Coast RWQCB 2019). While the Porter-Cologne Water Quality Control Act requires the State to adopt water quality policies, plans, and objectives that protect the State's waters, the federal CWA establishes basic guidelines for regulating discharges of both point and non-point sources of pollutants into the waters of the United States.[2] The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA.

CWA Section 303(d) requires states to identify and prepare a list of water bodies that do not meet water quality objectives, and to establish Total Maximum Daily Loads (TMDLs) for each water body to ensure attainment of water quality objectives. These TMDLs are updated every two years in the SWRCB Integrated Report, also known as the Section 305(b) report, which assigns an Integrated Report Condition Category to all assessed water body segments. Water body segments that exceed protective water quality standards are placed on the 303(d) list of impaired waters. Water quality impairments for the water bodies potentially affected by the Proposed Project are identified in Table 4.9-3. These impaired bodies are listed as Category 5 in the SWRCB Integrated Report, which includes waters where at least one beneficial use is not supported, and a TMDL is required.

Table 4.9-3. Water Quality Impairments

Water Body	2014 and 2016 303(d) List of Water Quality Impairments (Included under SWRCB Integrated Report Category 5)
San Lorenzo River	Chlordane, chloride, chlorpyrifos, enterococcus, *Escherichia coli*, fecal coliform, nitrate, polychlorinated biphenyls (PCBs), sedimentation/siltation, sodium, water temperature,
Zayante Creek	Chlorphyrifos, fecal coliform, sedimentation/siltation
Newell Creek	pH, sedimentation/siltation
Loch Lomond Reservoir	None

Source: Central Coast RWQCB 2019.
Notes: PCBs = polychlorinated biphenyls; SWRCB = State Water Resources Control Board.

4.9.1.2 Groundwater Resources

Santa Margarita Groundwater Basin

The Proposed Project is located within the Santa Margarita Groundwater Basin, which is a primary source of water supply for Scotts Valley and the San Lorenzo Valley. It covers over 30 square miles in the Santa Cruz Mountains foothills, forming a triangular area that extends from Scotts Valley to the east, Boulder Creek to the northwest, and Felton to the southwest. The Santa Margarita Basin is a geologically complex area that was formed by the same tectonic forces that created the Santa Cruz Mountains (Kennedy/Jenks Consultants 2018).

[2] Point-source discharges are those emanating from a pipe or discrete location/process, such as an industrial process or wastewater discharge. Non-point source pollutants are those that originate from numerous diffuse sources and land uses, and which can accumulate in stormwater runoff or in groundwater.

The major water purveyors that directly rely on the supply from Santa Margarita Groundwater Basin are Scotts Valley Water District (SVWD), San Lorenzo Valley Water District (SLVWD), and Mount Hermon Association. Santa Margarita Groundwater Basin is also the sole supply source for 13 small water systems and over 1,100 private well users. In addition, the City derives a major portion of its supply from the San Lorenzo River watershed that overlaps the basin (SVWD 2021).

Since the early 1980s, SVWD has actively managed groundwater resources. In 1994, the agency formally adopted a Groundwater Management Plan in accordance with Assembly Bill 3030, also known as the Groundwater Management Act under California Water Code Section 10750. The main goal of the Groundwater Management Plan is to better manage the aquifers providing the community's drinking water through the management of quantity and quality of the groundwater supply.

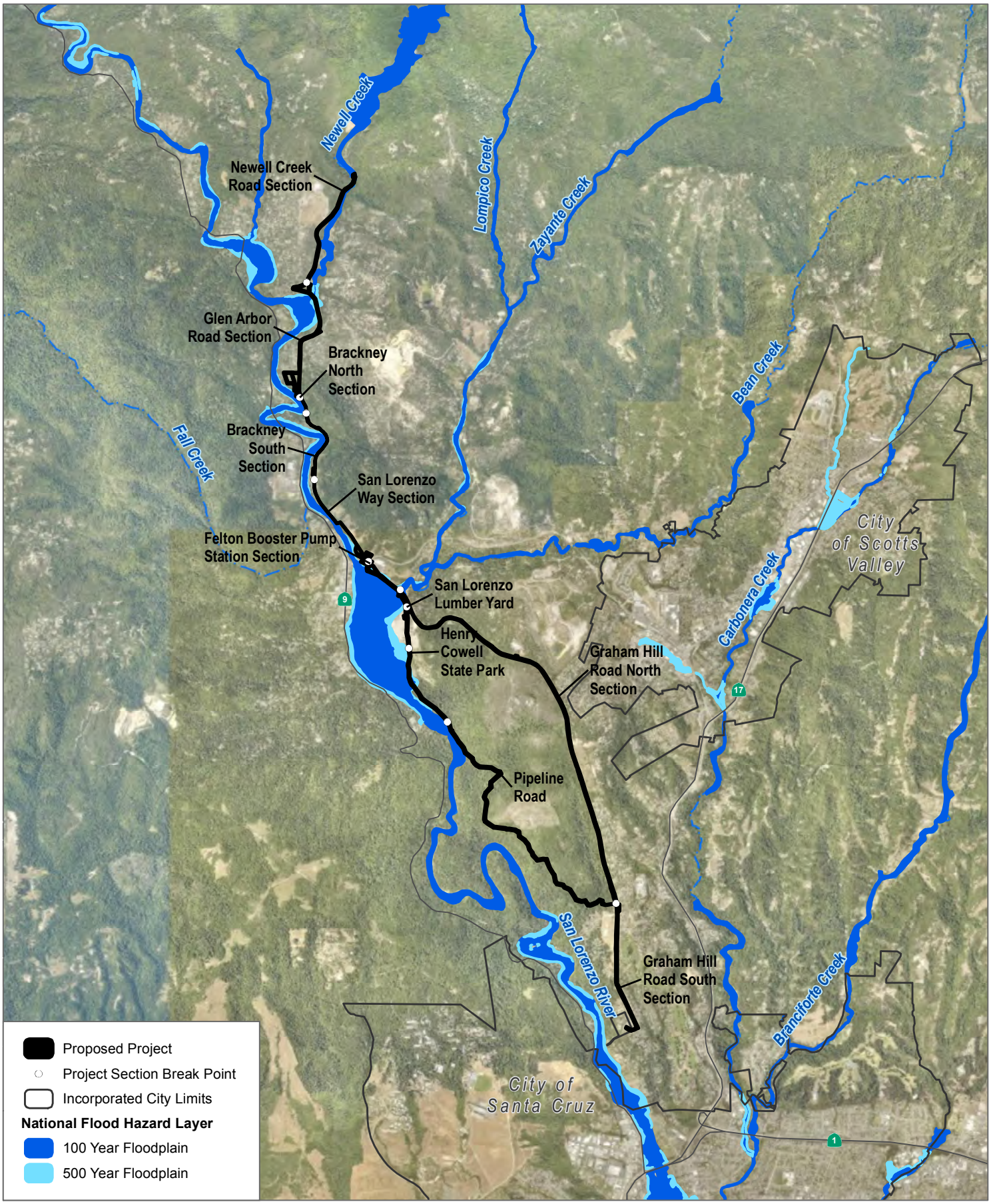
The Santa Margarita Groundwater Agency (SMGWA) is a groundwater sustainability agency that was formed as a Joint Powers Authority to comply with the Sustainable Groundwater Management Act. The SMGWA has three member agencies—SVWD, SLVWD, and the County of Santa Cruz—and is governed by a Board of Directors comprising two representatives from each member agency, one representative from the City of Scotts Valley, one from the City of Santa Cruz, one from Mount Hermon Association, and two private well owner representatives (SMGWA 2021).

The SMGWA is overseeing the preparation of the Santa Margarita Groundwater Sustainability Plan (GSP), which must be completed and submitted to the DWR by 2022 given that the groundwater basin is in the medium to high priority category, but is not subject to critical conditions of overdraft. The SMGWA has drafted three key basin management goals: (1) ensure water supply reliability for current and future beneficial uses, (2) maintain water quality to meet current and future beneficial uses, and (3) prevent adverse environmental impacts. These goals will be re-evaluated as the SMGWA develops its GSP. The public review draft of the GSP for the Santa Margarita Groundwater Basin was released in 2021 with a final version targeted for completion prior to the deadline of January 2022 (SMGWA 2021).

Precipitation is the primary source of groundwater recharge in the basin in the form of direct percolation of precipitation through the soil to groundwater, as well as infiltration from streams. The major groundwater outflows include discharge to streams and springs and groundwater pumping (Kennedy/Jenks Consultants 2018). The decline of groundwater levels in many parts of the basin occurred during 1985 to 2004, representing a loss in groundwater storage in Santa Margarita Groundwater Basin by an estimated 28,000 acre-feet. This loss in groundwater storage resulted in diminished local water supply and reduced sustaining baseflows to local streams that support fishery habitats. As a result of conservation and other management efforts at local water agencies, the total pumping from Santa Margarita Groundwater Basin has decreased by 45% since 1997 (SMGWA 2021).

4.9.1.3 Hydrologic Hazards

Flood mapping by the Federal Emergency Management Agency (FEMA) indicates that the majority of the Proposed Project alignment is not within a Special Flood Hazard Area (100-year flood zone) (FEMA 2021). According to mapping compiled by FEMA, out of the total Proposed Project alignment area, a total of approximately 7.7 acres intersect the 100-year flood zone (i.e., 1% annual chance of flooding) that include areas where no base flood elevation data is known (Zone A) and where it has been estimated (Zone AE). These areas include a portion of Newell Creek and Zayante Creek as shown on Figure 4.9-1.



SOURCE: ESRI Imagry 2021,FEMA 2021, Santa Cruz County 2021

DUDEK

0 0.5 1 Miles

FIGURE 4.9-1

FEMA National Flood Hazards

Newell Creek Pipeline Improvement Project

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There are four reservoir dams located in Santa Cruz County, all within the San Lorenzo Watershed, that are regulated by the State Division of Safety of Dams.[3] These dams include Oak Site Dam, Sempervirens Dam, Soda Lake Dam, and Newell Creek Dam. The latter is within the jurisdiction of the City of Santa Cruz and the remaining are the responsibility of state agencies or private entities. The reservoirs range in size from 20 acre-feet to over 10,000 acre-feet, with the oldest dam being constructed in the late 1890s and the newest in 1985. Three additional state-regulated dams located in neighboring counties also have the potential to affect Santa Cruz County residents and properties should those dams be compromised or catastrophically fail, however the Proposed Project area could only be affected by a release from the Loch Lomond Reservoir (i.e., failure of the Newell Creek Dam).

According to the records maintained by the City of Santa Cruz, there have been no recorded failures at Newell Creek Dam, the only dam owned by the City, and the risk of dam failure is considered low (City of Santa Cruz 2017). Events involving uncontrolled releases of water due to natural and human causes are relatively rare, but have occurred historically, although none of these events involved dam failure and the City has received confirmation as recently as 2016 by the Division of Safety of Dams that the dam is considered safe (City of Santa Cruz 2017).

Seiche waves are seismically induced waves that are produced in an enclosed or semi-enclosed body of water, such as reservoir, which can result in sloshing, wave overtopping, and damage to immediately adjacent structures. The project site is not located adjacent to any enclosed or semi-enclosed body of water as the northern most end of the alignment is approximately 2,000 feet downstream of the Newell Creek reservoir and outside of any potential seiche wave hazard area.

Similarly, the project alignment is located well inland and outside of any tsunami hazard inundation zone located along the coast.

4.9.2 Regulatory Framework

4.9.2.1 Federal

Clean Water Act

The CWA, as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality (33 United States Code Section 1251 et seq.). The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA establishes basic guidelines for regulating discharges of both point and non-point sources of pollutants into the waters of the United States.[4] The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA. Commonly relevant sections of the act are as follows:

- **Sections 303 and 304** provide for water quality standards, criteria, and guidelines. Under Section 303(d) of the CWA, the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. California is required to establish TMDLs for each

[3] There had been five dams, but the Mill Creek Dam was removed in September 2021.

[4] Point-source discharges are those emanating from a pipe or discrete location/process, such as an industrial process or wastewater discharge. Non-point source pollutants are those that originate from numerous diffuse sources and land uses, and which can accumulate in stormwater runoff or in groundwater.

pollutant/stressor. A TMDL defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. Once a water body is placed on the Section 303(d) List of Water Quality Limited Segments, it remains on the list until a TMDL is adopted and the water quality standards are attained, or there is sufficient data to demonstrate that water quality standards have been met and delisting from the Section 303(d) list should take place. TMDLs applicable to the Proposed Project are listed in Table 4.9-3.

- **Section 401 (Water Quality Certification)** indicates that a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a Section 401 water quality certification is issued, verifying compliance with water quality requirements, or waiving such a certification. States where the discharge would originate are generally responsible for issuing water quality certifications. CWA Section 404 permits (see description below) are subject to Section 401 certification.
- **Section 402 (National Pollutant Discharge Elimination System)** establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the SWRCB and the nine RWQCBs, who have several programs that implement individual and general permits related to construction activities, stormwater runoff quality, and various kinds of non-stormwater discharges. The NPDES General Construction Permit is discussed in Section 4.9.2.2, State. In general, in California, a NDPES permit also provides waste discharge requirements, although waste discharge requirements can be issued for discharges that are not within the coverage of the Section 402 NPDES program.

  The Municipal Stormwater Permitting Program under CWA Section 402 regulates stormwater discharges from municipal separate storm sewer systems (MS4s). MS4 permits are issued in two phases: Phase I, for medium and large municipalities, and Phase II for small municipalities. The Phase II Small MS4 General Permit requires the discharger to develop and implement best management practices (BMPs) through a coordinated storm water program with the goal of reducing the discharge of pollutants to the maximum extent practicable, which is the performance standard specified in Section 402(p) of the CWA. See Section 4.9.2.3, Local for the City's Stormwater Management Program.
- **Section 404** (**Discharge of Dredged or Fill Material into Waters of the United States)** establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by the USACE and U.S. Environmental Protection Agency (EPA). Section 4.3, Biological Resources, addresses this requirement in greater detail. A Section 401 water quality certification generally is necessary for a Section 404 permit.

Numerous agencies have responsibilities for administration and enforcement of the CWA. At the federal level, this includes the EPA, USACE, and the major federal land management agencies such as the U.S. Forest Service and Bureau of Land Management. At the state level, with the exception of tribal lands, the California Environmental Protection Agency (CalEPA) and its sub-agencies, including the SWRCB and the nine RWQCBs, have been delegated primary responsibility for administering and enforcing certain provisions of the CWA. At the local level, the Central Coast RWQCB and the County both have enforcement and implementation responsibilities under the CWA.

Federal Antidegradation Policy

The federal Antidegradation Policy (40 Code of Federal Regulations 131.12), first included in EPA's regulations in 1983, is designed to protect water quality and water resources. The policy requires states to develop statewide antidegradation policies and identify methods for implementing those policies. State antidegradation policies and implementation measures must include the following provisions: (1) existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; (2) where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and (3) where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. State permitting actions must be consistent with the federal Antidegradation Policy.

4.9.2.2 State

Porter–Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act (first codified in the California Water Code Section 13000 et seq. in 1969) is the primary water quality control law for California. Whereas the CWA applies to all waters of the United States, the Porter–Cologne Act applies to waters of the state, which includes isolated wetlands and groundwater in addition to federal waters.[5] The act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. For discharges directly to surface water (waters of the United States) from a point source, an NPDES permit is required, which is issued under both state and federal law; for other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (e.g., groundwater and isolated wetlands), waste discharge requirements are issued exclusively under state law. Waste discharge requirements typically require many of the same BMPs and pollution control technologies as NPDES permits.

California Antidegradation Policy

The California Antidegradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California, was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the federal Antidegradation Policy, the California Antidegradation Policy applies to all waters of the state, not just surface waters. The policy requires that, with limited exceptions, whenever the existing quality of a water body is better than the quality established in individual basin plans, such high-quality water must be maintained and discharges to that water body must not unreasonably affect any present or anticipated beneficial use of the water resource. As stated in the Central Coast RWQCB Basin Plan, "discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State."

[5] "Waters of the state" are defined in the Porter–Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code Section 13050[e]).

Water Quality Control Plan for the Central Coastal Basin

The Porter–Cologne Water Quality Control Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans), in which beneficial uses and water quality objectives are established, and which include implementation programs and policies to achieve those objectives (California Water Code Sections 13240 through 13247). Beneficial uses applicable to the Proposed Project are listed in Table 4.9-2. Of particular importance to the Proposed Project is the Basin Plan's water quality objective for turbidity, which states that an "increase in turbidity attributable to controllable water quality factors shall not exceed the following limits:

1. Where natural turbidity is between 0 and 50 nephelometric turbidity units (NTU), increases shall not exceed 20%.
2. Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU.
3. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10%" (Central Coast RWQCB 2019).

Construction General Permit (SWRCB Order No. 2009-0009-DWQ, as Amended)

For stormwater discharges associated with construction activity in the State of California, the SWRCB has adopted and administers the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) to avoid and minimize water quality impacts attributable to such activities. The Construction General Permit applies to all projects in which construction activity disturbs 1 acre or more of soil. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling and excavation. The Construction General Permit requires development and implementation of a stormwater pollution prevention plan (SWPPP), which would specify water quality BMPs designed to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site. Routine inspection of all BMPs is required under the provisions of the Construction General Permit, and the SWPPP must be prepared and implemented by qualified individuals as defined by the SWRCB.

To receive coverage under the Construction General Permit, the project proponent must submit a Notice of Intent and permit registration documents to the SWRCB and applicable RWQCB. Permit registration documents include completing a construction site risk assessment to determine appropriate coverage level; detailed site maps showing disturbance area, drainage area, and BMP types/locations; the SWPPP; and, where applicable, post-construction water balance calculations and active treatment systems design documentation.

Sustainable Groundwater Management Act

In 2014, California enacted the "Sustainable Groundwater Management Act" (California Water Code Sections 10720-10737.8 et seq.) to bring the state's groundwater basins into a more sustainable regime of pumping and recharge. The legislation provides for the sustainable management of groundwater through the formation of local groundwater sustainability agencies and the development and implementation of GSPs. GSPs were required to be submitted to the DWR by January 31, 2020 for all basins designated as high- or medium-priority basins and as basins that are subject to critical conditions of overdraft. GSPs are required to be submitted to the DWR by January 31, 2022 for all other high- or medium-priority basins. GSPs are also encouraged for basins designated as low- and very low priority basins by the SWRCB. As indicated in Section 4.9.1.2, the

SMGWA is overseeing the preparation of the Santa Margarita GSP, which must be completed and submitted to the DWR by 2022, given that the groundwater basin is in the medium to high priority category, but is not subject to critical conditions of overdraft.

California Government Code

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, and transmissions of water supplies are exempt from local (i.e., county and city) building and zoning ordinances. The Proposed Project evaluated in this EIR relate to transmission of water supplies; therefore, these facilities are legally exempt from County of Santa Cruz and City of Santa Cruz building and zoning ordinances.

4.9.2.3 Local

As indicated above, the Proposed Project relates to transmission of water resources and therefore, these facilities are legally exempt from local building and zoning ordinances under California law. The following summaries of local regulations are provided for background information and to provide context to the analysis of regulations applicable to cumulative projects in the project area.

City of Santa Cruz Municipal Codes Regarding Stormwater

In 1998, the City adopted an ordinance, entitled "Stormwater and Urban Runoff Pollution Control," which is Chapter 16.19 of the City's Municipal Code. The ordinance established the legal authority to prohibit illicit connections and pollutant discharges to the City storm drain system. The ordinance also provides the City with the legal authority to conduct inspections and sampling. In addition, the ordinance contains a provision requiring the implementation of BMPs, as published by the Public Works Department, by certain types of facilities. The City also has the authority to terminate illicit connections and discharges, and to initiate enforcement actions for violations of the code. Potential enforcement actions include written notices, citations, termination of discharge, and monetary penalties. The ordinance prohibits non-stormwater discharges to the storm drain system with a few exceptions. The City revised the Stormwater Ordinance in July 2003 to update the ordinance and incorporate new Phase II stormwater regulations. Municipal Code Section 16.19.140 requires that any construction project, including those undertaken under any permit or approval granted pursuant to Titles 15 (Streets and Sidewalks), 18 (Buildings and Construction), and 24 (Zoning) of the City Code, shall implement BMPs, including the City's mandatory BMPs as detailed in the latest BMP manual published by the City's Public Works Department. BMPs are required to be maintained in full force and effect throughout the life of a project.

Title 24 of the Municipal Code includes provisions to ensure that new developments or remodeled sites are designed and constructed in a manner that limits alteration of drainage patterns, prevents erosion, and minimizes long-term impacts on water quality. Chapter 24.14, Environmental Resource Management, contains a section on Conservation Regulations that includes general provisions for drainage and erosion controls. Provisions pertaining to erosion control include requirements that site improvements be fitted to the topography and soil to create the least potential for erosion. Vegetation removal is limited to the amount necessary and according to the project approved erosion control plan.

County of Santa Cruz General Plan and Local Coastal Program

The County of Santa Cruz General Plan and LCP is a comprehensive, long-term planning document for the unincorporated areas of the County and includes the County's LCP, which was certified by the California Coastal Commission in 1994. The County General Plan and LCP provides policies and programs to establish guidelines for future growth and all types of physical developments. The County's certified LCP that applies to activities within the coastal zone is administered by the County Planning Department, pursuant to the California Coastal Act, and includes: (1) the LCP land use plan consisting of the policies and adopted land use, resource, constraint and shoreline access maps and charts contained in the General Plan/LCP document; and (2) the implementing ordinances.

The Proposed Project is not located within the coastal zone in unincorporated Santa Cruz County.

County of Santa Cruz Runoff and Pollution Control Ordinance

Chapter 7.79 of the Santa Cruz County Code addresses runoff and pollution control to protect the health, safety, and welfare of the public by protecting the surface and groundwater quality, groundwater recharge, beneficial uses, marine habitats, watershed health, and ecosystems of the receiving waters of the County, including the Monterey Bay, from discharge of pollutants and the adverse effects of hydromodification, and to comply with Federal and State laws concerning stormwater. This chapter requires compliance with industrial and construction NPDES discharge permits, where relevant. Additionally, prior to issuing a County permit under Title 16, Environmental and Resource Protection, a stormwater pollution control plan must be prepared addressing the use of BMPs during construction, including appropriate BMPs from the County Construction Site Stormwater Pollution Control BMP Manual.

4.9.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to hydrology and water quality. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.9.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to hydrology and water quality are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
B. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
C. Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river or through the addition of impervious surface, in a manner which would: (i)

result in substantial erosion or siltation on or off site; (ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; (iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (iv) impede or redirect flood flows.

D. In flood hazards, tsunami, or seiche zones, risk release of pollutants due to project inundation.

E. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.9.3.2 Analytical Methods

The following analysis considers whether the Proposed Project would directly or indirectly cause hydrologic and water quality impacts, taking into account the City's Standard Construction Practices.

Application of Relevant Standard Construction Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. The Proposed Project includes standard construction practices that would avoid or minimize adverse water quality impacts during construction and operations. These construction practices address indirect impacts on water quality resulting from uncontrolled erosion and fugitive dust, uncontrolled runoff and sedimentation in waterways, and unintended spills of hazardous materials or deposition of trash and include the following: installation of erosion control BMPs (#1); providing stockpile containment and exposed soil stabilizing structures (#2); providing runoff control devices (#3); providing wind erosion controls (#4); locating and stabilizing spoil disposal sites (#5); storing equipment at least 65 feet from active channels to minimize potential hazardous spills (#6 and #7); preventing equipment leaks through regular maintenance (#8); and implementing proper waste/trash management (#9). If the Proposed Project would have potentially significant impacts even with the implementation of the above standard construction practices, the impact analysis identifies mitigation measures.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, if applicable, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.9.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance as described below:

- **Groundwater Impacts and Conflicts with Plans (Significance Thresholds B and E).** The Proposed Project does not require any use of groundwater supplies during the operational phase of the project. Any dewatering necessary in areas where trenchless construction methods may intercept water, if at all, would only be localized and temporary and would be disposed of in accordance with applicable

regulations. Furthermore, there would be no interference with groundwater recharge because the project would not create any substantive new impervious surfaces with the majority of improvements occurring below ground.

The Santa Margarita GSP has not been finalized at the time of this document writing; nonetheless, the Proposed Project would have no impact on groundwater supplies, either through decreases in groundwater availability, through interference with groundwater recharge, or by otherwise conflicting with or obstructing implementation of a sustainable groundwater management plan. The Proposed Project entails the replacement of existing water supply infrastructure and would not inhibit future management of groundwater resources in the Santa Margarita Groundwater Basin. In addition, the Proposed Project would implement Standard Construction Practices that are consistent with local, state and federal regulatory requirements and standard BMPs, which would be consistent with the Central Coast RWQCB Basin Plan.

Therefore, no impact would occur related to groundwater or potential to conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

- **Pollutant Release due to Flood Hazard, Tsunami, or Seiche Zones (Significance Threshold D)**. As discussed above, the majority of the alignment is located outside of the 1% flood hazard zone, and there are no tsunami or seiche hazards in the vicinity of the alignment. The Proposed Project does not include the storage, handling, or disposal of any substantive quantities of hazardous materials as part of operations. Because the Proposed Project would not affect the depth, extent, or frequency of flooding on site or downstream, and would not involve storage of hazardous materials or pollutants, there would be no impact with respect to this criterion.

Project Impacts

Impact HYD-1: Surface Water Quality Standards and Waste Discharge Requirements (Significance Threshold A). Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except for potential inadvertent release of drilling fluids in the Brackney North pipe section. In addition, the Proposed Project would not conflict with or obstruct implementation of a water quality control plan related to surface water. ***(Less than Significant with Mitigation)***

Impacts to water quality through exceedance of water quality standards, non-conformance with waste discharge requirements, or by other means can potentially result from the short-term effects of construction activity (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas, improper handling of hazardous materials) and the long-term effects of operation of the pipeline improvements (e.g., alteration of drainage patterns, use/handling of hazardous materials, and/or increases in impervious surfaces).

Construction

Erosion and Construction-Related Pollutants. The Proposed Project would involve earthwork activities including excavation for pipe trenches and trenchless pits to install the proposed pipeline. The majority of the Proposed Project would be installed using conventional (open cut) trenching methods where subsurface materials are

excavated, temporarily stockpiled in identified staging areas, and hauled off site or backfilled. The Proposed Project would include appropriate site restoration measures following completion of improvements, including stabilization of disturbed soils using erosion controls such as hydroseeding, hand-seeding, and/or restoration plantings, and maintaining pre-construction grading contours.

The primary potential pollutant of concern associated with construction activity is sediment (i.e., high turbidity) generated from site preparation, grading and excavation, and soil stockpile activities that expose soils to potential erosion from the effects of wind or rain. If not properly controlled, potential increases in sedimentation/siltation from construction activities on the site could adversely affect water quality of receiving surface waters. In addition to sediment, other pollutants associated with construction activity could include heavy metals, oil/grease, fuels, debris/trash from construction-related materials, and concrete curing compounds. Sediment can also be a carrier for these pollutants if they are released to soils.

The most intensive soil disturbance would occur during the initial phases of construction where open cut trenching methods would include the use of excavators and loaders to depths of at least 5 feet. The open trench construction method would occur along all proposed pipe sections, except for Brackney North, Brackney South, and a portion of Graham Hill North where trenchless and other construction methods are proposed. The excavated soils would be temporarily stockpiled and potentially evaluated for reuse as backfill. However, it is anticipated that excavated soils would be hauled off site. If temporarily stored, materials would be stored at designated staging areas that are not located in proximity to water bodies. Furthermore, stockpiled soils would be covered and contained in accordance with the Proposed Project Standard Construction Practice #2.

Construction would also occur adjacent to Newell Creek in two locations (Newell Creek Road and Glen Arbor Road pipe sections), although no work is planned within the creek or creek channels. Construction would occur adjacent to Zayante Creek for installation of the proposed pipe over Zayante Creek. Although, there would be no construction within the creek or creek channel, improvement of existing access and installation of a new abutment adjacent to an existing abutment on which the pipe would be placed, would occur immediately adjacent to Zayante Creek. Without adequate erosion controls and other BMPs, inadvertent transport of sediments or equipment fuels into the creek would result in water quality degradation. Trenchless construction methods proposed for the Brackney North and South pipe sections would reduce surface disturbance and prevent construction debris from entering the San Lorenzo River that is downslope of a portion of the alignment, although inadvertent release of drilling fluids could reach the river as reviewed further below.

As part of the City's Standard Construction Practices, which are included in the Proposed Project, the contractor would be required to implement water quality BMPs to avoid or substantially reduce the potential for pollutant contributions to Newell Creek, Zayante Creek and other drainages when construction occurs near these water bodies. The measures address potential sediment transport, erosion and inadvertent release of petroleum products used for equipment. These include the following, which are described in Section 3.6.3 and summarized below:

- Installation of erosion control BMPs consisting of construction site perimeter controls, stabilization of exposed soils and stockpiles, isolating spoil disposal sites and concrete wash sites from waterways or jurisdictional resources, installation of runoff control devices, and periodic inspection of BMPs including after rain events to verify they are functioning as intended and repaired/replaced if necessary (Standard Construction Practices #1 through #3 and #5);
- Implementation of wind erosion (dust) controls (Standard Construction Practice #4);

- Control of hazardous materials in a manner than prevents release to soil or surface water by establishing containment areas a minimum of 65 feet away from the active stream channel, with daily checks for vehicle fuel leaks, provision of spill kits, regular equipment inspections, and use of watertight containers and secondary containment (Standard Construction Practices #6 though #8);
- Keeping a tidy worksite and properly managing waste and trash (Standard Construction Practice #9).

Implementation of these measures would minimize the potential for indirect effects on water quality during construction caused by uncontrolled erosion and fugitive dust by installation of erosion BMPs (e.g., silt fences, fiber roles, covering stockpiles) and wind erosion controls (e.g., watering active construction areas, use of soil binders on exposed areas, covering haul trucks). Uncontrolled runoff and sedimentation in waterways would be minimized by providing runoff control devices along with the installation of erosion BMPs. Construction in or near streams would avoid the active channels. Unintended spills of hazardous materials or deposition of trash would be minimized by storing equipment at a distance from active channels, preventing equipment leaks, and implementing proper waste and trash management.

In addition, the construction contractors would be required to adhere to the NPDES Construction General Permit which mandates preparation and implementation of a SWPPP because the Proposed Project would disturb more than one acre of land. The SWPPP would include detailed BMPs to provide erosion control and hazardous materials measures for all construction activities. Coverage under the Construction General Permit requires a qualified individual (as defined by the SWRCB) to prepare the SWPPP that will address the potential for construction-related activities to contribute to pollutants to any receiving waterways. The SWPPP must describe the type, location, and function of stormwater BMPs to be implemented during construction and must demonstrate that the combination of BMPs selected is adequate to meet the discharge prohibitions, effluent standards, and receiving water limitations contained in the Construction General Permit.

Many of the construction water quality BMPs which are standard for most construction sites subject to the Construction General Permit, overlap with the City's Standard Construction Practices discussed above, but could include:

- Silt fences and/or fiber rolls installed along limits of work and/or the construction work area;
- Stockpile containment and exposed soil stabilization structures (e.g., Visqueen plastic sheeting, fiber rolls, gravel bags, and/or hydroseed);
- Runoff control devices (e.g., fiber rolls, gravel bag barriers/chevrons, etc.) used during construction phases conducted during the rainy season;
- Wind erosion (dust) controls, including use of a water truck;
- Prevention of fluid leaks (equipment inspections and use of drip pans) for construction vehicles;
- Dedicated refueling areas and dedicated storage of hazardous materials;
- Materials pollution management;
- Spill Response Control materials;
- Proper waste/trash management; and
- Regular inspections and maintenance of BMPs.

To obtain coverage under the Construction General Permit, the Proposed Project applicant (i.e., the City or its contractors) would submit to the RWQCB a Notice of Intent and associated permit registration documents, including a SWPPP and site plan, and would obtain a Waste Discharge Identification Number. As part of the process, these BMPs would be refined and/or added to as necessary in the SWPPP to meet the performance standards in the Construction General Permit. In addition, the City developed a Storm Water Management Program (SWMP) to fulfill the requirements of the NPDES General Permit from Small Municipal Separate Storm Sewer Systems (MS4), which include requirements to reduce the amount of pollutants discharged during construction efforts. Relevant to this project, the SWMP covers BMPs for Construction Site Storm Water Runoff Control (E.10) and Post Construction Storm Water Management (E.12). The City's Contractor would be required to use these BMPs for storm water discharge from construction work areas within construction areas within the City, which would be the GHWTP.

With implementation of the City's Standard Construction Practices, the Construction General Permit, and applicable MS4 requirements pertaining to construction erosion control and hazardous materials management, the Proposed Project would have a less-than-significant impact related to water quality standards and waste discharge requirements and would not substantially degrade surface or groundwater quality due to erosion or release of construction-related pollutants.

Potential Release of Drilling Fluids. Construction methods in Brackney North would include horizontal directional drilling (HDD), a trenchless method of installing pipe that involves the use of drilling fluid throughout the operation to transport the cuttings or drilled spoils and stabilize the hole for pipe placement. Construction methods for the Brackney South pipe section could include microtunneling or trenching into bedrock materials. If not conducted appropriately or as a result of unforeseen subsurface conditions, HDD can result in inadvertent drilling fluid release to the ground surface, which occurs when the fluid pressure is greater than the pressure of the surrounding ground. A fluid release could adversely affect receiving waters depending on the characteristics of the release. The closer the HDD borehole lies to a substantial slope, the higher the risk of inadvertent returns on the slope face. For the proposed HDD use for the Brackney North section, the inadvertent fluid return risk is high, as the alignment is relatively close to the slope adjacent to the San Lorenzo River channel, considering the required drilling mud pressures and unknown underground flow paths that might be present. These flow paths could include permeable soils near the HDD exit location, highly fractured rock (e.g., the Ben Lomond Fault Zone), or open rock discontinuities (e.g., rock joints or bedding planes). Inadvertent fluid returns along the San Lorenzo River channel could also indirectly affect water quality through erosion of soils and loose rock along steep slopes, causing a potentially significant impact. However, as discussed in Section 4.6, Geology and Soils, HDD activities would require implementation of Mitigation Measure GEO-2, which requires implementation of an inadvertent fluid return contingency plan that includes both preventative measures and also response measures that can minimize the effects in the unlikely event of a fluid return occurring.

Decommissioning Existing NCP. Abandonment of the existing pipeline would be achieved through injection of either a lightweight cellular grout or controlled low strength material following dewatering of the pipeline. If not managed appropriately, there is a risk of leakage associated with abandonment at segments that are steeply sloped due to high pressure from the injected materials at the lowest end of the pipe segment. However, the potential for leakage would be minimized through controls on the vertical distance between access points (no more than 60 feet), limiting horizontal distances between access points to 1,000 feet for pipe sizes of 20 inches or less, and 800 feet for pipe sizes greater than 20 inches.

The existing pipeline is exposed at a crossing of a tributary to the San Lorenzo River crossing location within the existing Pipeline Road pipe section in Henry Cowell Redwoods State Park. Removal of the segment presents risk of depositing sediment and debris into the stream. However, to minimize any potential for depositing sediment or debris into the river, the pipe segment would be cut at each end where it daylights to install concrete and rebar reinforcement to stabilize the section (Carollo 2021).

Therefore, with implementation of these construction approaches as part of the Proposed Project, the potential impacts to water quality would be less than significant, except for potential release of drilling fluids, which would be a significant impact as discussed above.

Operation and Maintenance

The water quality effects of operation and maintenance of the Proposed Project would not differ substantially from existing conditions because operational aspects of the improved pipeline would not change from what is already occurring under existing conditions. Operations would include continued implementation of pump start-up and valve operations at the FBPS as well as intermittent, periodic inspections and maintenance of air valves with access provided to the pipeline sections by existing roads and easements. The Brackney North pipeline section likely would have isolation and air valves on either end of the new pipeline and would not need to be accessed in the future unless removed for replacement. Other periodic maintenance activities include inspection and maintenance of existing culverts and other drainage features, however no new paved areas would be created that could become a source of polluted runoff. Therefore, during operation, the Proposed Project would have a less-than-significant impact with respect to water quality standards or waste discharge requirements and would not substantially degrade surface or groundwater quality.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to water quality, except for potential release of inadvertent release of drilling fluids during HDD trenchless construction methods proposed for the Brackney North pipe section. Implementation of Mitigation Measure GEO-2 (HDD Inadvertent Fluid Return Plan) that is included in Section 4.6, Geology and Soils, would reduce the potentially significant impact to a less-than-significant level.

Impact HYD-2: Alteration of Drainage Patterns (Significance Threshold C). The Proposed Project would not 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; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows. ***(Less than Significant)***

As discussed under Impact HYD-1, the Proposed Project would consist primarily of installation of a new subsurface pipeline and would not substantially affect drainage patterns or hydraulics of existing surface waters within the Proposed Project area. Some improvements including creek crossings would involve above ground improvements; however, they do not involve creating any substantive new impervious surfaces. The

highest potential for erosion or transport of silt would occur during construction, which as discussed above in Impact HYD-1, would be addressed by implementation of the City's Standard Construction Practices and the Construction General Permit requirements pertaining to construction erosion control. Once construction is complete, disturbed areas would be restored and drainage patterns throughout the project area would largely remain the same as existing conditions. Implementation of the Proposed Project would not substantively increase the rate or amount of surface runoff nor exceed the capacity of existing or planned stormwater drainage systems. The potential for creating additional sources of polluted runoff is discussed in Impact HYD-1. Therefore, the Proposed Project would result in a less-than-significant impact with respect to alteration of drainage patterns.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to alteration of drainage patterns, and therefore, no mitigation measures are required.

4.9.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative hydrology and water quality impacts associated with the Proposed Project and other reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analysis, and as relevant to this topic. The geographic area of analysis for cumulative hydrology and water quality impacts includes other cumulative projects that could result in direct or indirect impacts to project site watersheds and underlying groundwater basins, Zayante Creek, Newell Creek or San Lorenzo River. The cumulative projects within the same geographic area as the Proposed Project are several City water CIP projects: two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project) and improvements at Tait Diversion. Other cumulative projects include the Newell Creek Dam Inlet/Outlet Improvement Project and San Lorenzo Way Bridge Replacement, both of which would be completed prior to completion of the Proposed Project.

The Proposed Project would not contribute to cumulative impacts related to groundwater (Significance Threshold B), release of pollutants due to inundation by flood, tsunami, or seiche (Significance Threshold D), or conflicts with plans (Significant Threshold E) because it would have no impact related to these thresholds, as described above. Therefore, these significance thresholds are not further evaluated.

Impact HYD-3: Cumulative Water Quality Impacts (Significance Thresholds A and C). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to water quality or alteration of drainage patterns. ***(Less than Significant)***

Potential soil erosion and water quality degradation from cumulative project sites could combine to cause potentially significant cumulative water quality impacts due to sedimentation of downstream water bodies. Cumulative development and redevelopment within the watersheds identified for the cumulative projects would potentially result in short-term erosion related impacts during construction and long-term erosion related to denuded soil, improper drainage, and lack of erosion control features at each cumulative project site. Similarly, incidental spills of petroleum products and hazardous materials during construction at each cumulative project site could occur during construction, resulting in cumulative water quality impacts.

However, short-term and long-term erosion BMPs and spill control BMPs would be employed at each site consistent with NPDES stormwater quality regulations, including the Construction General Permit and local MS4 permits. As described above, the impacts of the Proposed Project would be limited to potential water quality impacts during construction, which would mostly be less than significant through application of the City's Standard Construction Practices. In addition, the Proposed Project would have less than significant impacts related to alteration of drainages due to the predominantly below-grade nature of the pipe and limited addition or replacement of impervious surfaces. The impacts of the Proposed Project on hydrology and water quality would be temporary during construction and localized to the site, and upon completion of construction, there would be no operational impacts related to alteration of drainage or water quality. While the Proposed Project could potentially result in a significant water quality impact related to inadvertent release of drilling fluids, there are no other projects that would contribute to this impact, and thus, there would be no cumulative impact. Therefore, the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects would result in less-than-significant cumulative impacts to hydrology and water resources.

4.9.4 References

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4.10 Noise and Vibration

This section describes the existing noise conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to construction of the of the Newell Creek Pipeline (NCP) Project (Proposed Project). The analysis is based on noise modeling conducted for the Proposed Project as part of the preparation of this environmental impact report (EIR). The results of the noise modeling are summarized in this section, and are included in Appendix D.

A summary of the comments received during the scoping period for this EIR is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to noise.

4.10.1 Background

4.10.1.1 Acoustic Fundamentals

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise; consequently, the perception of sound is subjective in nature, and can vary substantially from person to person. Common sources of environmental noise and relative noise levels are shown in Table 4.10-1.

Table 4.10-1. Typical Noise Levels Associated with Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at 3 feet		
	90	
Diesel Truck at 50 feet, 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher (in next room)
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing (Healthy)	0	Lowest Threshold of Human Hearing (Healthy)

Source: Caltrans 2020a.
Notes: dBA = A-weighted decibels; mph = miles per hour.

A sound wave is initiated in a medium by a vibrating object (e.g., vocal cords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in Hertz (Hz), which is equivalent to one complete cycle per second.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and to have a more useable numbering system, the decibel (dB) scale was introduced. Sound level expressed in decibels (dB) is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure and the second pressure being that of the sound source of concern. For sound pressure in air, the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65-dB source of sound, such as a truck, when joined by another 65-dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100-fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted decibels (dBA). For this reason, the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (transportation) such as automobiles, trucks, and airplanes, and stationary sources (non-transportation) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (e.g., walls, building façades, berms). Noise generated from mobile sources generally attenuate at a rate of 3 dB (typical for hard surfaces, such as asphalt) to 4.5 dB (typical for soft surfaces, such as grasslands) per doubling of distance, depending on the intervening ground type. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 dB to 7.5 dBA per doubling of distance for hard and soft sites, respectively.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, or intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or “shielding” provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as earthen berms, hills, or dense woods as well as built features such as buildings, concrete berms and walls may be effective barriers for the reduction of source noise levels.

4.10.1.1 Noise Descriptors

The intensity of environmental noise levels can fluctuate greatly over time and as such, several different descriptors of time-averaged noise levels may be used to provide the most effective means of expressing the noise levels. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment near the receptor(s). Noise descriptors most often used to describe environmental noise are defined as follows:

- **L_{max} (Maximum Noise Level):** The maximum instantaneous noise level during a specific period of time.
- **L_{eq} (Equivalent Noise Level):** The average noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq} In noise environments determined by major noise events, such as aircraft over-flights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.
- **L_{dn} (Day-Night Average Noise Level):** The 24-hour L_{eq} with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 PM and 7 AM In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- **CNEL (Community Noise Equivalent Level):** The CNEL is similar to the L_{dn} described above, but with an additional 5-dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7 PM and 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. When the same 24-hour noise data are used, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

Community noise is commonly described in terms of the ambient noise level which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent sound level (L_{eq}) which corresponds to the steady-state A-weighted sound level containing the same total energy as the time-varying signal over a given time period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise. Use of these descriptors along with the maximum noise level occurring during a given time period provides a great deal of information about the ambient noise environment in an area.

4.10.1.2 Negative Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The majority of research

infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustomed to, the less tolerable the new noise source will be to an individual.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is generally imperceptible outside of a laboratory environment, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Egan 1988). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state, pure tones or broad-band noise and to changes in levels of a given noise source. Perception and reaction to changes in noise levels in this manner is thought to be most applicable in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

4.10.1.3 Vibration Fundamentals

Vibration is similar to noise in that it is a pressure wave traveling through an elastic medium involving a periodic oscillation relative to a reference point. Vibration is most commonly described in respect to the excitation of a structure or surface, such as in buildings or the ground. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions, impacts). Vibration levels can be depicted in terms of amplitude and frequency; relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal, or the quantity of displacement measured from peak to trough of the vibration wave. RMS is defined as the positive and negative statistical measure of the magnitude of a varying quantity. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a period of one second. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2018). PPV and RMS vibration velocity are nominally described in terms of inches per second (in/sec). However, as with airborne sound, vibration velocity can also be expressed using decibel notation as vibration decibels (VdB) with a reference quantity of 1 micro-inch per second. The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration and allow for the presentation of vibration levels in familiar terms.

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. Human response to vibration has been found to correlate well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity.

Typical outdoor sources of perceptible groundborne vibration include construction equipment, steel-wheeled trains, and vehicles on rough roads. Although the effects of vibration may be imperceptible at low levels, effects may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the elevated levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to structural components. The range of vibration relevant to this analysis occurs from approximately 60 VdB, which is the typical background vibration-velocity level; to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings (FTA 2018). Table 4.10-2 identifies some common sources of vibration, corresponding VdB levels, and associated human perception and potential for structural damage.

Table 4.10-2. Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (re 1 µ-inch/sec, RMS)	Typical Events (50-foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
—	95	Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, occasional events	75	Commuter rail, typical bus or truck over bump or on rough roads
Residential annoyance, frequent events	72	Rapid transit, typical
Approximate human threshold of perception to vibration	65	Buses, trucks, and heavy street traffic
—	60	Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	—

Source: FTA 2018.
Notes: µ-inch/sec = micro-inch per second; re = in reference to; RMS = root-mean-square; VdB = vibration decibels.

4.10.2 Existing Conditions

4.10.2.1 Sensitive Noise Receptors

Certain land uses are particularly sensitive to noise, such as those where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of the land use. Noise-sensitive land uses can include schools, hospitals, care facilities, educational facilities, places of reflection or worship, and residential uses. Residential dwellings are of primary concern because of the potential for increased and

prolonged exposure of individuals to both interior and exterior noise levels, especially during evening and nighttime hours when occupants would typically be relaxing or resting.

Existing noise-sensitive land uses are located throughout the proposed project area and include single-family residential, multi-family residential, educational facilities and places of reflection and worship as shown on Figures 4.10-1A and 4.10-1B. The environments in which the existing noise-sensitive land uses are located range from quiet rural mountain settings, to more populated semi-suburban areas. Some residences are within 20 feet of the construction disturbance area in the northern segment and 20-50+ feet from the construction disturbance area in the southern segment.

Several schools and a day care facility are within 0.25 mile of the Project alignment. The Mountain Monsters Daycare is approximately 0.1 mile east of the proposed alignment. San Lorenzo Valley Elementary School, San Lorenzo Valley Middle School, and San Lorenzo Valley High School are approximately 0.2 mile west of the proposed pipeline alignment in Felton. The Santa Cruz County Juvenile Hall and Community School is immediately east of the pipeline route along Graham Hill Road, southeast of Felton, and Brook Knoll Elementary School is approximately 0.2 mile east of the pipeline route along the southern portion of Graham Hill Road.

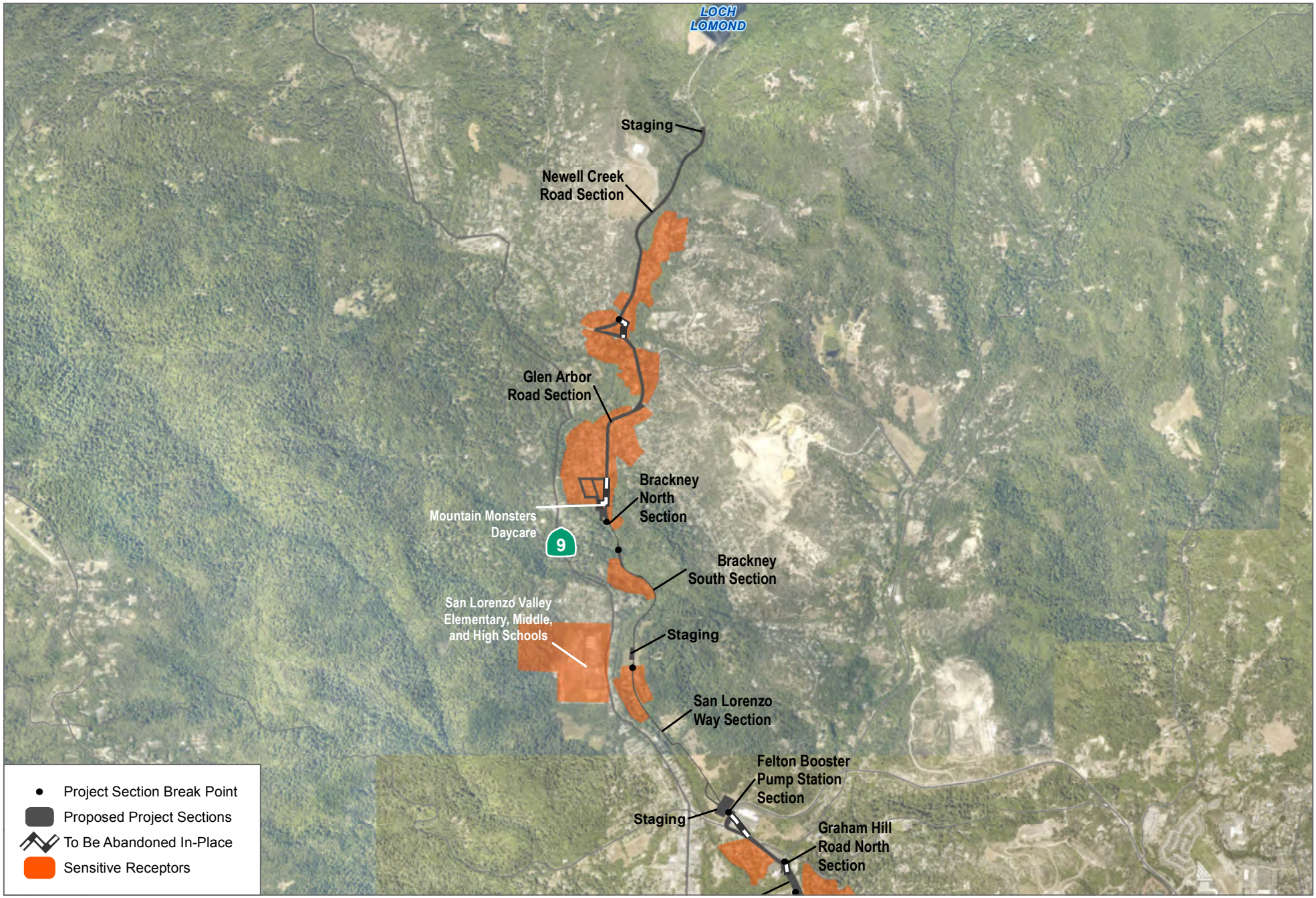
4.10.2.2 Existing Ambient Noise Measurements

Dudek staff visited the length of the Proposed Project on May 7 and 11, 2021 to measure ambient sound levels in the vicinity of the Project segments and at measurement locations representative of existing noise-sensitive receptors. Sound level measurements were performed at eleven (11) locations adjacent to the Proposed Project. Short-term sound level measurements were conducted with a Rion NL–62 precision integrating sound level meter, placed on a tripod with the microphone positioned approximately 5 feet above the ground. The short-term measurements were 10 minutes in duration at all locations, with the sound level meter configured to use A-weighting and a "slow" response time setting. Figure 4.10-2 shows the measurement locations. Table 4.10-3 presents the results of the short-term sound level measurements.

Table 4.10-3. Short-Term Sound Level Measurements

Site	Description	Time	L_{eq} (dBA)	L_{max} (dBA)	L_{90} (dBA)
ST1	Newell Creek Rd., north of Glen Arbor Rd.	5/11/2021 3:04 PM	43.7	60.3	33.2
ST2	Caledonium Ave., south of Glen Arbor Rd.	5/11/2021 2:39 PM	58.0	74.4	36.6
ST3	East of the eastern end of Brackney Rd.	5/7/2021 4:59 PM	42.5	55.7	38.5
ST4	Graham Hill Rd. northwest of the Zayante Creek crossing	5/7/2021 4:30 PM	44.5	57.3	37.0
ST5	Graham Hill Rd. traffic, at Roaring Camp Rd.	5/7/2021 4:06 PM	64.6	79.5	50.8
ST6	Grandview Ave., north of Graham Hill Rd.	5/7/2021 3:37 PM	56.7	70.0	45.1
ST7	Graham Hill Rd. traffic north of Lockwood Ln.	5/7/2021 3:13 PM	66.7	78.7	48.1
ST8	Bobs Ln. at Worth Ln.	5/11/2021 4:32 PM	41.7	50.7	38.3
ST9	Western end of Geneva Ct.	5/11/2021 4:56 PM	48.3	59.2	39.7
ST10	Graham Hill Rd. traffic north of Treetop Dr.	5/7/2021 2:40 PM	67.7	77.8	42.6
ST11	Graham Hill Rd. traffic, at GHWTP driveway	5/7/2021 2:03 PM	69.5	81.7	44.8

Notes: ST = short-term; dBA = A-weighted decibel; L_{eq} = equivalent noise level (time-averaged sound level); L_{max} = maximum sound level; L_{90} = the sound level exceeded 90% of the time, approximates the background ambient sound level.



SOURCE: ESRI Imagery 2021, County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

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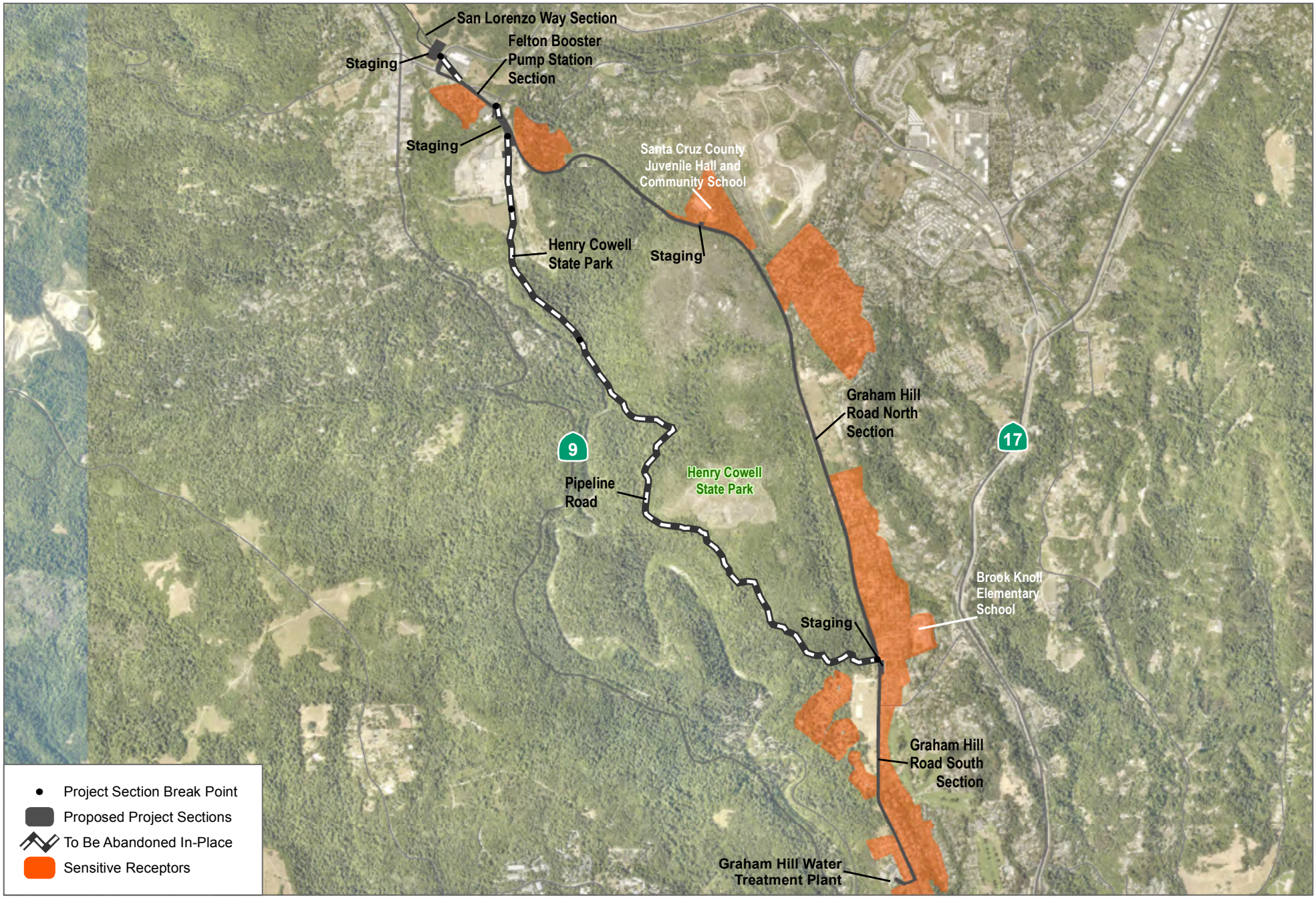
0 1,500 3,000 Feet

FIGURE 4.10-1A

Sensitive Receptors - Northern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: ESRI Imagery 2021, County of Santa Cruz 2020, City of Santa Cruz Water Department 2020, USGS 2020

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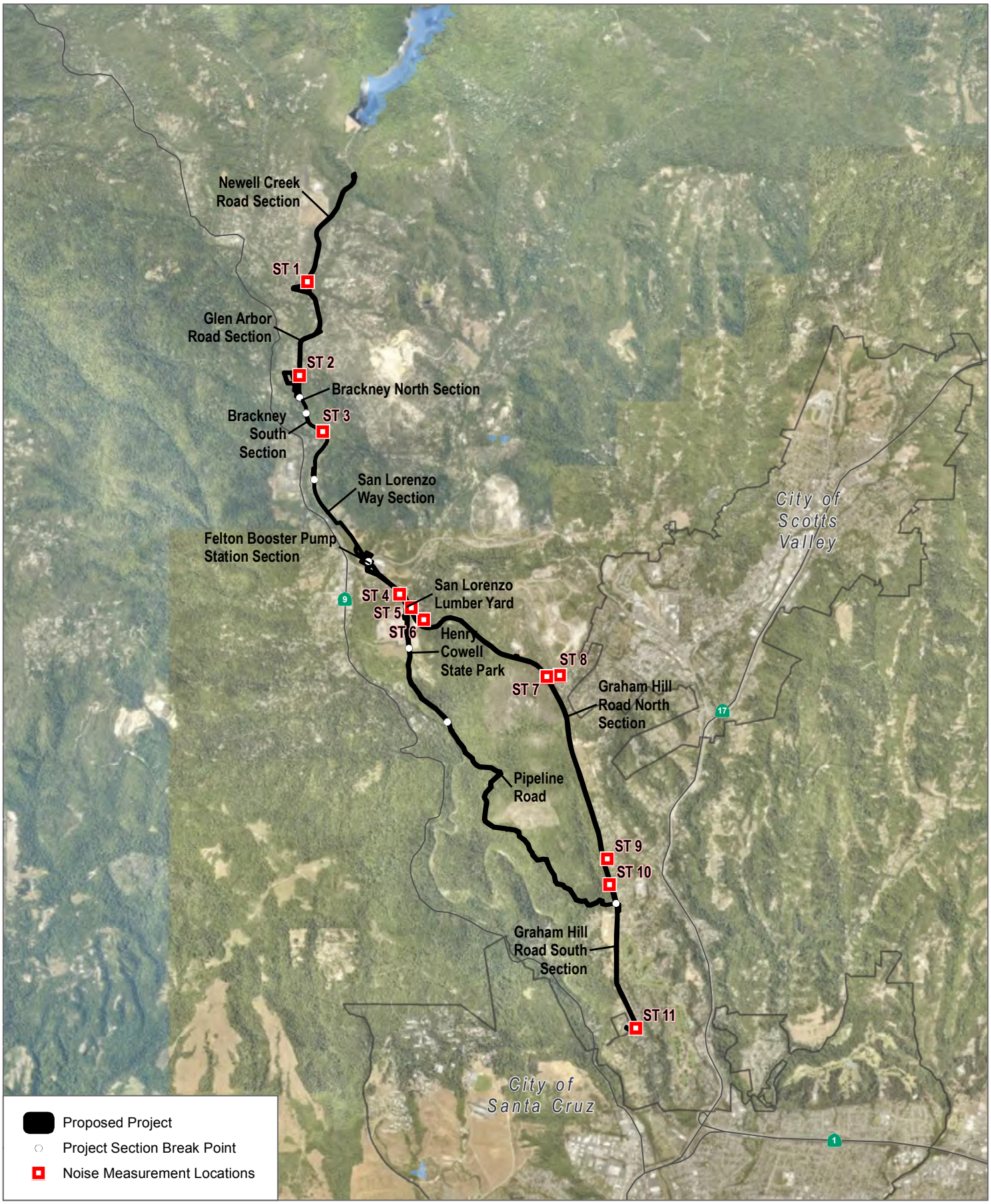
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FIGURE 4.10-1B

Sensitive Receptors - Southern Segment

Newell Creek Pipeline Improvement Project

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SOURCE: ESRI Imagry 2021, CAL FIRE 2020, Santa Cruz County 2021

DUDEK

FIGURE 4.10-2

Noise Measurement Locations

Newell Creek Pipeline Improvement Project

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Short-term measurement location ST-1 documented existing traffic noise level at the edge of the Newell Creek Rd. right-of-way, an approximate setback distance of 25 feet from the Newell Creek Rd. centerline, with an approximate noise level exposure of 44 dBA L_{eq}. Short-term measurement location ST-2 documented existing traffic noise level south of the intersection of Caledonium Ave and Glen Arbor Rd, an approximate distance of 105 feet from the Glenn Arbor Rd. centerline, with an approximate noise level exposure of 58 dBA L_{eq}.

Short-term measurement locations ST4, ST5, ST7, ST10 and ST11 documented existing traffic noise levels along Graham Hill Road, at similar distances from the centerline of the roadway to the façade of nearby receptors exposed to the traffic noise. Existing traffic noise levels were recorded to range from approximately 65 to 70 dBA L_{eq} with setback distances of 50 to 70 feet to the Graham Hill Rd. centerline. As the majority of the proposed project construction activities would take place within the roadway easement, the existing traffic noise level exposure at noise-sensitive receptors adjacent to the roadways are considered representative of these short-term measurement locations.

Short-term noise level measurement locations ST3, ST6, ST8 and ST9 are representative of the noise-sensitive receptors located further within the residential neighborhoods adjacent to the Proposed Project alignment. Ambient noise levels cataloged at the measurement locations representing the noise-sensitive residential neighborhoods ranged from approximately 42 to 57 dBA L_{eq}, with maximum noise levels ranging from approximately 51 to 70 dBA L_{max}. Existing ambient noise levels at the measurement locations were primarily affected by traffic on Graham Hill Rd, with the noise level exposure being proportional to the distance of the noise-sensitive receptors to the roadway and any noise level reductions provided by natural and man-made intervening elements (buildings, topography, dense foliage, etc.).

4.10.2.3 Existing Sources of Noise

The Proposed Project is located in suburban and rural foothills areas of the County. The character of the ambient noise environment varies from quiet rural areas to small in-town areas with neighborhood commercial and minor industrial areas. Common sound sources in the project vicinity include traffic, general community sounds, mechanical noise, and the natural environment. The primary noise sources affecting the Proposed Project are described below.

Aircraft Noise

During the noise monitoring survey, no aircraft were observed. The Proposed Project is not located within any adopted 60 or 65 dB CNEL/L_{dn} airport noise contours. The nearest airport to the Proposed Project is the Bonny Doon Village Airpark, which is a privately owned airstrip approximately 2.5 miles west of the Brackney North and South pipe sections. As such, noise associated with existing and future aircraft operations in the area is not a substantial contributor to the ambient noise environment.

Roadway Traffic Noise

Existing traffic noise levels were modeled for roadway segments in the study area based on the Federal Highway Administration (FHWA) Highway Traffic Noise Model (TNM) prediction methodologies (FHWA 1998), traffic volume data from Santa Cruz County (County of Santa Cruz 2016) and the California Department of Transportation (Caltrans 2019). The FHWA TNM incorporates sound emissions and sound propagation algorithms based on well-established theory and accepted international standards. The acoustical algorithms

contained within the FHWA TNM have been validated with respect to carefully conducted noise measurement programs and show excellent agreement in most cases for sites with and without noise barriers. The noise modeling accounted for factors as vehicle volume, speed, vehicle type, roadway configuration, distance to the receiver, and propagation over different types of ground (acoustically soft and hard ground).

Modeled existing traffic noise levels are summarized in Table 4.10-4, at a representative distance of 100 feet from the centerline of each major roadway in the study area and distances from roadway centerlines to the 60-dBA, 65--dBA, and 70-dBA L_{dn} traffic noise level contours. The location of the 60-dBA L_{dn} traffic noise contour along the local roadway network ranges from within the right-of-way to approximately 230 feet from the centerline of the modeled roadways. The extent to which existing land uses in the study area are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise. Refer to Appendix D of this report for complete modeling inputs and results.

Table 4.10-4. Summary of Modeled Existing Traffic Noise Levels

Roadway	Segment		ADT	L_{dn} at 100 feet	Distance to L_{dn} Contour from Centerline of Roadway (feet)		
	From	*To*			*70 dBA*	*65 dBA*	*60 dBA*
Graham Hill Rd	Hwy 9	Mt Hermon Rd	27,896	65.4	49	107	230
Graham Hill Rd	Mt Hermon Rd	Lockwood Ln	6,749	59.3	19	41	89
Glen Arbor Rd	Hwy 9	Glen Arbor Rd	4,337	54.5	9	20	43
State Highway 9			21,727	61.9	42	90	194

Notes: ADT = average daily traffic; dBA = A-weighted decibels; L_{dn} = average day-night noise level.
Not accounting for shielding provided by natural or man-made intervening objects. Actual distance to real-world noise level contours will be dependent upon shielding effects in the environment under consideration.

Vibration

Transportation-related vibration from roadways in the study area is the primary source of groundborne vibration. Heavy truck traffic can generate groundborne vibration, which varies considerably depending on vehicle type, weight, and pavement conditions. However, groundborne vibration levels generated from vehicular traffic are not typically perceptible outside of the roadway right-of-way (Caltrans 2020).

4.10.3 Regulatory Framework

4.10.3.1 Federal

Federal Noise Control Act

The U.S. Environmental Protection Agency's (EPA's) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, the EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to state and local

governments. However, noise control guidelines and regulations contained in the EPA rulings in prior years are still adhered to by designated federal agencies where relevant. No federal noise regulations are applicable to the Proposed Project.

4.10.3.2 State

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation.

Governor's Office of Planning and Research General Plan Guidelines

The Governor's Office of Planning and Research (OPR), published the State of California General Plan Guidelines (OPR 2003), which provides guidance for the acceptability of projects within specific L_{dn} contours. Table 4.10-5 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to help craft noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 4.10-5. Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA L_{dn})			
	Normally Acceptable[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multifamily	<65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	<65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters	—	<70	65+	—
Sports Arena, Outdoor Spectator Sports	—	<75	70+	—
Playgrounds, Neighborhood Parks	<70	—	67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75	—	70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	—
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	—

Source: OPR 2003.

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level.

1 Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

2 New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

3 New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

4 New construction or development should generally not be undertaken.

Generally, residential uses (e.g., single-family homes, mobile homes, etc.) are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55 to 70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA L_{dn} and normally unacceptable in areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas up to 70 dBA L_{dn}. Between 67.5 and 77.5 dBA L_{dn}, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements.

California Department of Transportation Guideline Vibration Damage Threshold

There are no state standards for vibration; however, California Department of Transportation (Caltrans) compiled a synthesis of research on the effects of vibration with thresholds ranging from 0.08 in/sec PPV to 4.0 in/sec PPV for "fragile historic buildings" and "structures of substantial construction," respectively. Based on the synthesis of research, Caltrans developed recommendations for guideline threshold criteria of 0.3 in/sec PPV for older residential structures and 0.25 in/sec PPV for historic buildings and some old buildings exposed to continuous/frequent intermittent sources. For extremely fragile historic buildings, ruins, and ancient monuments, Caltrans recommends a threshold of 0.08 in/sec PPV (Caltrans 2020b).

4.10.3.3 Local

County of Santa Cruz General Plan

The County of Santa Cruz General Plan Noise Element, Chapter 9 (County of Santa Cruz 2020b) contains updated goals, objectives, and policies intended to protect citizens from exposure to excessive noise. The Noise Element establishes standards and policy to promote compatible noise environments for new development or redevelopment projects and to control excessive noise exposure of existing land uses. The following applicable policies and standards are considered in the noise analysis for the Proposed Project.

Objective 9.2 Noise Exposure of Existing Sensitive Uses and Receptors

Minimize exposure of existing noise-sensitive land uses and receptors to excessive, unsafe or disruptive noise that may be generated by new land uses and development projects.

Policies

9.2.1 Require acoustical studies for all new development projects that may affect the existing noise environment affecting sensitive land uses and receptors and that may not conform to the Normally Acceptable Noise Exposure in Table 9-2 (Table 4.10-6 in this EIR).

9.2.2 Require site-design and noise reduction measures for any project, including transportation projects that would cause significant degradation of the noise environment due to project effects that could:

(a) Increase the noise level at existing noise-sensitive receptors or areas by 5 dB or more, where the post-project CNEL or DNL will remain equal to or below 60 dB;

(b) Increase the noise level at existing noise-sensitive receptors or areas by 3 dB or more, where the post-project CNEL or DNL would exceed 60 dB.

This policy shall not be interpreted in a manner that would limit the ability of the County to require noise related mitigation measures or conditions of approval for projects that may generate lesser increases

than the above. Special consideration may also be applied to special events or activities subject to permit requirements, or to land use development permits for uses and activities exempted from County noise control regulations.

9.2.6 Require mitigation and/or best management practices to reduce construction noise as a condition of project approvals, particularly if noise levels would exceed 75 dBA at neighboring sensitive land uses or if construction would occur for more than 7 days.

Table 4.10-6. Acceptable through Unacceptable Ranges of Noise Exposure by Land Use

Land Use		Community Noise Exposure DNL or CNEL dB(A)					
		55	*60*	*65*	*70*	*75*	*80*
A	Residential/Lodging – Single Family, Duplex, Mobile Home, Multi Family						
B	Schools, Libraries, Religious Institutions, Meeting Halls, Hospitals						
C	Outdoor Sports Arena or Facility, Playgrounds, Neighborhood Parks						
D	Office Buildings, Business Commercial and Professional						
E	Industrial, Manufacturing, Utilities, Agriculture						

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements, and can meet the indoor noise standards.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design to meet interior and exterior noise standards, where applicable.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design to meet interior and exterior noise standards, where applicable.

Unacceptable: New construction or development should generally not be undertaken.

Source: County of Santa Cruz 2020a, Table 9-2.
Note: Outdoor noise exposure measured at the property line of receiving land use.

Santa Cruz County Code

The Santa Cruz County Code contains additional guidance with the intent to control noise, to promote and maintain the health, safety and welfare of its citizens. Chapter 8.30 of the Santa Cruz County Code enumerates general standards, limitations and exemptions pertaining to noise within the County. Additionally, Chapter 13.15 institutes "Noise Planning", which codifies General Plan policies and aids in regulating noise throughout the County through land use planning and permitting. The regulations presented below are considered, where relevant, in the noise analysis for the Proposed Project.

8.30.10 Offensive Noise

(A) No person shall make, cause, suffer, or permit to be made any offensive noise.

(B) "Offensive noise" means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

(C) The following factors shall be considered when determining whether a violation of the provisions of this section exists:

(1) Loudness (Intensity) of the Sound.

(a) Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 AM and 10:00 PM and it is:

(i) Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data. A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(b) Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 PM and 8:00 AM and it is:

(i) Made within 100 feet of any building or place regularly used for sleeping purposes; or

(ii) Clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or

(iii) In excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data. A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(2) Pitch (frequency) of the sound, e.g., very low bass or high screech;

(3) Duration of the sound;

(4) Time of day or night;

(5) Necessity of the noise, e.g., garbage collecting, street repair, permitted construction activities;

(6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and

(7) The proximity to any building regularly used for sleeping purposes.

City of Santa Cruz General Plan

Applicable noise standards in the City of Santa Cruz General Plan are contained within Chapter 8 of the General Plan (Hazards, Safety, and Noise) (City of Santa Cruz 2012). The Hazards, Safety, and Noise chapter contains specific goals, policies, and standards for use in planning and land compatibility determinations within the City of Santa Cruz. In particular, the Hazards, Safety, and Noise chapter establishes noise/land-use compatibility standards which are applicable to all new residential, commercial, and mixed-use projects (Figure 2 of the Hazards, Safety, and Noise chapter and Goal HZ3.2.1), and the General Plan seeks to ensure that noise standards are met in the siting of noise-sensitive uses (Goal HZ3.2).

The Hazards, Safety, and Noise chapter policies establish a maximum interior noise level threshold of 45 dBA L_{dn} for all residential uses, consistent with California noise insulation standards. Figure 2 of the Hazards, Safety, and Noise chapter indicates that exterior noise levels up to 60 dBA L_{dn} are normally acceptable for residential development and exterior noise levels up to 65 dBA L_{dn} are normally acceptable for multi-family residential and transient residential development; with noise levels up to 70 dBA L_{dn} considered conditionally acceptable. Hazards, Safety, and Noise chapter Policy HZ3.2.3 reiterates the "noise level target" of 65 dBA L_{dn} for outdoor activity areas associated with new multi-family residential developments. Policies HZ3.1.3 and HZ3.1.5 qualitatively discuss the management and monitoring of construction noise levels to minimize noise impacts on surrounding land uses.

City of Santa Cruz Municipal Code

Chapters 9.36 and 24.14 of the City of Santa Cruz Municipal Code (City of Santa Cruz 2020) include provisions for noise regulations. The former prohibits excessive noise during nighttime hours (10:00 PM through 8:00 a.m.) (Section 9.36.010, Subsection(a)), but without any quantitative (numerical) limits. For the purposes of construction activities performed in support of public works, the nighttime noise restriction shall not apply during the hours of 7:00 AM to 8:00 AM

Subsection (d) of Chapter 9.36 states that "Subsection (a) shall not apply to any person engaged in performance of a contract for public works awarded by the City of Santa Cruz, in the event of an emergency and if the city manager of the City of Santa Cruz so authorizes work."

Subsection (e) of Chapter 9.36 allows for specific construction activities to occur between the hours of 10:00 PM and 8:00 AM where either the chief building inspector, public works director, planning and community development director or water department director have provided written determination and consent that said task is required commence or be completed between said hours.

Section 9.36.025 states "This chapter shall not apply to refuse collection, recyclable collection or street sweeping activities undertaken by, or pursuant to contract with, the city of Santa Cruz. Similarly, this chapter shall not apply to any other activity undertaken by the city, another governmental agency, or city contractor, for public health and safety purposes when, in the judgment of the city or governmental agency, such activity cannot be undertaken effectively or efficiently in compliance with the regulations set forth in this chapter.

In addition to the Chapter 9.36 regulations, Section 24.14 describes performance standards which limit noise production with respect to noise production from residential and commercial/industrial land uses: up to a 5 dB or 6 dB increase, respectively, above existing outdoor ambient sound levels.

4.10.4 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to noise. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.10.4.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to noise are based on past and current versions of Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines. A significant impact would occur if the Proposed Project would:

A. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

B. Result in 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.

C. Result in excessive groundborne vibration or groundborne noise levels.

D. Expose people residing or working in the project area to excessive noise levels in 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 2 miles of a public airport or public use airport.

In analyzing noise and vibration impacts associated with the Proposed Project, pertinent noise standards introduced in Section 4.10.3.3, Local, for the County of Santa Cruz and the City of Santa Cruz have been considered and utilized, in part, to develop the following quantified significance criteria (presented in Table 4.10-7) for Significance Thresholds A and B above related to permanent increases in ambient noise levels.

Table 4.10-7. Significant Change in Permanent Ambient Noise Levels

Existing Ambient Noise Level, L_{dn}/CNEL	Significant Increase
<60 dBA	+ 5 dB or Greater
>60 dBA	+ 3 dB or Greater

Source: Adapted from FICON 1992 and Caltrans 2020.
Notes: dBA = Decibel A-weighted; CNEL = Community Noise Equivalent Level; L_{dn} = day-night average noise level.

It is important to consider significance thresholds based on the degradation of the existing ambient noise environment. Using a single absolute value to evaluate an impact relating to a noise level increase would not account for the preexisting ambient noise environment to which a person has become accustomed. The County of Santa Cruz and the City of Santa Cruz have established varying standards to address increases in the ambient noise environment that occur due to the development of a project, or the addition of a new noise source. These relative noise level thresholds allow for an increase above the existing ambient noise levels ranging from 3 to 6 dBA L_{dn}, depending on the ambient noise level without the project element or the land uses involved.

For community noise assessments Caltrans considers that it is "generally not significant" if no noise-sensitive uses are located within the project area, or if increases in community noise levels associated with implementation of the project would not exceed +3 dB at noise-sensitive locations in the project vicinity (Caltrans 2020a). Research assessing the percentage of people who are highly annoyed by changes in ambient noise levels indicate that when ambient noise levels are low, a greater change is needed to cause a response. As ambient noise levels increase, a lesser change in noise levels is required to elicit significant annoyance. Based on this premise, the significance thresholds outlined in Table 4.10- for permanent increases in ambient noise levels are considered to correlate well with human response to changes in such noise levels and assess degradation of ambient community noise environment. These significance thresholds are consistent with those outlined by the County of Santa Cruz and would provide compliance with the City of Santa Cruz relative increase standards.

Given the above, the quantified significance thresholds for Significance Thresholds A, B, and C are as follows:

- **Significance Threshold A**. The Proposed Project would result in the generation of a substantial permanent increase in ambient noise levels resulting in a significant impact in the vicinity of the Project if they would cause an increase of +5 dBA L_{dn} in the ambient noise level exposure, where existing ambient noise levels are below 60 dBA L_{dn} or a +3 dBA L_{dn} increase in the ambient noise level exposure, where existing ambient noise levels are above 60 dBA L_{dn}, based on Table 4.10-7. (These thresholds are consistent with those outlined by the County of Santa Cruz and would provide compliance with the City of Santa Cruz relative increase standards.)
- **Significance Threshold B**. The Proposed Project would result in the generation of a substantial temporary or permanent noise levels in the vicinity of the Project if the following standards would be exceeded:
    - Construction Noise. For temporary construction activities, a significant impact would occur if construction noise exceeds 60 dBA between 10:00 PM and 8:00 AM or 75 dBA between 5:00 PM and 10:00 PM. Between the hours of 8:00 AM to 5:00 PM on weekdays, construction noise is not limited, based on Santa Cruz County Code Section 8.30.10. Other factors considered in the determination of significance are pitch, duration of sound, time of day or night, necessity of the noise, and proximity to buildings used for sleeping.
    - Operational Noise. For operational noise in any location the same quantified significance thresholds as identified for Significance Threshold A would apply.
- **Significance Threshold C.** The Proposed Project would result in the generation of substantial temporary ground borne noise or vibration levels if it would result in groundborne noise or vibration levels that exceed the Caltrans guidance (i.e., 0.3 in/sec PPV for older residential structures and 0.25 in/sec PPV for historic buildings and some old buildings exposed to continuous/frequent intermittent sources) (Caltrans 2020).

4.10.4.2 Analytical Methods

Potential noise impacts associated with the Proposed Project were calculated and analyzed based on project construction and operations information; information contained in the traffic analysis and construction assumptions developed for the analyses in this EIR and data obtained during on-site noise measurements. Observations made during the site survey along with land use information and aerial photography were used to determine potential locations of sensitive receptors near the Proposed Project.

Construction

The principal source of project-generated noise would be associated with construction activities; therefore, the analysis focuses on construction noise and vibration. Construction-related noise effects were assessed with respect to nearby noise-sensitive receptors and their relative exposure (accounting for intervening topography, barriers, distance, etc.), based on application of FHWA Roadway Construction Noise Model and FTA reference noise level data and usage-factors (percentage of the time that the equipment is operational). The FTA and FHWA have measured and documented maximum noise levels and operational characteristics for a wide range of construction machinery, which are summarized in Table 4.10-8.

Table 4.10-8. Typical Construction Equipment Noise Emission Levels

Equipment Description	Acoustical Use Factor (%)	L_{max} at 50 feet (dBA, slow)[1]
Auger Drill Rig	20	85
Backhoe	40	80
Compactor (ground)	20	93
Compressor (air)	40	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Concrete Saw	20	90
Crane	16	85
Dozer	40	85
Dump Truck	40	80
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Generator	50	82
Grader	40	85
Jackhammer[2]	20	85
Mounted Impact Hammer (hoe ram)[2]	20	90
Paver	50	85
Pneumatic Tools	50	85
Pumps	50	77
Rock Drill	20	85
Roller	20	85
Scraper	40	85
Tractor	40	84
Vacuum Excavator (Vac-truck)	40	85

Sources: DOT 2006; FTA 2018.
Notes: L_{max} = maximum noise level; dBA = A-weighted decibels.
1 All equipment fitted with a properly maintained and operational noise control device, per manufacturer specifications.
2 Impulsive/impact device.

The effects of construction noise depend largely on the types and specific locations of construction activities occurring on any given day, noise levels generated by those activities, distances to noise-sensitive receptors,[1] and the existing ambient noise environment in the vicinity of the receiver. Construction generally occurs in

[1] Distances of construction activities to noise-sensitive receptors can vary throughout a given day and over the course of construction as construction equipment and activities move along the linear pipeline construction site.

several discrete stages, with each stage varying the equipment mix, and the associated noise. These stages alter the characteristics of the sound levels generated from the construction activity and in the surrounding community.

Additional noise sources associated with the Proposed Project would be off-site construction traffic on the local and regional roadway network. Project-related traffic was evaluated qualitatively based on the passenger car equivalent (PCE) vehicle trips and existing traffic volumes used as an input.

The decommissioning of the existing pipeline segment along Pipeline Road would include the use of minimal heavy construction equipment and would complete approximately 1,000 linear feet per day. Nearest receptors are located generally west of the alignment and the San Lorenzo River, at the northern portion of Henry Cowell State Park (i.e., Beth Drive, River Lane, and Old Big Trees Drive). Based on the small area of nearby sensitive receptors, the distance between the alignment and the receptors, the limited use of heavy equipment and the rate of the decommissioning operations, the Proposed Project would not exceed the daytime thresholds of significance during such operations.

Groundborne vibration impacts were qualitatively assessed based on existing reference documentation (e.g., vibration levels produced by specific construction equipment operations), through the application of Caltrans methodology outlined in the Transportation and Construction Vibration Guidance Manual (Caltrans 2020) and the relative distance to sensitive receptors from a given vibration source. Representative groundborne vibration levels for various types of construction equipment, developed by FTA, are summarized below in Table 4.10-9. Based on the reference vibration levels presented in Table 4.10-9, the distance at which the equipment would exceed the applicable Caltrans thresholds was calculated for the Proposed Project.

Table 4.10-9. Representative Vibration Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)[1,2]	Approximate Lv (VdB) at 25 feet[3]
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Heavy-duty Trucks (Loaded)	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: FTA 2018.
Notes:
1 Where PPV is the peak particle velocity.
2 Vibration levels can be approximated at other locations and distances using the above reference levels and the following equation: $PPV_{equip} = PPV_{ref} (25/D)^{1.5}$ (in/sec); where "PPV ref" is the given value in the above table, "D" is the distance for the equipment to the new receiver in feet.
3 Where Lv is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.

Operation

The Proposed Project's operation and maintenance activities for existing infrastructure (i.e., pipelines, valves, blowoffs, and FBPS) would generally remain similar to existing activities. The Proposed Project does not include pump stations or other appurtenant facilities that would generate noise. Once Proposed Project construction is complete, operations would be similar to existing conditions and would not require an increase in on-road vehicle trips associated with routine inspection and maintenance by City staff. The Proposed Project

components are discussed qualitatively based on existing and similar facilities, existing ambient noise levels and nearby noise-sensitive receptors.

Application of Relevant Standard Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that the City or its contractors would implement to avoid or minimize effects related to noise and vibration. One Standard Construction Practice would be applicable to the noise and vibration impacts of the Project; its effectiveness in avoiding and minimizing effects is described below.

Standard Construction Practice #26 requires the City to designate a Construction Noise Coordinator and notify adjacent property owners regarding planned nighttime construction activities and specifies the protocol for responding to any local complaints that are received about construction noise. When a noise complaint is received, the Construction Noise Coordinator shall notify the City within 48 hours, determine the cause of the complaint, and implement as possible reasonable measures to resolve the complaint as deemed acceptable by the City. This measure provides an avenue for adjacent property owners to communicate with the City to express noise complaints but does not include enforceable, objective measures or standards that the Proposed Project must achieve related to construction noise.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, if applicable, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.10.4.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance as described below.

- **Exposure to Aircraft Noise (Significance Threshold D).** The Proposed Project would not expose people to excessive aircraft noise. The nearest airstrip to the Proposed Project is the Bonny Doon Village Airpark, which is a privately owned, private-use airport located approximately 2.5 miles west of the Brackney North and Brackney South sections. The nearest public or public-use airport is Watsonville Municipal Airport, which is located approximately 14 miles southeast of the GHWTP facility. Watsonville Municipal Airport is not part of an adopted airport land use plan, and the study area is not located within the airport influence area (County of Santa Cruz 2020c). Therefore, the Proposed Project would have no impact related to exposure of people in the project area to excessive airport-related noise, and this threshold is not further evaluated.

Project Impacts

Impact NOI-1: Substantial Permanent Increase in Ambient Noise Levels (Significance Threshold A). Operation of the Proposed Project would not result in generation of a substantial permanent increase in ambient noise levels during long-term operation in the vicinity the Project components. ***(Less than Significant)***

The Proposed Project would not include any new noise generating sources that would result in long-term operational noise levels. The FBPS has been improved over the past decade, and no new pump stations would be required for the Proposed Project. Minor operational and maintenance components would include the replacement of existing air valves, new air/vacuum valves in some new pipeline sections and blowoff valves. Air/vacuum valves would typically be installed along the pipeline at 1/4 to 1/2- mile intervals to aid in the releasing of air when filling the pipeline, dewatering the pipeline, isolating pipeline sections or other maintenance activities. Noise generated in association with the use of these valves would be minimal, consistent with existing operations, and are not operated for a significant duration of time to affect the ambient day/night noise levels (L_{dn}).

Long-term operation of the Proposed Project would result in a negligible increase in traffic on the roadway network, as it is expected to remain consistent with current operation and maintenance activities. Routine maintenance is expected but would be similar to existing conditions. Therefore, long-term operation and maintenance of the Proposed Project would result in a less-than-significant impact.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to permanent increases in noise, and therefore, no mitigation measures are required.

Impact NOI-2: Substantial Increase in Ambient Noise Levels in Excess of Standards (Significance Threshold B). Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established in local general plans or noise ordinances. ***(Significant and Unavoidable)*** Operation of the Proposed Project would not result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Proposed Project in excess of applicable standards. (***Less than Significant***)

Construction

The majority of the Proposed Project includes conventional open cut trenching and construction methods. Trenchless methods would be used in the Brackney North and potentially Brackney South sections and for the existing railroad crossing in the Graham Hill Road North section. The Proposed Project construction methods would have the potential to impact the ambient noise environment in the immediate vicinity of construction activities. The Proposed Project is scheduled to be constructed in phases over multiple years from late 2022/early 2023 to 2032. The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first, with an estimated construction schedule of about 24 months for the

Graham Hill Road sections and approximately 9 months for the Brackney North section, including pipeline installation, road repaving, and abandonment of the existing NCP.

Construction generally would occur during normal weekday work hours, between 8 AM and 5 PM and in accordance with County of Santa Cruz encroachment permit requirements. However, construction along Graham Hill Road would be limited to the hours of 8 AM to 4 PM with temporary lane closures restricted to 9 AM to 3 PM. The trenchless installation method that will be used for the pipeline in the Brackney North section would primarily occur during weekday work hours, between 8 AM and 5 PM; however, the HDD construction method would require approximately one day of continuous 24-hour construction activity.

The Proposed Project also includes the implementation of Standard Construction Practice #26 that requires that adjacent property owners be notified of nighttime construction schedules and that a Construction Noise Coordinator be identified that will be responsible for responding to local complaints about construction noise. See Section 4.10.4.2, Analytical Methods, for additional information about this measure and its effectiveness.

Conventional Trenching and Construction Methods

Conventional open cut trenching methods consist of excavation of the trench, removal of soil, installation of pipe bedding, and backfilling with engineered fill. Conventional construction methods would be utilized throughout the Proposed Project alignment in all pipe sections, except for the Brackney North section, potentially the Brackney South section, and a portion of the Graham Hill Road North section at a railroad crossing. The open cut trench would typically be 4 to 5 feet wide, with construction support activities occurring within a 10- to 15-foot-wide construction corridor. Approximately 60 to 100 linear feet of pipeline can be installed on a typical workday using conventional trenching.

The conventional trenching and construction methods would generate noise levels associated with the operation of heavy construction equipment and construction related activities (see Table 4.10- for typical construction equipment noise levels).

Noise levels for the phases using conventional trenching and construction methods were calculated using the FHWA and FTA reference noise levels presented in Table 4.10-. The loudest mix of equipment associated with conventional trenching and pipeline construction would occur during the "Pipeline – Road Removal/Pipe Installation/Appurtenances" phase. The Pipeline phase would incorporate the use of excavators, backhoes, loaders, dump trucks, and rollers; with a resulting noise level of 85.2 dBA L_{eq} at a distance of 50 feet. Accounting for an attenuation rate of 6 dB per doubling of distance, construction of the Proposed Project would exceed the daytime noise level threshold of 75 dBA at a distance of 124 feet and the 60 dBA nighttime threshold at a distance of 472 feet, although no nighttime construction is proposed for segments with conventional construction methods. While some residents would be subject to intermittent noise levels that may exceed 75 dBA during the day, given the linear nature of conventional open cut trenching and construction methods, the Proposed Project would not expose an individual noise-sensitive receptor to construction noise for extended periods of time. However, noise-sensitive receptors located less than 124 feet from the conventional trenching and construction methods could be exposed to noise levels exceeding the daytime construction noise thresholds. As such, the construction of the Proposed Project would result in a potentially significant impact.

Implementation of MM NOI-1 would reduce the temporary increase in ambient noise levels during construction in excess of applicable standards in the vicinity of the Proposed Project by requiring the location of noise generating equipment as far as possible from noise-sensitive receptors, within an acoustically rated enclosure, shroud or temporary barrier when necessary; requiring the use of mufflers and noise suppressors on equipment; and limiting equipment idling. For the conventional trenching construction methods, these measures would result in the minimization of construction noise that would typically be considered unreasonably disturbing, such as noise having excessive intensity, duration, or pitch as defined in the County Code and reduce construction noise levels below the daytime noise level threshold of 75 dBA.

Trenchless Construction Methods

Brackney North and Brackney South Sections. Construction of the Proposed Project pipeline segment in the Brackney North section would be installed using the trenchless Horizontal Directional Drilling (HDD) method. Construction activities associated with the HDD drilling operations would be located in a typical work area of 15,000 sf. at the northern HDD entry point. The HDD drilling would be conducted from a work area located near the gravel turnout near the intersection of Brackney Road and the City's existing pipeline easement, which would locate the acoustical center of the work area approximately 150 feet from the nearest noise-sensitive receptor's outdoor activity area. The northern HDD entry point would be located within a temporary construction easement between Caledonium Avenue and Fremont Avenue, which would locate the acoustical center of the work area approximately 75 feet from the nearest noise-sensitive receptor's outdoor activity area. As indicated in Chapter 3, Project Construction, HDD operations would generally occur between 8 AM and 5 PM; however, the pipeline pullback portion of the HDD process would require continuous 24-hour operation for approximately one (1) day.

The HDD construction process generally consists of three stages; drilling of a pilot hole, enlarging the pilot hole using a larger cutting tool known as a back reamer, and pulling of the pipe through the enlarged hole. Equipment used for the HDD process on the primary entry site generally includes a drill rig, mud (lubrication fluid) pumping and processing systems, heavy equipment (e.g. crane, boom truck, loader, backhoe, etc.), and frac tanks (water and mud storage). The HDD exit side can employ an additional HDD entry side rig/equipment or use a smaller compliment of heavy equipment and support equipment (Burge and Kiteck 2009). For the Proposed Project it is assumed that a full complement of equipment may be employed at both HDD entry sites. Empirical sound level data, based on HDD drilling operations of varying sizes, indicates that the sound power levels (Lw) generated by a typical equipment complement for an HDD entry side would be 115 dBA Lw. At a distance of 75 feet, sound pressure levels generated by the HDD entry side equipment under "peak" power are calculated to be approximately 75 dBA L_{eq} at the nearest noise-sensitive receptor's outdoor activity area. As previously discussed, throughout the construction operations the equipment would have periods of peak operation and periods of time with lower noise level emissions; this is accounted for through application of the acoustical usage factors presented in Table 4.10-8. Application of any acoustical usage factor less than 100% peak operation would reduce the HDD entry site noise level exposure at the nearest receptor to levels less than the predicted peak of 75 dBA Leq. Therefore, HDD drilling operations would comply with the County of Santa Cruz 75 dBA Leq construction threshold during the daytime period of 8 AM to 5 PM, but would exceed the 60 dBA Leq noise level threshold when operating outside of the daytime hours. As such, the construction of the Proposed Project would result in a potentially significant impact.

During the construction period requiring continuous HDD pipeline pullback operations at the Brackney North section, the implementation of MM NOI-1, limiting operations to less sensitive daytime hours, would not be

possible. Implementation of MM NOI-1 would reduce the HDD construction noise levels between 5 and 13 dBA (Wu & Keller 2007), resulting in noise levels calculated to range from 62 to 70 dBA at nearby noise-sensitive receptors. Therefore, temporary noise from these operations could still exceed the noise level thresholds noted above, after incorporation of MM NOI-1. As a result, construction of the Brackney North pipe section would have a significant and unavoidable impact related to construction noise.

Similar noise impacts could result during construction of the Brackney South section if the HDD method is used for in all or part of this area. Depending on the location of the pipe entry sites, the nearest noise sensitive receptor may be within 75 to 100+ feet of the entry. Temporary construction operations could also exceed noise level thresholds as noted above. As a result, construction of the Brackney South pipe section could have a significant and unavoidable impact related to construction noise.

Graham Hill Road North Section. A trenchless construction also would be used to extend the proposed pipe under the existing Big Trees and Union Pacific Railway crossing across Graham Hill Road in the Graham Hill North pipe section. Two alternatives are under consideration. The first, pipe ramming, is a trenchless, non-steerable installation method for driving an open-ended steel casing using a percussive hammer. The hammer transmits the ramming force to the pipe via a tapered adaptor cone which is welded to the rear of the pipe. After a section of casing has been installed, the hammer and adaptor cones are removed, and a new casing section is welded into place. The hammer assembly is reattached, and ramming operations continue. The soil may be removed from the casing using augers, jetting, or compressed air after completion of ramming, or at intervals during the drive (Mott MacDonald 2021).

The loudest noise generator associated with pipe ramming is caused by the anvil (within the hammer) striking the casing and transferring the hammer energy into the pipe. During the pipe ramming process there are hammer strike periods and longer periods of lower noise levels generated by secondary support equipment (e.g., excavators, spoil clearing, cranes or lift-trucks, air compressors/hydraulic power units). Depending on the type of power unit (i.e., pneumatic or hydraulic), the pneumatic air compressor has been found to be the loudest consistent noise source of the necessary support equipment (Atalah 1998). Based on typical operations of the secondary support equipment, an air compressor or hydraulic power unit, excavator, crane or lift-truck could be used at the same time to complete the designated task. These operations would result in combined loudest noise levels of 82.2 dBA Leq at a distance of 50 feet. As a result, noise-sensitive receptors within approximately 115 feet of the center of construction activity would be exposed to noise levels exceeding the County of Santa Cruz construction noise threshold of 75 dBA and be potentially significant. After the incorporation of MM NOI-1 construction of the Graham Hill Road North section, utilizing the pipe ramming construction methods would be reduced to a less than significant impact.

The second alternative construction method, auger-boring, is a pipe jacking method for installing a casing pipe between two shafts by means of a rotating cutting head. This process requires an auger boring machine to be placed in a launch pit on grade at the beginning of the pipeline segment as well as a reception pit at the end of the drive. The auger boring machine is equipped with a jacking frame, forces from the jacking frame need to be transferred to the back of the jacking shaft with a thrust block or into the soil below with anchors. The auger-boring head can produce elevated noise levels in the immediate vicinity of the drilling face; however, the drilling face would be located in an entrance or exit pit, which would provide shielding of the noise generated by the auger-boring drill face. Secondary support equipment, located at ground level, would include a similar complement of equipment as used in the HDD and pipe ramming trenchless methods, such as an air compressor, excavator, hydraulic power unit, a welder and either a lift truck or crane for placing/positioning of

pipe sections. With that, noise-sensitive receptors within approximately 115 feet of the center of construction activity would be exposed to noise levels exceeding the County of Santa Cruz construction noise threshold of 75 dBA and be potentially significant. After the incorporation of MM NOI-1 construction of the Graham Hill Road North section, utilizing the pipe ramming construction methods would be reduced to a less than significant impact.

Operation

As indicated in Impact NOI-1, the Proposed Project would not directly result in operational activities or include new substantial noise sources. Given that, the Proposed Project would not result in a substantial permanent increase in ambient noise levels and long-term operation of the Proposed Project would have no operational noise impact.

Mitigation Measures

Implementation of MM NOI1 described below would reduce potentially significant construction noise to a less-than-significant level for construction of pipeline sections using conventional trenching methods. However, as indicated above, the Brackney North pipeline installation would have significant and unavoidable construction noise impacts due to 24-hour pipeline pullback operations during construction.

MM NOI-1: **Construction Noise (Applies to all segments).** The Proposed Project shall implement the following measures related to construction noise:

- Restrict construction activities and use of equipment that have the potential to generate significant noise levels (e.g., use of concrete saw, mounted impact hammer, jackhammer, rock drill, etc.) to between the hours of 8:00 AM and 5:00 PM, unless specifically identified work outside these hours is authorized by the City's Water Director as necessary to allow for safe access to a construction site, safe construction operations or efficient construction progress, such as required by the HDD pullback operations for the Brackney North segment.
- Construction activities requiring operations continuing outside of the standard work hours of 8:00 AM and 5:00 PM (e.g., HDD operations for the Brackney North and Brackney South sections) shall locate noise generating equipment as far as possible from noise-sensitive receptors, and/or within an acoustically rated enclosure (meeting or exceeding Sound Transmission Class [STC] 27), shroud or temporary barrier as needed to limit the propagation of sound into the surrounding areas in excess of the 60 dBA nighttime (10:00 PM to 8:00 AM) criteria at the nearest sensitive receptor. Noisy construction equipment, such as aboveground conveyor systems, and impact tools will likely require location within such an acoustically rated enclosure, shroud or barrier to meet the above criteria. Impact tools, in particular, shall have the working area/impact area shrouded or shielded whenever possible, with intake and exhaust ports on power equipment muffled or suppressed.
- Use of temporary or portable, application-specific noise shrouds, barriers or enclosures shall be required to shield nearby noise-sensitive receptors from equipment and operations that have the potential to generate noise levels in excess of the 75 dBA daytime (8:00 a.m. to 10:00 p.m.) criteria, as measured at nearby

sensitive receptors. This generally corresponds with a distance of 125 feet from construction activities to the nearest sensitive receptor, however site-specific factors will need to be taken into consideration, such as the specific construction equipment mix, and intervening structures or topography that may result in associated noise reductions below the acceptable daytime noise threshold.

- Portable and stationary site support equipment (e.g., generators, compressors, and cement mixers) shall be located as far as possible from nearby noise-sensitive receptors.
- Construction equipment and vehicles shall be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Internal-combustion-powered equipment shall be equipped with properly operating noise suppression devices (e.g., mufflers, silencers, wraps) that meet or exceed the manufacturer's specifications. Mufflers and noise suppressors shall be properly maintained and tuned to ensure proper fit, function, and minimization of noise.
- Construction equipment shall not be idled for extended periods of time (i.e., 5 minutes or longer) in the immediate vicinity of noise-sensitive receptors.

Impact NOI-3: Groundborne Vibration (Significance Threshold C). Construction of the Proposed Project would result in the potential generation of excessive groundborne vibration or groundborne noise levels. ***(Less than Significant)***

Construction activities may result in varying degrees of temporary groundborne vibration or noise, depending on the specific construction equipment used and operations involved. Pile driving and blasting are not currently expected to be utilized in the construction of the Proposed Project. The construction phases and equipment mixes used in this analysis are consistent with those used in Impact NOI-2. The Proposed Project is not anticipated to incorporate equipment or processes that would generate substantial groundborne noise or vibration during operations; as such, groundborne noise and vibration sources would be limited to construction activities.

Groundborne noise and vibration sources are anticipated to include typical heavy equipment (e.g., excavator, tractors, vibratory roller, etc.) associated with conventional open cut trenching and pipeline construction, as well as equipment associated with the HDD pipeline installation process (e.g., drill rig, hydraulic power units, mud pump and process equipment, and tanks). Use of a vibratory roller during the paving portions of pipeline installations would produce vibration levels exceeding the Caltrans threshold of 0.3 in/sec PPV at distances of 15 feet or less from the vibratory roller. Vibration generating activities associated with the conventional open cut trenching and construction methods would be performed within the roadway right-of-way and easements. When accounting for typical property line setback distances for structures, structures susceptible to vibration damage would be located at distances greater than 15 feet and would not exceed the Caltrans 0.3 in/sec PPV threshold. Therefore, generation of groundborne noise and vibration levels associated with conventional open cut trenching and construction methods would result in a less-than-significant impact.

The closest sensitive receptors to the HDD entry points for the Brackney North segment are more than 50 feet from the proposed construction activities. The drill rig and heavy equipment associated with the HDD pipeline installation and construction process would produce vibration levels less than 0.03 in/sec PPV; which would be substantially below the Caltrans threshold of 0.3 in/sec PPV. The closest sensitive receptors for the Graham

Hill Road North trenchless construction activities are approximately 40 feet from the proposed activities. Vibration levels present during trenchless methods such as pipe ramming will be dependent on the power applied through the hammer. Empirical data indicates that trenchless methods such as pipe ramming would attenuate to the Caltrans threshold of 0.3 in/sec PPV at an approximate distance of 30 feet (Atalah 1998) and would be approximately 0.18 in/sec PPV at a distance of 40 feet. Therefore, generation of groundborne noise and vibration levels associated with trenchless HDD construction methods would result in a less-than-significant impact.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to vibration, and therefore, no mitigation measures are required.

4.10.4.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative noise impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic. The geographic area of potential cumulative noise and vibration impacts is limited to the immediate vicinity of the project pipeline alignment, areas immediately adjacent to the routes designated for access, hauling or linear construction and areas within approximately 650 feet of the Proposed Project construction activities.

The Proposed Project would not contribute to cumulative impacts related to **aircraft noise (Significance Threshold D)** because it would have no impact related to this threshold as described above. Therefore, this significance threshold is not further evaluated.

Impact NOI-4:	**Cumulative Noise Impacts (Significance Thresholds A, B and C).** Construction and operation of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to noise and vibration. ***(Less than Significant)***

Cumulative noise impacts could occur if sensitive receptors were exposed to elevated noise and vibration levels from multiple cumulative projects simultaneously and in close proximity. Construction of the project would occur over several phases, beginning in 2022 and ending in 2031. As shown in Table 4.0-1, which displays the estimated construction schedule for cumulative projects, where known, there are two cumulative projects that are located at or near the Project sites that could be under construction during this same period of time as the Proposed Project. The only cumulative projects with an overlap of construction schedules are two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project). Other cumulative projects in the vicinity of Project sites would be completed before Proposed Project construction begins (Newell Creek Dam Inlet/Outlet Improvement Project and San Lorenzo Way Bridge Replacement) or would occur after completion of the Graham Hill Road pipe sections (intertie pipeline with Scotts Valley, for which no project timeline has been established).

Construction of the Proposed Project would have the potential to generate noise and vibration levels in excess of the applicable standards, as described in Impact NOI-2. Specifically, construction of the Brackney North

pipe section would require continuous 24-hour operation for pipeline pullback, which would be a significant contribution to the immediate noise environment when the pullback operations are underway. As indicated in Impact NOI-2, this impact would be significant and unavoidable specifically related to the HDD activities due to the continuous nature of the noise and its operation in the more sensitive nighttime period. However, the HDD pipeline installation operations would not occur in close enough proximity to allow for construction noise levels to combine with cumulative projects and therefore would not result in a significant cumulative noise impact. The HDD pipeline pullback operations would also cease after approximately one day. Conventional open cut trenching and construction operations associated with the Proposed Project would not generate noise levels that would contribute to a significant cumulative noise impact. Therefore, the Proposed Project's cumulative construction noise impact would be less than significant, despite the significant and unavoidable project-specific noise impacts of the trenchless HDD pipeline construction methods.

Based on the distance of all of the Proposed Project construction operations from other cumulative noise-generating projects, cumulative projects would not result in a significant cumulative impact related to noise and vibration.

4.10.5 References

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4.11 Transportation

This section describes the existing transportation conditions in the vicinity of the Project sites, identifies associated regulatory requirements, evaluates potential Project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to implementation of the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). The section is based on review of existing County of Santa Cruz and Santa Cruz County Regional Transportation Commission (SCCRTC) plans, studies and transportation-related documents, as well as a construction traffic analysis prepared for the City of Santa Cruz Water Department (City) (HDR 2021).

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to transportation.

4.11.1 Existing Conditions

4.11.1.1 Project Access and Roadway Network

Access to Proposed Project Sites

The existing NCP and Proposed Project are located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City of Santa Cruz, but is surrounded by unincorporated lands. Regional access to the Proposed Project region is provided from State Route 1 (locally referred to as Highway 1) and State Route 17 (locally referred to as Highway 17), both to the south of the Proposed Project, and State Route 9 (locally referred to as Highway 9) to the west of the Proposed Project.

Local roads, primarily within the unincorporated area of Santa Cruz County, provide access to the Proposed Project sites. Access to the Proposed Project northern segment is provided by Graham Hill Road, Mount Hermon Road, and Highway 9, as well as several County roads, including Glen Arbor Road, Newell Creek Road, Brackney Road, San Lorenzo Way, and Rose Acres Lane. Access to the Proposed Project southern segment is primarily provided from Graham Hill Road, Mount Hermon Road, and Highway 9, as well as Lockewood Lane and Sims Road. Pipeline Road, a partially paved trail through Henry Cowell Redwoods State Park, provides access to the existing NCP pipe section in this location. In addition to the public roadways providing access to the Proposed Project segments, City easements on private land serve portions of the existing alignments and would continue to serve the Proposed Project segments with some minor modifications and additions.

Roadway Network

State Highways

State Highway 9 is a generally north-south, two-lane, 27-mile, undivided highway that connects the City of Santa Cruz with unincorporated Santa Cruz County areas including the communities of Felton, Ben Lomond, and Boulder Creek in the San Lorenzo Valley (SLV). Highway 9 ends in the City of Saratoga in Santa Clara County where it connects with Highway 17. Highway 9 also connects with Highway 1 within the City of Santa Cruz. There

are no parking or bicycle facilities provided along Highway 9. The posted speed limit ranges between 25 and 45 miles per hour (mph). Highway 9 is a heavily used commuter and recreational travel route within the SLV.

State Highway 17 is a north-south, four-lane divided freeway that connects the City of Santa Cruz with unincorporated Santa Cruz County areas, as well as to Santa Clara County and the San Jose metropolitan area. Highway 17 ends in the City of San Jose where it connects with Interstate 880 (I-880). Highway 17 also connects with Highway 1 within the City of Santa Cruz. Highway 17 provides regional access to the SLV via Mount Hermon Road in the City of Scotts Valley and Ocean Street in the City of Santa Cruz to Graham Hill Road. There are no parking or bicycle facilities provided on Highway 17 and the posted speed limit ranges between 50 mph to 65 mph.

Highway 17 is a winding, mountainous road, and segments along this route are narrow, do not have shoulders, or have a narrow median with guard rail. Although this road does not have signalized intersections, there are several unsignalized intersections with acceleration/deceleration lanes as well as t-intersections with local roads. The route is heavily used for commuter travel on weekdays and for recreational travel on weekends, and is, therefore, subject to delay (AMBAG 2018a). In addition to its challenging roadway configuration, weather-related conditions such as thick fog, heavy rains, and mudslides affect roadway operations on Highway 17.

State Highway 1 provides access to San Francisco to the north and Monterey to the south. Regionally, Highway 1 is the major inter- and intra-county route for Santa Cruz County. Within the City of Santa Cruz, it is oriented in an east-west direction, although the interregional alignment of Highway 1 is primarily north-south. It is a four-lane arterial street along Mission Street from the west side of Santa Cruz to Chestnut Street Extension, a four-lane expressway between Mission Street-Chestnut Street and River Street, and a four-lane freeway east of River Street. The speed limit on Highway 1 is 25 mph along Mission Street, 45 mph along the expressway section, and 55 and 65 mph on the freeway sections. Recurrent congestion results in queuing on Highway 1 that extends for several miles during peak hours.

Local Streets and Roads

Three functional street classifications are identified in the County of Santa Cruz General Plan (1994):

- Arterial: a signalized street that serves through-traffic and provides access to major destinations.
- Collector: a street that collects traffic from local residential streets and distributes it to arterials.
- Local: a street that provides access to adjacent properties.

Newell Creek Road is a two-lane north-south local road extending approximately 1.5 miles from Glen Arbor Road in Ben Lomond to its terminus at the Newell Creek Dam. Newell Creek Road is a private road and access is restricted by a gate for approximately 0.8 miles south of the dam upon which it becomes a public County road to its intersection with Glen Arbor Road. The posted speed limit is 25 mph.

Glen Arbor Road is a two-lane north-south collector road with one travel lane in each direction conveying vehicular traffic from the SLV to the Zayante area. The road extends east from Highway 9, which is a signalized intersection. The road is an emergency evacuation route and bypass for a segment of Highway 9, extending approximately 1.75 miles through the community of Ben Lomond. The posted speed limit is 30 mph.

Graham Hill Road is a two-lane north-south arterial road that has 11-foot lane widths with less than 2-foot to 3-foot wide shoulders and no parking. The road extends approximately 6 miles from the Santa Cruz city limits to Highway 9 in Felton. Graham Hill Road provides access to Henry Cowell Redwoods State Park and serves as an alternative route to Highway 9 between the City of Santa Cruz and the unincorporated SLV. Graham Hill Road has a posted speed limit of 35 mph, except the speed limit is 45 mph for a segment between Treetop Drive and the Santa Cruz County Juvenile Center.

Mount Hermon Road is a four-lane, east-west major arterial, with two travel lanes in each direction separated by an intermittent raised median. Mount Hermon Road extends from Highway 17 in the City of Scotts Valley on the east to Graham Hill Road in the unincorporated Santa Cruz County on the west. It serves as the primary commercial street through the City of Scotts Valley and provides regional access between Highway 17 and Highway 9 in Felton. The posted speed limit ranges between 35 mph and 45 mph.

East Zayante Road is a two-lane, north-south road that extends north from Graham Hill Road.

Quail Hollow Road is a two-lane, east-west local road that extends between East Zayante Road on the southeast and Glen Arbor Road on the northwest.

Lockewood Lane is a two-lane two-way residential roadway that connects Graham Hill Road to Mount Hermon Road.

Sims Road is a two-lane two-way residential roadway that connects Graham Hill Road to La Madrona Drive.

La Madrona Drive is a two-lane two-way roadway that acts as a frontage road to Highway 17 where drivers can access northbound or southbound.

Other Local Roads. Other local residential roads in the vicinity of the Project sites include: Brackney Road, Caledonium Avenue, Fremont Avenue, Schaff Road, Rose Acres, and San Lorenzo Way in the Project northern segment and numerous local roads off of Graham Hill Road in the Project southern segment, including Lockewood Lane and Sims Road.

4.11.1.2 Other Transportation Modes

Pedestrian Facilities

No sidewalks or pedestrian paths are located in the vicinity of the Proposed Project sites. While there are some pedestrian facilities (sidewalks, paths, and crosswalks) in town centers in Felton and Ben Lomond, the rural nature of the area has left most pedestrians outside of the town centers walking along the shoulders of Highway 9 and on local roads (SCCRTC et al. 2019). Improvements are proposed for Highway 9 that would provide a new sidewalk from the SLV High School toward the Highway 9/Graham Hill Road intersection on the southbound side of Highway 9. As part of this improvement, shoulder widening would be constructed so that a minimum 4-foot wide shoulder is provided on the southbound side of the highway at all locations where the sidewalk is constructed at the highway grade (California Department of Transportation [Caltrans] 2021). The Project is expected to the completed in 2027.

Bicycle Facilities

No bicycle lanes are located in the vicinity of the Proposed Project sites. While there are no dedicated bicycle lanes or paths along Highway 9 or local roads in the SLV, the highway is regularly used by bicyclists commuting through and between town centers, cyclists accessing parks, as well as recreational cyclists, sometimes traveling the entire length of Highway 9 from Santa Clara County/Saratoga to Santa Cruz. Where shoulders exist, cyclists often use that space, but otherwise are sharing the road surface with motorists (SCCRTC et al. 2019).

Public Transit Service

The Santa Cruz Metropolitan Transit District (SCMTD), also known as Santa Cruz METRO, provides public transit services throughout Santa Cruz County. The three main types of services provided by SCMTD are local fixed-route bus service, Highway 17 Express Bus service, and specialized ParaCruz services for people with disabilities. The nearest SCMTD transit center to the Project site is the Cavallaro Transit Center in the City Scotts Valley, located approximately 2-4.5 miles southwest of the Proposed Project sites. SCMTD Route 35 serves the SLV, connecting the City of Santa Cruz to Boulder Creek via Scotts Valley. Route 35 offers 30-minute service and operates several bus stops along Glen Arbor Road in the Proposed Project northern segment (SCMTD 2021).

Rail Operations

There is currently no passenger rail service in Santa Cruz County. However, the Santa Cruz Big Trees and Pacific Railway Company operates a tourist-oriented passenger service between Felton and the Santa Cruz Beach Boardwalk on its nine-mile track line from Santa Cruz to its current terminus at Roaring Camp. The service was provided daily during mid-June through the end of August, and weekends and holidays in May, early June, September through October, late November, and December. In the past year, the train services was provided on weekends. The trains run twice in each direction every day during regular operations. A rail crossing on Graham Hill Road exists south of the road's intersection with East Zayante Road.

4.11.1.3 Existing Traffic Conditions

Vehicle Traffic

Vehicle traffic conditions are measured by average daily traffic (ADT), peak-hour traffic volumes, level of service (LOS), average delay, and/or volume-to-capacity (V/C) ratio. Average daily traffic is the total number of cars passing over a segment of the roadway, in both directions on an average day. Peak-hour volumes are the total number of cars passing over a roadway segment during the peak hour in the morning (AM) or afternoon/evening (PM).

To evaluate the performance of roadways and levels of traffic congestion, many jurisdictions, including Santa Cruz County, use the LOS measurement. LOS is a scale that describes the level of traffic congestion and delay at intersections or on roadway segments based on the amount of auto traffic that a roadway or intersection can accommodate and factors such as maneuverability, driver dissatisfaction, and delay. Traffic flows along local streets typically are controlled by the volume and capacity of the nearest intersection. Intersections are rated based on a scale of LOS A through LOS F, with LOS A representing free-flowing conditions and LOS F

representing congested conditions. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes.

The Santa Cruz County General Plan Circulation Element Policy 3.12.1 considers LOS C as its objective and LOS D as the minimum acceptable LOS (County of Santa Cruz 1994). Caltrans, which has jurisdiction over state highways, endeavors to maintain a target LOS at the transition between LOS C and D. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If a state highway facility is operating at less than the appropriate target LOS under existing conditions, the existing LOS should be maintained (Caltrans, 2002).

Existing Annual Average Daily Traffic Volumes

Traffic count data are available for state highways and arterials within Santa Cruz County. According to the most recent available traffic count data from Caltrans (2019), average daily traffic volumes for the most-traveled segments of Highways 9 and 17 within Santa Cruz County were 25,000 and 85,000 vehicles, respectively (Caltrans, 2019). Truck volumes on the most-traveled segments of Highways 9 and 17 within Santa Cruz County were 1,800 and 2,100 trucks per day, respectively (Caltrans, 2019).

Table 4.11-1 shows the average annual daily traffic (AADT) for roadways in the Project vicinity based on 2019 data where available. The County of Santa Cruz keeps a geographic information system (GIS) with traffic count data that they have received or conducted. The County GIS map provided traffic counts for Graham Hill Road, Sims Road, and Mount Hermon Road. Traffic on Graham Hill Road and Sims Road were counted in 2019 while Mount Hermon Road was counted in 2012 (HDR 2021). The most recent County data (2019) identify approximately 3,700 ADT on Glen Arbor Road. The table also shows projected volumes in the year 2024 based on forecasts in the SCCRTC's traffic model. The SCCRTC travel demand model was used to develop a growth rate between the 2019 and 2040 volume outputs. The growth rate was calculated as 0.8% per year, which was used to estimate traffic volumes in the year 2024 when several of the Proposed Project pipeline sections would be under construction.

Table 4.11-1. Roadway Average Annual Daily Traffic Volumes

Road	Existing (Year)	Future (2024)
Graham Hill Road	14,980 (2019)	15,600
Mount Hermon Road	19,130 (2012)	21,060
Sims Road	4,140 (2019)	4.310
Highway 9	8,860 (2019)	9,230
Highway 17	89,670 (2019)	93,340

Source: HDR 2021.

4.11.1.4 Planned Transportation System Improvements

Metropolitan Transportation Improvement Program

AMBAG, as the designated Metropolitan Planning Organization (MPO) for the Monterey Bay area, is required by state and federal laws to develop and adopt a Metropolitan Transportation Improvement Program (MTIP), a multi-year transportation project program that includes multi-modal projects, including but not limited to major

highway, arterial, transit, bikeway, and pedestrian projects. The 2016 MTIP is a four-year program that covers the federal fiscal years from October 1, 2016 through September 30, 2020. The MTIP implements the 2040 Monterey Bay Area Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) adopted by the AMBAG Board of Directors in June 2018. The 2040 MTP/SCS is a financially constrained document and includes identified transportation improvement projects for the region. Planned projects along access routes to the NCP include: pavement maintenance and replacement along a segment of Mt. Hermon Road; pavement maintenance on Glen Arbor Road; and multimodal improvements on Graham Hill Road from the City of Santa Cruz to Highway 9. AMBAG is in the process of preparing the 2045 MTIP.

Regional Transportation Plan Improvements

The SCCRTC periodically completes a Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) according to state guidelines to guide short- and long-range transportation planning and project implementation for the County. The 2018 RTP provides guidance for transportation policy and projects through the year 2040. Projects identified in the RTP that are within the project vicinity include the long-term improvements listed below. Improvements that are currently programmed and funded are included in the cumulative projects list shown on Table 4.0-1 in Section 4.0, Introduction to Analysis.

- Glen Arbor Road Improvements: Roadway and roadside improvements on the entire length of Glen Arbor Road, including bicycle lanes, transit turnouts, left turn pockets, merge lanes, and intersection improvements. Roadwork includes major rehabilitation of the road and roadsides.
- Glen Arbor Road Recycle, Overlay, and Chip Seal: Pavement recycling, asphalt overlay, ship seal, restriping, and installation of a subdrain on 0.52 miles of Glen Arbor Road from Highway 9 to Quail Hollow Road.
- Graham Hill Road Multimodal Improvements: From the City of Santa Cruz to Highway 9, bicycle lanes, sidewalks, transit turnouts, merge lanes, traffic signals, major rehabilitation and maintenance, drainage improvements, and a signal upgrade at Highway 9 (also listed in MTP/SCS).
- Mount Hermon Road Improvements: Roadway and roadside improvements from Lockhart Gulch to Graham Hill Road, including bicycle lanes, transit turnouts, left turn pockets, merge lanes, and intersection improvements (also listed in MTP/SCS).
- Quail Hollow Road Bridge Replacement Project: Complete replacement of the existing two-lane structure and roadway approaches with a two-lane, clear-span, concrete bridge and standard bridge approaches (also listed in County CIP).
- Quail Hollow Road Improvements: Road rehabilitation, maintenance, and improvements along the entire length of Quail Hollow Road from East Zayante Road to Glen Arbor Road, including left lane pockets, sidewalks, bicycle lanes, and transit turnouts.
- Rancho Rio Ave at Newell Creek Bridge Replacement Project: Replacement of the existing one-lane structure and roadway approaches with a two-lane, clear-span, concrete slab bridge and standard bridge approaches (also listed in County CIP).
- San Lorenzo River Valley Trail: 15-mile, paved multi-use path for bicyclists and pedestrians from Boulder Creek to Santa Cruz.
- San Lorenzo Valley Trail: Highway 9 – Downtown Felton Bike Lanes & Sidewalks: Installation of sidewalks and bicycle lanes on Highway 9 through downtown Felton (also listed in MTP/SCS).

- San Lorenzo Valley Trail: Highway 9 – North Felton Bike Lanes & Sidewalks: Installation of sidewalk/pedestrian path, shoulder widening to 5 feet to accommodate bicycle lanes from Felton-Empire/Graham Hill Road to Glen Arbor Road, Ben Lomond, including new and replacement bicycle and pedestrian bridges (also listed in MTP/SCS).
- San Lorenzo Way Bridge Replacement Project: Replacement of the existing one-lane structure and roadway approaches with a two-lane, clear-span bridge and standard bridge approaches (also listed in County CIP).
- Highway 17 Access Management: Operational improvements to existing facilities, including ramp modifications, acceleration/deceleration lanes, turning lanes, driveway consolidation, driveway channelization, etc.

Santa Cruz County Planned Improvements

The County's Final 2020-2021 Capital Improvement Program (CIP) presents a five-year financing implementation plan for capital improvements within the unincorporated County. Programmed projects nearest to the Proposed Project sites include the Lompico Road Bridge Replacement over Lompico Creek north of Felton, the Rancho Rio Avenue Bridge Replacement over Newell Creek in Ben Lomond east of the Proposed Project, the Quail Hollow Road Bridge Replacement over Zayante Creek east of the Proposed Project, and the San Lorenzo Way Bridge Replacement over the San Lorenzo River west of the Proposed Project.

Planned State Highway Improvements

Highway 17

Highway 17 connects Santa Cruz with Scotts Valley and San Jose and other Santa Clara County communities. Unlike other expressways or freeways, Highway 17 provides local access to many neighborhoods via local street intersections and driveways. Because of this contrast, several challenges stem from an imbalance between access and mobility, and mountainous terrain further limits many standard transportation projects. As a result of these issues, Caltrans has partnered with SCCRTC and Santa Cruz County on the Highway 17 Access Management Plan to address these challenges. The Highway 17 Access Management Plan represents a long-range planning-level study, which is the first step in a long process. The preliminary objectives of the plan include reducing conflict points and preserving the function and operation of the Highway 17 corridor as well as the local road network.

Highway 9

The *Transportation Concept Report for State Route 9* (Caltrans 2007) identifies long-range needs for active transportation on Highway 9. The SCCRTC's *Highway 9/San Lorenzo Valley Complete Streets Corridor Plan* is a planning study that provides a vision, guiding principles, and realistic strategies to improve how people get around the SLV. This plan focuses on the section of Highway 9 which serves as the "Main Street" and economic center for the towns, villages, and communities of Felton, Ben Lomond, Brookdale, and Boulder Creek, as well as connecting county maintained roads (SCCRTC 2019). Priorities identified in the plan improve safety for pedestrians, bicyclists and motorists; improve access to schools, businesses, residences, and transit; and improve traffic operations throughout this travel corridor. Some of the highest priorities for the corridor in the vicinity of the Proposed Project sites include the following:

- SLV Schools Campus Circulation: Improve traffic flow and bike and pedestrian access to SLV elementary, middle, and high schools
- Highway 9/Graham Hill Road Intersection: Redesign intersection to improve circulation, pedestrian, and bicycle access through the intersection
- Felton: Pedestrian, roadway, and parking modifications
- Ben Lomond: multimodal improvements in the town center and Highlands Park connection on Highway 9

4.11.2 Regulatory Framework

4.11.2.1 Federal

There are no federal regulations related to transportation that are directly applicable to the Proposed Project.

4.11.2.2 State

Caltrans manages the state's highway facilities. Caltrans is responsible for constructing, enhancing, and maintaining the state highway and interstate freeway systems. Any change to the state roadway system requires an encroachment permit from Caltrans.

California Senate Bill 743

On September 27, 2013, Senate Bill (SB) 743 was signed into law, which created a process to change the way transportation impacts are analyzed under the California Environmental Quality Act (CEQA). SB 743 required the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative to level of service (LOS) as the metric for evaluating transportation/traffic impacts. Under the new transportation guidelines, LOS or vehicle delay, will no longer be considered an environmental impact under CEQA. Amendments to the CEQA Guidelines required under SB 743 were approved on December 28, 2018, and the new section 15064.3 identifies vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA and is currently being implemented as of July 1, 2020. Related legislation, SB 32 (2016) requires California to reduce greenhouse gas emissions 40% below 1990 levels by 2030. The California Air Resources Board has determined that it is not possible to achieve this goal without reducing VMT growth and specifically California needs to reduce per capita VMT across all economic sectors. SB 743 is primarily focused on passenger-cars and the reduction in per capita VMT as it relates to individual trips.

The OPR Technical Advisory (OPR 2018) provides guidance and tools to properly carry out the principles within SB 743 and how to evaluate transportation impacts in CEQA. Both the City and County of Santa Cruz have adopted VMT thresholds as described in Section 4.11.2.3.

4.11.2.3 Local

A number of regional and local agencies are involved with transportation planning and implementation of transportation programs and improvements within the Santa Cruz County. The County maintains local

roadways and transportation facilities. As previously indicated, Caltrans has jurisdiction over state highway segments that traverse the County, including portions of Highways 9 and 17.

AMBAG is the federally designated MPO for transportation planning activities in the tri-county Monterey Bay region (Santa Cruz, Monterey, and San Benito counties). It is the lead agency responsible for developing and administering plans and programs to maintain eligibility and receive federal funds for the transportation systems in the region. AMBAG conducts regional transportation planning activities through the MTP, maintenance of a regional travel demand model, and demographic forecasts. AMBAG works with regional transportation planning agencies, transit providers, state and federal governments, and organizations having interest in or responsibility for transportation planning and programming.

The SCCRTC is the state-designated Regional Transportation Planning Authority for transportation planning activities in Santa Cruz County. SCCRTC oversees planning and funding programs for local and countywide projects within Santa Cruz County using state and federal transportation funds.

City of Santa Cruz

SB 743 Implementation - VMT Threshold

On June 9, 2020 the City of Santa Cruz City Council enacted Resolution NS-29, which adopts a VMT threshold as the new transportation measure of environmental transportation impacts. The threshold generally establishes that a project exceeding a level of 15% below the County-wide average VMT may result in a significant transportation impact. The City has published procedures and guidelines for how best to implement SB 743 and VMT analysis for projects occurring within the City (City of Santa Cruz 2020). VMT is analyzed based on the type of land use and then screened for non-significant transportation impacts. The guidelines closely follow the recommendations and procedures as stated in the OPR Technical Advisory document described in Section 4.11.2.1. For projects not screened out for non-significant transportation impacts, a VMT analysis utilizing the City's Travel Demand Model is required. The Travel Demand Model estimates daily trips based on various trip purposes within each Traffic Analysis Zone (TAZ) as well as local demographics based on employment and population. Finally, Transportation Demand Management (TDM) strategies and VMT reduction based on the land use analyzed are available to reduce VMT to less-than-significant levels.

General Plan

As required by State of California law, the City of Santa Cruz has adopted the General Plan 2030 document as the most recent update to their general plan (City of Santa Cruz 2012). Within the General Plan, the Mobility Element sets forth policies to ease the ability of people and vehicles to move around the City (City of Santa Cruz 2012). Specific policies identified in the Circulation Element that are relevant to the Proposed Project are identified below.

- M3.2.1 Maintain the condition of the existing road system.
- M3.2.2 Ensure safe and efficient arterial operations.

County of Santa Cruz

SB 743 Implementation - VMT Threshold

The County of Santa Cruz adopted a VMT threshold in 2020 and has published guidelines for the implementation of SB 743 as it pertains to VMT (County of Santa Cruz 2020). Similar to what is described in the OPR Technical Advisory and the City's VMT threshold, the County's VMT threshold generally establishes that a project exceeding a level of 15% below the County-wide average VMT may result in a significant transportation impact. The County Guidelines indicate that the VMT analysis process is based on the type of land use and can be screened out for a less-than-significant transportation impact based on a variety of factors, including: small projects, projects near high quality transit, local-serving retail, affordable housing, local essential services, map-based screening, and specified redevelopment projects.

If a project is unable to be screened out, and is not within an area where average VMT is below or at the County's VMT threshold level as indicated by the map-based screening figures located within the County's VMT guidelines, then further analysis is required by utilizing the County's "Sketch Planning Tool" or otherwise having a qualified transportation consultant analyze the project's VMT by using the Santa Cruz County Travel Demand Model. The Santa Cruz County Travel Demand Model estimates daily trips based on various trip purposes within each TAZ as well as local demographics based on employment and population. Finally, TDM strategies and VMT reduction based on the land use analyzed are available to reduce VMT to less-than-significant levels.

General Plan

As required by State of California law, the County has adopted a General Plan and Local Coastal Program that work in tandem with each other to create and address goals and policies as related to the transportation system of the County. Within the General Plan, the Circulation Element serves as the key policy statement of the County regarding transportation facilities serving unincorporated areas (County of Santa Cruz 1994). The Circulation Element contains several policies and programs that fulfill this purpose..

- **3.12.1. Level of Service (LOS) Policy:** In reviewing the traffic impacts of proposed development projects or proposed roadway improvements, LOS C should be considered the objective, but LOS D as the minimum acceptable (where costs, right-of-way requirements, or environmental impacts of maintaining LOS under this policy are excessive, capacity enhancement may be considered infeasible). Review development projects or proposed roadway improvements to the Congestion Management Program network for consistency with Congestion Management Plan goals.

  Proposed development projects that would cause LOS at an intersection or on an uninterrupted highway segment to fall below D during the weekday peak hour will be required to mitigate their traffic impacts. Proposed development projects that would add traffic at intersections or on highway segments already at LOS E or F shall also be required to mitigate any traffic volume resulting in a 1% increase in the volume/capacity ratio of the sum of all critical movements. Projects shall be denied until additional capacity is provided or where overriding finding of public necessity and or benefit is provided.

Encroachment Permits

For any construction in the public right-of-way, the County requires an encroachment permit. The associated fee and permit process are described in the Santa Cruz County Code, Chapter 9.70, Streets and Roads. As part of the encroachment permit process, if pedestrian, bicycle, or vehicle traffic would be impacted, a traffic control plan must be provided. Several provisions are provided on the encroachment permit application (County of Santa Cruz 2021a).

4.11.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to transportation. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.11.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to transportation are based on Public Resources Code Section 15064.3, Appendix G of the CEQA Guidelines and the VMT thresholds and Implementation Guidelines adopted by Santa Cruz County and the City of Santa Cruz described in Section 4.11.2.3, A significant impact would occur if the Proposed Project would:

A. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
B. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b).
C. Cause an increase in VMT which is greater than 15% below the regional average VMT.
D. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
E. Result in inadequate emergency access.
F. Substantially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

4.11.3.2 Analytical Methods

The impact analyses in this section evaluate the potential for construction-related traffic impacts. Project construction would over multiple years, with the first construction period occurring between approximately late 2022/early 2023 and early 2025, and the remaining pipe sections in the northern segment would be constructed in 2030 to 2032. The construction phases of the Proposed Project are analyzed based on the construction scenario developed in Chapter 3, Project Description, and summarized on Table 3-4.

The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first with an estimated construction schedule of about 24 months for the Graham Hill Road sections and

approximately 9 months for the Brackney North section, including pipeline installation, road repaving, abandonment of the existing NCP, and post-construction revegetation where needed.

Construction would be scheduled on weekdays generally between 8 AM and 5 PM, except construction along Graham Hill Road would be scheduled on weekdays between the hours of 8 AM and 4 PM with road lane closures only permitted between 9 AM and 3 PM, consistent with County of Santa Cruz encroachment permit requirements.

Once the Proposed Project construction is complete, operations would include continued implementation of pump start-up and valve operations at the Felton Booster Pump Station, when needed to pump water to/from Loch Lomond Reservoir as currently exists. Once installed, maintenance of the pipeline would include intermittent, periodic inspections and maintenance of air valves with access provided to the pipeline sections by existing roads and easements. The Brackney North pipeline section likely would have air valves on either end of the new pipeline and would not need to be accessed in the future unless removed for replacement. No new unpaved areas would be created that would require maintenance.

Application of Relevant Standard Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize impacts. However, there are no City Standard Construction Practices applicable to transportation that are part of the Proposed Project.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.11.3.3 Project Impact Analysis

Areas of No Impact

The Proposed Project would not have impacts with respect to the following thresholds of significance as described below.

- **Geometric Design Hazards (Significance Threshold D)**. The Proposed Project would not result in operation of new facilities and would not change existing roadway configurations or designs. Therefore, the Proposed Project would not result in direct permanent impacts associated with hazardous design features, such as sharp curves or dangerous intersections or incompatible land uses.

Project Impacts

Impact TRA-1: Conflict with Program, Plan, Ordinance, or Policy Addressing the Circulation System (Significance Threshold A). Construction and operation of the Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. ***(Less than Significant)***

Construction

All of the Proposed Project pipeline section locations are located within unincorporated Santa Cruz County. Construction-related trips would use roadways immediately adjacent to the pipeline sections, as well as other local and regional roads and highways to access the construction site.

There are no known programs, plans, ordinances or policies that address effects construction activities on the circulation system, including, transit, road, bicycle or pedestrian facilities. During construction, there would be temporary lane closures during weekdays along Graham Hill Road in the Proposed Project southern segment, and potentially along Glen Arbor Road and Newell Creek Road in the Proposed Project northern segment. Traffic controls would be implemented to minimize traffic delays. There would be overlapping construction schedules with the Graham Hill Road and Brackney North sections, resulting in temporary construction trips as summarized on Table 4.11-2 in Impact TRA-4. However, these trips would not create a measurable impact to any roadway or intersection in the area and would not conflict with the County of Santa Cruz's LOS policy. Construction would result in temporary traffic that would be eliminated from the roadway network upon completion of construction, and the Proposed Project does include widening or inducing travel on County roadways. Construction would not affect bicycle or pedestrian facilities as none exist in the areas of proposed construction. Construction-related trips and lane closures could result in temporary delays, but would not impede service. Further, construction of the Proposed Project would not conflict with any of the planned multimodal improvements in the area discussed in Section 4.11.1.4. Effects of construction-related trips and lane closures on emergency access is discussed in Impact TRA-3.

Operations

Once Project construction is complete, operations would entail routine inspection and maintenance by City staff as currently exists for the existing NCP with no expected increase in daily vehicle trips. Thus, roadway operations in the area would not substantially differ from existing conditions. The Proposed Project would not increase roadway capacity, generate a permanent increase in traffic, or change traffic patterns that could cause an impact to the circulation system including transit, roadway, bicycle, and pedestrian facilities. Therefore, operation of the Proposed Project would not conflict with adopted policies, plans, or programs addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities. As such, construction and operation of the Proposed Project would result in a less-than-significant impact.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to conflicts with adopted policies addressing the circulation system, and therefore, no mitigation measures are required.

Impact TRA-2: Vehicle Miles Traveled (Significance Thresholds B and C). Construction and operation of the Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause an increase in VMT that exceeds City and County thresholds (greater than 15% below the regional average VMT). ***(Less than Significant)***

The Proposed Project would not result in operation of new facilities or increases in trips associated with routine maintenance and operations, and therefore, would not directly generate new VMT or conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b). Therefore, Project operations would have no direct impacts related to changes in VMT. The Proposed Project would result in temporary increased trips during construction, but once completed, would not generate increased trips aside from existing maintenance of the NCP.

CEQA Guidelines Section 15064.3(b) focuses on VMT for determining the significance of transportation impacts. It is further divided into four subdivisions: (1) land use projects, (2) transportation projects, (3) qualitative analysis, and (4) methodology. The Proposed Project is not a land use or transportation project, and therefore, would be categorized under (3), qualitative analysis, as this Subdivision (b)(3) recognizes that lead agencies may not be able to quantitatively estimate VMT for every project type. In these situations, lead agencies are directed to evaluate factors such as the availability of transit, proximity to other destinations, and other factors that may affect the amount of driving required by the project. Additionally, Subdivision (b)(3) indicates that a qualitative analysis of construction traffic is often appropriate.

A qualitative analysis of VMT is provided in this analysis because the Proposed Project consists of temporary construction-related trips as described in Impact TRA-3. The construction of the Proposed Project would not generate any permanent trips and would not require widening of existing roadways or construction of new roadways. Once construction is completed, VMT would return to pre-project conditions and all temporary, construction-related VMT would be eliminated. Therefore, construction of the Proposed Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) and impacts would be less than significant.

OPR's Technical Advisory provides several "screening thresholds" that may be applied to identify land use projects that should be expected to cause a less-than-significant VMT impact without detailed study; specifically, the "screening threshold for small projects" states that projects that generate fewer than 110 daily trips generally may be assumed to cause a less-than-significant impact (OPR 2018). As of October 2020, the County of Santa Cruz has published guidelines for the implementation of SB 743, along with screening criteria that uses the guidance published within the OPR technical advisory as a reference point. Specifically, the guidance excludes from further analysis "small projects" that generate fewer than 100 net new trips per day. The City of Santa Cruz also has developed implementation guidelines for SB 743, including the same screening criteria that excludes "small projects" that generate less than 110 trips per day from further analysis, which matches the recommended guidance within the OPR Technical Advisory. However, neither OPR nor the County or City's VMT guidelines provide additional guidance for temporary, construction-related trips. Construction traffic and trips would be completely eliminated upon completion of construction, and therefore, there would be no permanent daily trips added to County roadways and VMT would not be increased due to the Proposed Project.

Therefore, Proposed Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause an increase in VMT which is greater than 15% below the regional average VMT, the VMT threshold adopted by both the City and County. Therefore, impacts would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to increased VMT, and therefore, no mitigation measures are required.

Impact TRA-3: Emergency Access (Significance Thresholds E, and F). Construction of the Proposed Project would not result in inadequate emergency access or impair implementation of or interfere with an emergency evacuation plan. ***(Less than Significant)***

The Proposed Project would be constructed along roadways within the unincorporated area of Santa Cruz County. The construction of the Project would result in a temporary increase in local trips as a result of construction-related workforce traffic, material deliveries, and construction activities. The primary impacts would include short-term and intermittent delays due to lane closures. All construction traffic and parking would occur within designated staging areas as shown on Figures 3-6, 3-9, 3-10, 3-11, and 3-19 in Chapter 3, Project Description.

Construction of the first three pipe sections (Brackney North, Graham Hill North and Graham Hill South) were evaluated as they have overlapping construction schedules, which would involve trips related to equipment, materials, and workers using the same roadways. The construction activities would occur primarily between 9:00 AM and 3:00 PM, Monday through Friday along Graham Hill Road and from approximately 8 AM to 5 PM for the other Proposed Project pipe sections. To provide a conservative analysis, all workers were assumed to arrive during the AM peak hour and leave the site during the PM peak hour and all truck trips were averaged for an 8-hour workday to estimate peak hour trips, except the Graham Hill Road pipe sections would have a 7-hour work day. The number of truck trips were converted using Passenger Car Equivalency (PCE) factors to more accurately account for the effect of construction trucks on the circulation system. All truck trips were converted to PCE trips using a factor of 2.0 PCE for vendor trucks and 3.0 PCE for haul trucks. The trip generation estimates of the overlapping construction phases that constitute the peak construction phase are shown in Table 4.11-2.

As shown in Table 4.11-2, the Proposed Project peak phase of construction activities would generate approximately 104 to 156 daily trips, 34 to 44 AM peak hour trips (32 to 37 inbound and 2 to 7 outbound), and 34 to 44 PM peak hour trips (2 to 7 inbound and 34 to 44 outbound). With the application of PCE factors to truck trips, the Proposed Project would generate approximately 172 to 316 total PCE daily trips, 48 to 68 PCE trips during the AM peak hour (39 to 49 inbound and 9 to 19 outbound) and 48 to 68 PCE trips during the PM peak hour (9 to 19 inbound and 39 to 49 outbound). This table shows the trips generated during construction of the first three pipe sections. Future installation of the other pipe sections in the northern segment would result in fewer trips as there are no overlapping construction schedules as shown on Table 3-4 in Section 3, Project Description.

Table 4.11-2: Estimated Maximum Daily and Peak Hour Project Construction Trips[1]

Vehicles Generated		Daily[2]	AM Peak Hour			PM Peak Hour		
Type	Amount	Trips	In	Out	Total	In	Out	Total
Brackney North Section								
Workers	12 vehicles	24	12	0	12	0	12	12
Deliveries	6-8 vehicles	12-16	0-1	0-1	0-2	0-1	0-1	0-2
Haul Materials	1-5 vehicles	2-10	0-1	0-1	0-2	0-1	0-1	0-2
Graham Hill Road Sections								
Workers	18 vehicles	36	18	0	18	0	18	18
Deliveries	8-16 vehicles	8-16	0-1	0-1	0-2	0-1	0-1	0-2
Haul Materials	22-54 vehicles	22-54	2-4	2-4	4-8	2-4	2-4	4-8
TOTAL TRIPS		**104-156**	**32-37**	**2-7**	**34-44**	**32-37**	**2-7**	**34-44**
PASSENGER-CAR EQUIVLAENCE (PCE)								
Brackney North Section								
Workers	12 vehicles	24	12	0	12	0	12	12
Deliveries (2.0 PCE)	6-8 vehicles	24-32	1-2	1-2	2-4	1-2	1-2	2-4
Haul Materials (3.0 PCE)	1-5 vehicles	6-30	1-3	1-3	2-6	1-3	1-3	2-6
Graham Hill Road Sections								
Workers	18 vehicles	36	18	0	18	0	18	18
Deliveries (2.0 PCE)	8-16 vehicles	16-32	1-2	1-2	2-4	1-2	1-2	2-4
Haul Materials (3.0 PCE)	22-54 vehicles	66-162	6-12	6-12	12-24	6-12	6-12	12-24
TOTAL PCE TRIPS		**172-316**	**39-49**	**9-19**	**48-68**	**9-19**	**39-49**	**48-68**

Notes: PCE = Passenger Car Equivalents.

1 This table shows the first trips generated during construction of the first three pipe sections. Future development in the other pipe sections in the northern segment would result in fewer trips as there are no overlapping construction schedules.

2 Daily trips represent the number of trips to and from the project component site (i.e., two trips represent one vehicle traveling to the work area and leaving the work area).

SOURCE: City of Santa Cruz Water Department, Carollo Engineers, Mott MacDonald

All construction traffic that would be generated as a result of the Proposed Project would be temporary. However, installation of the Proposed Project within public roadways would require temporary lane closures in some locations with implementation of traffic controls established in a traffic control plan. Construction and staging areas would be located to not block any egress or ingress points to existing roads or private driveways, except when construction occurs immediately adjacent to private properties. The following project components could result in temporary lane closures: project mobilization, trenching for pipe installation, road repaving, and revegetation, if needed adjacent to roadways.

Due to pipe installation in roadways, it is expected that temporary lane closures and traffic controls would be required for the following pipeline sections as further described below:

- Northern segment: Newell Creek Road, Glen Arbor Drive, San Lorenzo Way sections
- Southern segment: Graham Hill Road North and South sections.

Northern Segment

Construction of the Brackney North pipe section may require intermittent road closures, however the majority of construction activities would take place off-road and would not require road closures. Construction vehicles

going to the construction site have access using Glen Arbor Road and Brackney Road. The signal at the Highway 9/Glen Arbor Road intersection would allow construction haul trucks to access the northern end of the Brackney North construction site. The Highway 9/Brackney Road intersection is at an angle which could present a safety issue for construction haul trucks leaving the site and turning right or left onto Highway 9. It is estimated there would be 16 construction haul trucks accessing the site using Brackney Road per day for nine months during construction. Traffic flaggers would be utilized to stop traffic to allow construction haul trucks to safely exit Brackney Road. The traffic flaggers would follow standards outlined by California Manual on Uniform Traffic Control Devices (CA MUTCD) (HDR 2021).

Daily, temporary and intermittent road closures are also anticipated when construction occurs in the Newell Creek Road and Glen Arbor Road pipe sections. It is expected that one lane would be closed during the daily work period with traffic controls as established in a traffic control plan that would be required by the County. Different segments of the road lanes would be closed as needed as the pipeline installation progresses down the roadway.

Southern Segment

Construction of the Graham Hill Road North and South sections would require closure of one lane during the work period (9 AM to 3 PM) on weekdays. Traffic controls would be implemented in accordance with a Traffic Control Plan required as part of issuance of a County roadway encroachment permit. The temporary lane closure on Graham Hill Road was analyzed to determine the impacts the construction activities would have on vehicles traveling on Graham Hill Road (HDR 2021). Conservatively, the construction activity was analyzed for 2024 model traffic. The following assumptions were made for the construction analysis: 1) full road closure would not be required; 2) typical work hours are from 9:00 AM to 3:00 PM; and 3) the road needs to be cleared by 4:00 PM in accordance with County requirements (HDR 2021).

A one-way, two-lane analysis was conducted for the typical day from 9:00 AM to 3:00 PM. The analysis assumed a 25 miles per hour posted construction speed limit and a 25-foot spacing for queue vehicles. It is recommended that the closure length be 0.5-mile or less as the additional delay and queue would not impact the residential nature of Graham Hill Road as much as larger closure lengths, which would result in the road exceeding capacity (at 0.8-mile of closure) during certain hours or excess queue lengths (at 0.75-mile of closure). Also, there is not an hour in which the 0.5-mile closure would cause an overcapacity of the roadway which would lead to very long queues and delay times. The one-way two-lane operation would follow the California Manual on Uniform Traffic Control Devices for flagger, sign, and striping requirements (HDR 2021).

With a 0.5-mile or less closure length, there are not expected to be any vehicles diverting to other routes as the additional delay due to the temporary lane closure is less than the additional travel time required to divert around the work area. Therefore, the primary impact of construction activities for the Proposed Project southern segment would be on Graham Hill Road. Road detours during construction are not recommended as other roadways are congested and there would be no noticeable travel time savings (HDR 2021). However, changeable message signs would be set up in the north by the Graham Hill Road/Highway 9 intersection and in the south by Ocean Street in Santa Cruz to inform the public to expect delays on Graham Hill Road, as will be further specified in the traffic control plan (HDR 2021).

Traffic Control Plans

Where construction would take place in public roadways, encroachment permits would need to be obtained in most cases from the County of Santa Cruz for work done within the public right-of-way, as described in Section 4.11.2.3, Local Regulatory Setting. The issuance of encroachment permits requires submission of traffic control plans. Implementation of these plans and requirements would ensure that access for emergency vehicles would be maintained during construction. The project areas of construction would be accessible to emergency responders and associated vehicles during construction and operation of the Proposed Project. Typical components of a traffic control plan that are proposed to be included in the traffic control plan for construction along Graham Hill Road include:

- Temporary traffic control devices or flaggers in accordance with the Federal Highway Administration Manual on Uniform Traffic Control Devices
- Notification to the appropriate jurisdiction to identify locations where construction is ongoing. This may include slow-moving-vehicle warning signs, signage to warn of merging trucks, barriers for separating construction and non-construction traffic, use of traffic control flag personnel during temporary lane closures, and any additional measures required for the sole convenience of safely passing non-construction traffic through and around construction areas.
- Scheduling of heavy truck traffic hauling materials and equipment to the site during non-peak periods to the maximum extent possible. Scheduling of worker shift changes so as not to coincide with existing background traffic peak periods if feasible.
- Establish procedures for coordinating with local emergency response agencies to ensure dissemination of information regarding emergency response vehicle routes affected by construction activities to ensure accessibility at all times in case of emergency.
- Limit lane closures during peak traffic periods.

Construction of the Proposed Project would comply with all applicable local requirements for work within and along public rights-of-way (ROWs), and with implementation of the required traffic control plan, would not result in inadequate emergency access. Roadways would remain open, and with traffic controllers, emergency vehicles would have access maintained during the daily construction period when lane closures would occur. Similarly, the Proposed Project would not increase operational traffic and vehicle trips associated with routine maintenance of facilities, as described in Impact TRA-1. The Proposed Project would not obstruct implementation of evacuation routes during daily lane closures. In the event of a major emergency that would require area-wide evacuations, daily construction would be halted and lanes opened.

Additionally, the Proposed Project would not impair implementation of or interfere with an emergency evacuation plan. The Santa Cruz County Office of Response, Recovery & Resilience (OR3) was created in December 2020 and serves as the emergency management office for responding to ongoing disasters. Evacuations are frequently a response to natural disasters in order to protect people from potential harm. People may be evacuated because they are in the direct path of a natural disaster or because emergency responders may lose the ability to rescue residents due to road closures. The County uses a variety of methods to notify residents when an evacuation is necessary. These include reverse 911 calls, text or phone messages through Code Red (for those who have signed up) and/or door to door notifications. Evacuation areas are determined by the incident command team, who are in charge of responding to the disaster (Santa Cruz County Office of Response, Recovery & Resilience 2021).

Therefore, the Proposed Project's impacts associated with inadequate emergency access or obstruction of implementation of evacuation plans would be less than significant.

Mitigation Measures

The Proposed Project would not result in significant impacts related to inadequate emergency access or obstruction of evacuation plans, and therefore, no mitigation measures are required.

4.11.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative transportation impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic. The geographic area for the analysis of cumulative impacts related to transportation consists of the Proposed Project sites along various public roadways that would support haul truck, vendor truck, and worker vehicle access to the component sites.

Impact TRA-4: Cumulative Transportation Impacts (Significance Thresholds A, B, C, D, E, and F). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to transportation. ***(Less than Significant)***

The construction of the Proposed Project would occur over several phases, beginning in late 2022 and ending in 2031. As shown in Table 4.0-1, there are two cumulative projects that are located at or near the Project sites that could be under construction during this same period of time as the Proposed Project. Table 4.0-1 displays the estimated construction schedule for cumulative projects, where known. The only cumulative projects with an overlap of construction schedules are two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project). Other cumulative projects using roads within the Proposed Project construction areas would be completed before Proposed Project construction begins (Newell Creek Dam Inlet/Outlet Improvement Project and San Lorenzo Way Bridge Replacement) or would occur after completion of the Graham Hill Road pipe sections (intertie pipeline with Scotts Valley, for which no project timeline has been established).

Construction of the GHWTP projects would result in temporary increases in daily trips due to worker, delivery and haul trips, but would not use the portion of Graham Hill Road where the Proposed Project is located, except for the entrance to the GHWTP. The GHWTP cumulative projects would not require lane closures as construction would occur on the GHWTP site. Therefore, cumulative impacts related to transportation resulting from construction activities within/along Graham Hill Road would not be significant. Cumulative projects could add minimal trips related to operation and maintenance, but the Proposed Project would not add new operational trips, and thus would not contribute to cumulative operational transportation impacts. Therefore, construction and operation of the Proposed Project in combination with other cumulative projects would not be expected to conflict with adopted policies addressing the circulation system or conflict with or exceed VMT thresholds as there would be no cumulative impacts to roadways used during Project construction. Similarly, construction of the Proposed Project in combination with other cumulative projects would not be expected to create hazardous roadway conditions or inadequate emergency access as other cumulative projects are not expected to result in lane closures along Graham Hill Road, Glen Arbor Road, or Newell Creek Road. Therefore, no significant cumulative transportation impacts would occur.

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4.12 Wildfire

This section describes existing conditions pertaining to wildfire, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant or potentially significant impacts related to implementation of the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project). This analysis is based on a review of fire hazard severity zone maps and existing studies. Emergency response and evacuation issues are addressed in Section 4.11, Transportation.

A summary of the comments received during the scoping period for this environmental impact report (EIR) is provided in Table 2-1 in Chapter 2, Introduction, and a complete list of comments is provided in Appendix A. There were no comments related to wildfire.

4.12.1 Existing Conditions

4.12.1.1 Background

Wildfire has shaped California's ecosystems for millennia, recurring at varying intervals in virtually all of the state's vegetation types. Before Euro-American settlement, an estimated 4.5 to 12 million acres burned annually across the state. Natural fire regimes have changed dramatically due to land management practices and a century of effective fire suppression, which, in conjunction with climate change and expanding development, have led to increased wildfire impacts on ecosystems and people (California Department of Forestry and Fire Protection [CAL FIRE] 2018).

A wildfire is a nonstructural fire that occurs in vegetative fuels, excluding prescribed fire. Various factors contribute to the intensity and spread of wildfires: humidity, wind speed and direction, vegetation type, the amount of vegetation (i.e., fuel), and topography. While wildfires are a natural component of California's fire-adapted ecosystems, they represent a hazard where development is adjacent to open space or within close proximity to wildland fuels or designated fire severity zones. Wildfires can occur in undeveloped areas and spread to urban areas where the landscape and structures are not designed and maintained to be ignition-resistant.

The wildland-urban interface (WUI), defined as the areas where urban development is located in proximity to undeveloped open space or "wildland" areas, has expanded rapidly in recent decades, with extensive residential development occurring in the fringes of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities. This pattern of development has implications for wildfire management and impact, as fire risk and damage potential are elevated in the WUI due to the abundance of both fuel and ignition sources. The increased number of homes and proximity to flammable landscapes can be a potentially dangerous situation in the event of a fire; fires that occur in the WUI pose the greatest risk to life and property.

The impacts of wildfire on a community are far-reaching. The most significant impacts would be loss of life, loss of property, and environmental damage. Air quality is also a major issue, which can force the closure of schools and businesses as well as limit human activity. Damage to infrastructure such as culverts, roads and bridges can be difficult to locate and repair in a timely manner. During the rainy season, burned-over areas are subject to mud slides and debris torrents which can be exacerbated by infrastructure damage. Sedimentation

due to winter rains after fire events can destroy fish habitats, which can have a catastrophic effect on the ecosystem (County of Santa Cruz 2015).

CAL FIRE has mapped areas of significant fire hazards in the state through its Fire and Resources Assessment Program (FRAP). These areas are referred to as Fire Hazard Severity Zones (FHSZs) and are identified for Federal Responsibility Areas (FRAs), where federal agencies have responsibility for wildfire protection, State Responsibility Areas (SRAs), where CAL FIRE has responsibility for wildfire protection, and Local Responsibility Areas (LRAs), where local fire protection agencies have responsibility for wildfire protection. Different FHSZs (moderate, high, and very high) are based on a hazard scoring system using subjective criteria for fuels, fire history, terrain influences, housing density, and occurrence of severe fire weather where urban conflagration could result in catastrophic losses. The speed and intensity of potential fires within the area, ability of embers to spread and multiply, loading of fuel, topographic conditions, and local climate all culminate to form the fire hazard severity for an area. Very high FHSZs are areas lacking adequate wildland and structural fire protection.

4.12.1.2 Wildfire Risk

The risk of significant wildfire exists in Santa Cruz County. Due to local topography, fuels (forest, chaparral, grasslands) and certain weather conditions, Santa Cruz County is prone to periodic large wildfire events. Annual cycles of elevated fire danger occur throughout the county, with the wildfire season typically extending from roughly May into late October or early November. Widespread densely forested areas with high fuel loading, chaparral, and grasslands contribute to danger from wildfire. Effective fire suppression and a lack of vegetation management over the last century have led to uncharacteristically high fuel loads. Vegetation in the county is dominated by dense second-growth redwood and mixed conifer forests typically having forest floor accumulations of litter and downed woody material and coastal scrub communities consisting of low vegetation up to 6 feet in height, typically occurring on coastal bluffs, coastal hills, and wind-swept summits. Scrub vegetation is usually dense and difficult to penetrate.

The boundary between residential/commercial development and wildland in the county is not clearly demarcated, and , and the county has substantial area in the WUI where wildfire risks are elevated (CAL FIRE San Mateo-Santa Cruz Unit [CZU] 2018). Due to the county's unique and diverse geography and microclimates suitable for vegetation to flourish, plus urban areas adjacent to—or integrated into—this dense vegetation, the county has substantial area in the WUI, where wildfire risks are elevated, and in high or very high FHSZs (Santa Cruz County Grand Jury 2020). The county has the largest percentage of WUI of all the counties in the State of California. Over 50% of the county's population lives in the WUI, encompassing a total of 167,442 residents and 71,855 homes (Santa Cruz County Civil Grand Jury 2020).

4.12.1.3 Wildfire Incidents

Each year, state, local, and volunteer departments throughout the region respond to numerous wildfires. The vast majority of these are held to less than one acre in size. The reasons for this include, but are not limited to: early identification and reporting, large fire suppression response (both local and state agencies), generally good access to fire areas, favorable fuels, favorable fire weather, and air support. However, when ignitions occur during unfavorable weather and/or in areas with poor access, fires can rapidly increase to an unmanageable size prior to fire resources arrival (CAL FIRE CZU 2018).

In 2008, the county experienced three large wildfires resulting in approximately 5,400 acres burned and numerous homes destroyed. In 2009, Santa Cruz County experienced two large wildfires resulting in approximately 8,500 acres damaging and destroying numerous homes and structures. In 2016, the Loma Fire burned 4,500 acres along the crest of the Santa Cruz Mountains adjacent to the Santa Clara/Santa Cruz county line. In 2017, the Bear Fire burned under 400 acres, destroyed seven structures and threatened hundreds in communities adjacent to Castle Rock State Park (CAL FIRE CZU 2018). Most recently, the CZU Lightning Complex fires of 2020 consisted of at least 22 lightning-induced wildfires, from Highway 9 north of Ben Lomond to the Pacific coastline. The fire burned over 86,000 acres in Santa Cruz and San Mateo counties and destroyed 1,490 structures (CAL FIRE 2020).

4.12.1.4 Fire Protection

Fire protection in California is the responsibility of the federal, state, or local government. Fire protection in LRAs is provided by the County, a city, or a designated fire protection district. Within SRAs, fire protection is provided by CAL FIRE. In general, SRA includes forest-covered lands, whether of commercial value or not, or brush or grass-covered lands and does not include lands within city boundaries or in federal ownership (County of Santa Cruz 2015). In FRAs, fire protection is the responsibility of the federal government. Figure 4.12-1shows the FRA, SRA, and LRA within Santa Cruz County. Most of the unincorporated area of the county is within the SRA, while the LRA includes the county's incorporated cities.

The County is served by 10 local fire protection districts, while the larger unincorporated areas of the County not covered by a special district are served by the Santa Cruz County Fire Department (SCCFD) in conjunction with CAL FIRE. Fire agencies have mutual aid agreements which enable them to help one another across jurisdictional boundaries when emergencies exceed local resources. Mutual aid is usually requested on an as-needed basis by the local incident commander. Mutual aid is typically voluntary, and may not occur if the requested agencies are dealing with incidents of their own and/or do not have enough equipment or firefighters to share at the time (Santa Cruz County Grand Jury 2020).

4.12.1.5 Wildfire Hazards in the Vicinity of Proposed Project

The Proposed Project pipeline alignment is within a moderate to high fire hazard severity zone (see Figure 4.12-1). Most of the northern segment of the proposed pipeline is within a moderate fire hazard severity zone, whereas much of the Graham Hill Road North pipe section of the southern segment is within a high fire hazard severity zone. Although most of the Project alignment is within a SRA, the southern portion of Graham Hill Road forms a boundary between a SRA on the west side of the road and a LRA, Unincorporated, on the east side of the road. Both sides of the road in this area are classified as moderate fire hazard severity zones (CAL FIRE 2007, County of Santa Cruz 2021). In addition to CAL FIRE's FHSZ mapping, the County of Santa Cruz also has mapped critical and mitigatable wildfire hazard areas due to accumulation of wildfire prone vegetation, steep and dry slopes, and the presence of structures vulnerable to wildland fires. These areas are generally situated in the steeper higher elevations of the County (County of Santa Cruz 2015), and are within the state-mapped hazard areas.

Portions of the pipeline route are also within local fire protection districts, including the Ben Lomond Fire Protection District, Felton Fire Protection District, Scotts Valley Fire District, and Zayante Fire Protection District.

In addition, the LRA on the east side of the southern portion of the Graham Hill Road pipe section is within the jurisdiction of the Santa Cruz County Fire Department.

4.12.2 Regulatory Framework

International Fire Code

The International Fire Code (IFC), created by the International Code Council, is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The IFC regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The IFC and the International Building Code use a hazard classification system to determine what measures are required to protect against structural fires. These measures may include construction standards, separations from property lines, and specialized equipment. To ensure that these safety measures are met, IFC employs a permit system based on hazard classification. The IFC is updated every three years.

4.12.2.1 Federal

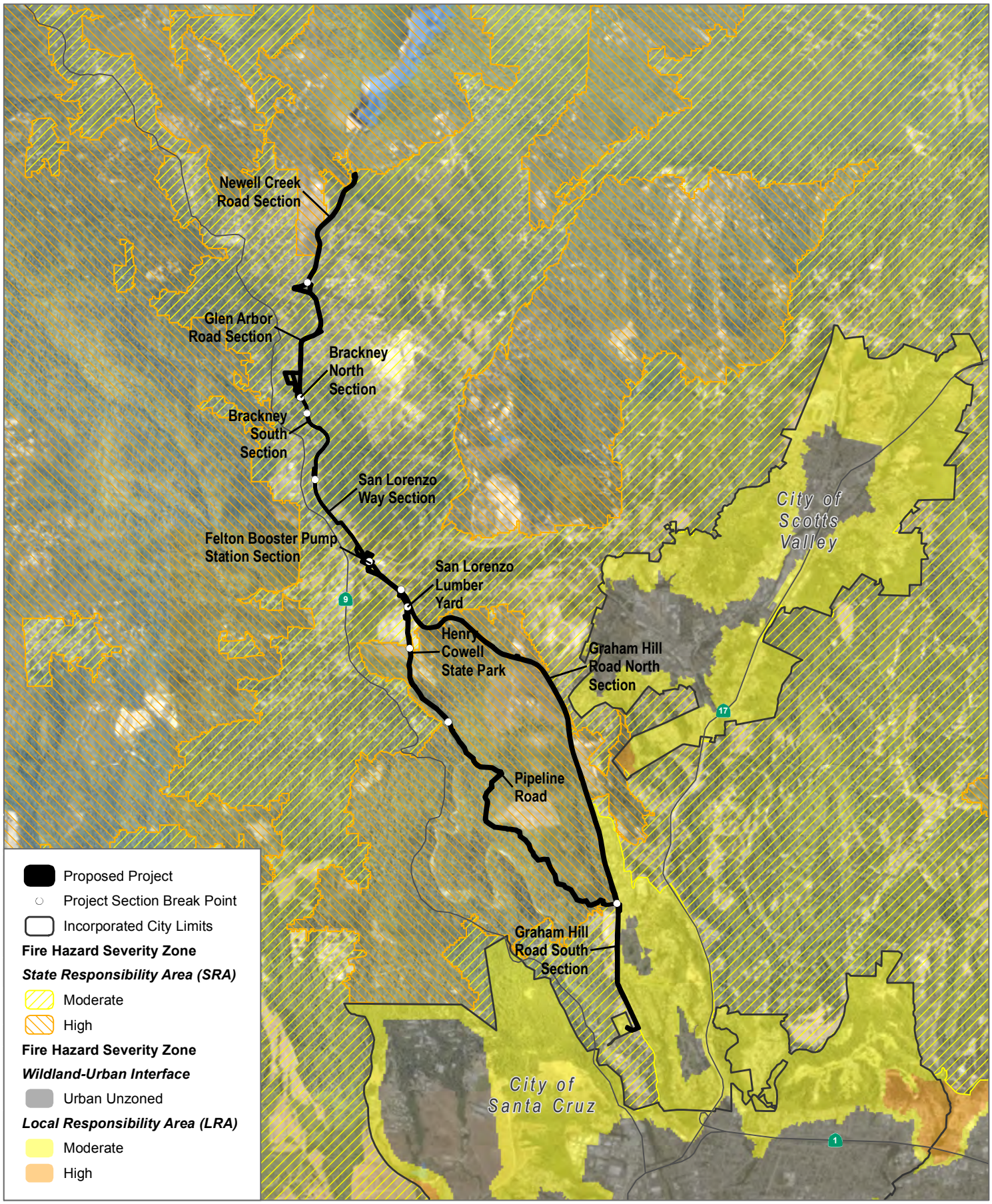
Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995 and updated in 2001 by the National Wildfire Coordinating Group, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgment of the essential role of fire in maintaining natural ecosystems.

National Fire Plan

The National Fire Plan was a Presidential directive in 2000 as a response to severe wildfires that had burned throughout the United States. The National Fire Plan focuses on reducing fire impacts on rural communities and assurance for sufficient firefighting capacity in the future. It is a long-term investment that will help protect natural resources in addition to communities, as well as a long-term commitment based on cooperation and communication among federal agencies, states, local governments, tribes, and interested members of the public. There are five key areas addressed under the National Fire Plan:

- Firefighting and Preparedness
- Rehabilitation and Restoration
- Hazardous Fuels Reduction
- Community Assistance
- Accountability



SOURCE: ESRI Imagry 2021, CAL FIRE 2020, Santa Cruz County 2021

DUDEK

0 0.5 1 Miles

FIGURE 4.12-1

Project Fire Hazard Zones

Newell Creek Pipeline Improvement Project

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Federal Response Plan

The Federal Response Plan of 1999, as amended in 2003 by FEMA, is a signed agreement among 27 federal departments and agencies, including the American Red Cross, that (1) provides the mechanism for coordinating delivery of federal assistance and resources to augment efforts of state and local governments overwhelmed by a major disaster or emergency; (2) supports implementation of the Robert T. Stafford Disaster Relief and Emergency Act, as well as individual agency statutory authorities; and (3) supplements other federal emergency operations plans developed to address specific hazards. The Federal Response Plan is implemented in anticipation of a significant event likely to result in a need for federal assistance or in response to an actual event requiring federal assistance under a presidential declaration of a major disaster or emergency.

4.12.2.2 State

California Department of Forestry and Fire Protection

CAL FIRE protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. CAL FIRE's firefighters, fire engines, and aircraft respond to an average of nearly 6,000 wildland fires that burn over 260,000 acres each year (CAL FIRE 2019). CAL FIRE is responsible for the protection of approximately 31 million acres of private land within the state and, at the local level, is responsible for inspecting defensible space around private residences. CAL FIRE is also responsible for enforcing State of California fire safety codes included in the California Code of Regulations and California Public Resources Codes (discussed further below).

The Office of the State Fire Marshal supports CAL FIRE's mission by focusing on fire prevention. It provides support through a wide variety of fire safety responsibilities including by regulating buildings in which people live, congregate, or are confined; by controlling substances and products which may, in and of themselves, or by their misuse, cause injuries, death, and destruction by fire; by providing statewide direction for fire prevention in wildland areas; by regulating hazardous liquid pipelines; by reviewing regulations and building standards; and by providing training and education in fire protection methods and responsibilities.

The Board of Forestry and Fire Protection (Board) is a government-appointed body within the CAL FIRE. It is responsible for developing the general forest policy of the state, determining the guidance policies of the CAL FIRE, and representing the state's interest in federal forestland in California. Together, the Board and the CAL FIRE work to carry out the California Legislature's mandate to protect and enhance the state's unique forest and wildland resources.

The Board is charged with protecting all wildland forest resources in California that are not under federal jurisdiction. These resources include major commercial and non-commercial stands of timber, areas reserved for parks and recreation, woodlands, brush-range watersheds, and all private and state lands that contribute to California's forest resource wealth.

CAL FIRE 2018 Strategic Fire Plan

Public Resources Code Sections 4114 and 4130 authorize the State Board of Forestry to establish a fire plan (The 2018 Strategic Fire Plan for California) that establishes the levels of statewide fire protection services. These levels of service recognize other fire protection resources at the federal and local level that collectively provide a regional and statewide emergency response capability. In addition, California's integrated mutual aid fire protection system provides fire protection services through automatic and mutual aid agreements for fire incidents across all ownerships. The California Fire Plan is the state's road map for reducing the risk of wildfire through planning and prevention to reduce firefighting costs and property losses, increase firefighter safety, and to contribute to ecosystem health.

The Board has adopted these Strategic Fire Plans for California since the 1930s and periodically updates them to reflect current and anticipated needs of California's wildland. The Strategic Fire Plan is the state's road map for reducing the risk of wildfire through planning and prevention to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health. The Strategic Fire Plan is adopted to better respond to the changes of the environmental, social, and economic landscape of California's wildlands and to provide CAL FIRE with appropriate guidance for adequate statewide fire protection of state responsibility areas. The latest Strategic Fire Plan is dated August 22, 2018.

CAL FIRE implements and enforces the Board's policies and regulations. The 2018 Strategic Fire Plan reflects CAL FIRE's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and (2) natural resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation.

State Fire Regulations

Fire regulations for California are established in Sections 13000 et seq. of the California Health and Safety Code and include regulations for structural standards (similar to those identified in the California Building Code), fire protection and public notification systems, fire protection devices such as extinguishers and smoke alarms, standards for high-rise structures and childcare facilities, and fire suppression training. The State Fire Marshal is responsible for enforcement of these established regulations and building standards for all state-owned buildings, state-occupied buildings, and state institutions within California.

Emergency Response California Emergency Services Act

The California Emergency Services Act was adopted to establish the state's roles and responsibilities during human-caused or natural emergencies that result in conditions of disaster and/or extreme peril to life, property, or resources of the state. This act is intended to protect health and safety by preserving the lives and property of the people of the state.

California Natural Disaster Assistance Act

The California Natural Disaster Assistance Act provides financial aid to local agencies to assist in the permanent restoration of public real property, other than facilities used solely for recreational purposes, when such real property has been damaged or destroyed by a natural disaster. The California Natural Disaster Assistance Act is activated after a local declaration of emergency and the California Emergency Management

Agency gives concurrence with the local declaration, or the governor issues a proclamation of a state emergency. Once the act is activated, local government is eligible for certain types of assistance, depending on the specific declaration or proclamation issued.

4.12.2.3 Local

CAL FIRE San Mateo – Santa Cruz Unit Strategic Fire Plan

CAL FIRE requires counties to develop fire protection management plans that address potential threats of wildland fires. The CAL FIRE San Mateo – Santa Cruz Unit (CZU), which is the County Fire Department for both San Mateo County and Santa Cruz County, adopted the 2019 Strategic Fire Plan for the San Mateo County and Santa Cruz County unit in May 2019. The plan is a planning and assessment tool that identifies and prioritizes pre-fire and post-fire management strategies and tactics meant to reduce the loss of values at risk within the Unit.

County of Santa Cruz Local Hazard Mitigation Plan

The County Local Hazard Mitigation Plan also designates critical hazard areas of the county as areas subject to greater threat from wildfire, and identifies these areas based on slope, vegetation, ability to respond to fire threats, and localized weather conditions in order to assist with preparation of County hazard mitigation and response planning. Its purpose is to identify and characterize hazards, and to identify and prioritize the mitigation activities. The plan was last updated in September 2015.

Santa Cruz – San Mateo Community Wildfire Protection Plan

Community Wildfire Protection Plans (CWPPs) are authorized and defined in Title 1 of the Healthy Forests Restoration Act (HRFA) of 2003. The Santa Cruz County San Mateo County Community Wildfire Protection Plan (CWPP) identifies the risks and hazards associated with wildland fires in the WUI areas of San Mateo and Santa Cruz counties. The plan also identifies recommendations aimed at preventing and reducing both infrastructure and ecosystem damage associated with wildland fires. The plan documents suggested actions intended to reduce the risk to people, property and the environment. Fuel reduction projects identified in an approved CWPP receive priority for federal funds.

4.12.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to hazards and hazardous materials. The section identifies the thresholds of significance used in evaluating the impacts, describes the methods used in conducting the analysis, and evaluates the Proposed Project's impacts and contribution to significant cumulative impacts, if any are identified. Mitigation measures are presented for identified significant or potentially significant impacts, and the level of significance with mitigation also is identified.

4.12.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to hazards and hazardous materials are based on Appendix G of the CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

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.

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 or ongoing impacts to the environment.

D. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

4.12.3.2 Analytical Methods

This impact analysis based on review of existing fire hazard maps and review of the Proposed Project components.

Application of Relevant Standard Construction Practices

The City has adopted standard construction practices (see Section 3.6.6, Standard Construction Practices) that would be implemented by the City or its contractors during construction to avoid or minimize effects of wildfire. These practices and their effectiveness in avoiding and minimizing effects are described below.

Related to fire prevention, the Proposed Project includes Standard Construction Practice #16, which regulates construction equipment engines to prevent sparks, requires fire suppression equipment, and restricts construction activities during red flag warnings issued by CALFIRE.

Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur even with consideration of applicable policies and regulations and Proposed Project Standard Construction Practices described in Chapter 3, Project Description, if applicable, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less-than-significant levels.

4.12.3.3 Project Impact Analysis

Impact WIL-1: Wildfire Hazards (Significance Thresholds A, B, C, and D). The Proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. ***(Less than Significant)***

As discussed in Section 4.12.1, the proposed pipeline alignment is within a moderate to high fire hazard severity zone (see Figure 4.12-1). Most of the northern segment of the proposed pipeline is within a moderate fire hazard severity zone, whereas much of the Graham Hill Road North section of the southern segment is within a high fire hazard severity zone. Although most of the Proposed Project alignment is within an SRA, the southern portion of Graham Hill Road forms a boundary between a SRA on the west side of the road and a LRA, Unincorporated, on the east side of the road. Both sides of the road in this area are classified as moderate fire hazard severity zones.

Construction and operation of the Proposed Project would not include construction of habitable structures that could expose people or structures to wildfire. The Proposed Project consists of installation of an underground pipeline. Project construction could include the use of welding equipment, torching, generators, chainsaws, and chippers, all of which could produce sparks and potentially put nearby residences and wildland area at risk of fire. However, with implementation of the Proposed Project Standard Construction Practices, as described above and in Section 3.6.6, Standard Construction Practices, fire safety measures for operating equipment would be implemented during construction. Spark arrestors would be required for internal combustion engine equipment, fire suppression equipment would be required on site during use of such mechanical equipment, and construction activities would not be conducted during high fire hazard periods (i.e., red flag warnings)[1] unless adequate fire protection measures are implemented in compliance with federal, state, and local fire prevention and protection regulations and guidance. Fire safety measures will be detailed in a Fire Safety Program for the project. Fire suppression equipment at the construction sites would include items such as fire extinguishers and shovels. Therefore, the Proposed Project would not result in conditions that would expose people or structures to significant risk of loss, injury or death involving wildland fires or exacerbate wildfire risks. The Proposed Project would not expose people to pollutant concentrations from a wildfire as the Proposed Project would not generate new homes or occupants.

Upon completion of construction, the underground pipeline would be buried and disturbed areas would be repaved and/or revegetated. Therefore, the Project would not exacerbate wildfire risks or expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. Furthermore, the Proposed Project does not involve grading or construction that would increase risks of downslope or downstream flooding or landslides that could lead to post-fire slope instability. Upon completion of construction, the Project would consist of an underground pipeline. The Project does not require the installation or maintenance of infrastructure to support the proposed replacement of an existing raw water line, such as roads, fuel breaks, emergency water sources, or power lines that would exacerbate fire risk. For these reasons, impacts would be *less than significant*.

[1] Red flag warnings and fire weather watches are issued by CAL FIRE based on weather patterns (low humidity, strong winds, dry fuels, etc.) and listed on their website (https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/).

4.12.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative wildfire impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-1 in Section 4.0, Introduction to Analyses, and as relevant to this topic. The geographic area for the analysis of cumulative impacts is described below.

The geographic area for the analysis of cumulative impacts related to wildfire consists of the proposed pipeline alignment and areas in proximity to the alignment because impacts related to such hazards depend on the specific conditions on the particular project site and its immediate vicinity. Generally, these site-specific impacts would not combine with one another to create cumulative impacts, unless the cumulative development sites overlapped or were immediately adjacent to one another. The known cumulative projects planned within the geographic area of analysis for cumulative impacts related to wildfire include: the Newell Creek Dam Inlet/Outlet Replacement Project; the Graham Hill Water Treatment Plant (GHWTP) Concrete Tanks Project; the GHWTP Facility Improvement Project; and several County bridge replacement projects (see Table 4.0-1 in Section 4.0, Introduction to Analyses).

Impact WIL-2: Cumulative Wildfire Impacts (Significance Thresholds A-D). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to significant risk of loss, injury, or death involving wildland fires. ***(Less than Significant)***

The only cumulative projects with an overlap of construction schedules are two improvement projects at the GHWTP (Concrete Tanks Project and Facility Improvement Project). Other cumulative projects using roads within the Proposed Project construction areas would be completed before Proposed Project construction begins (Newell Creek Dam Inlet/Outlet Improvement Project and San Lorenzo Way Bridge Replacement) or would occur after completion of the Graham Hill Road pipe sections (intertie pipeline with Scotts Valley, for which no project timeline has been established). Upon completion of the Proposed Project, the new underground NCP would not result in operational hazards or expose people or structures to significant cumulative wildfire risks.

As described in Impact WIL-1, construction for the Proposed Project could include the use of welding equipment, torching, generators, chainsaws, and chippers, all of which could produce sparks. Similar construction techniques would be used during cumulative project construction at the GHWTP because these projects are under City jurisdiction and would be expected to implement similar Standard Construction Practices. The City's Standard Construction Practices, as described in Section 3.6.6, Standard Construction Practices, include fire safety measures that would be implemented during construction at each of the cumulative project sites, specifically during use of such equipment (Standard Construction Practice #16) as is included in the Proposed Project. Fire suppression equipment would include items such as fire extinguishers and shovels. Therefore, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to related to significant risk of loss, injury, or death involving wildland fires or indirect exacerbation of wildland fire hazard or post-fire erosion or landslides. As a result, cumulative impacts would be less than significant.

4.12.4 References

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5 Other CEQA Considerations

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. The environmental impact report (EIR) must discuss (1) significant environmental effects of the proposed project and mitigation measures proposed to minimize the significant effects, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, (4) growth-inducing impacts of the proposed project, and (5) alternatives to the proposed project.

This chapter summarizes the significant environmental effects that cannot be avoided if the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project) is implemented (i.e., significant unavoidable impacts). It also addresses growth inducement and whether significant irreversible environmental changes of the Proposed Project are required to be evaluated. An evaluation of the significant environmental effects of the Proposed Project, applicable mitigation measures, the level of impact significance before and after mitigation, and evaluation of cumulative impacts, is provided in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, and impacts and mitigation measures are summarized in Chapter 1, Summary. Chapter 6, Alternatives, addresses alternatives to the Proposed Project.

5.1 Significant Unavoidable Impacts

The CEQA Guidelines require a description of any significant impacts, including those that can be mitigated but not reduced to a level of insignificance (Section 15126.2[c]). Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described. This EIR identified one significant unavoidable impact associated with construction noise impacts from the limited nighttime pipeline pullback activities required at the Brackney North pipe section (see Impact NOI-2 in Section 4.10, Noise and Vibration).

5.2 Significant Irreversible Environmental Changes

The CEQA Guidelines require a discussion of significant irreversible environmental changes with project implementation, including uses of nonrenewable resources during the initial and continued phases of the project (Section 15126.2[d]). However, CEQA Guidelines Section 15127 indicates that information concerning irreversible changes needs to be included only in EIRs prepared in connection with:

(a) The adoption, amendment, or enactment of a plan, policy, or ordinance of a public agency;

(b) The adoption by a Local Agency Formation Commission of a resolution making determinations; or

(c) A project which will be subject to the requirement for preparing an environmental impact statement pursuant to the requirements of the National Environmental Policy Act of 1969, 42 United States Code Sections 4321–4347.

As the Proposed Project is not one of the above project types, this EIR is not required to include an analysis of significant irreversible environmental changes.

5.3 Growth Inducement

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. This discussion should include consideration of ways in which the project could directly or indirectly foster economic or population growth in adjacent and/or surrounding areas. Projects that could remove obstacles to population growth (such as major public service expansion) must also be considered in this discussion. According to CEQA, it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

According to the CEQA Guidelines, a project would have the potential to induce growth if it would:

- Remove obstacles to population growth (e.g., through the expansion of public services into an area that does not currently receive these services), or through the provision of new access to an area, or a change in restrictive zoning or land use designation; or

- Result in economic expansion and population growth through employment opportunities and/or construction of new housing.

As discussed in Section 4.1.5 of this EIR, the project would not include construction of new housing or generate new employment opportunities. The project would consist of replacement of existing infrastructure and associated minor appurtenances associated with the NCP, which conveys raw water between Loch Lomond Reservoir and the City's Graham Hill Water Treatment Plant. The proposed 24-inch diameter pipeline is the same size as the majority of the existing pipeline, and thus, the Proposed Project would not change capacity of the existing NCP. The Proposed Project would not involve procurement of additional water supplies or expansion of public services into areas that do not currently receive these services. Thus, the Project would not remove obstacles to population growth. As an improvement to a water supply transmission facility, the Proposed Project would not result in uses that would directly or indirectly induce substantial economic growth.

It is noted that the Santa Cruz Water Department is in the process of implementing a Capital Improvement Program (CIP), also known as the Santa Cruz Water Project, which includes plans and funding for numerous capital improvements projects, including rehabilitation or replacement projects, upgrades and improvements projects, water supply reliability studies, and water main replacements as discussed in Section 4.0.4.2. The City has submitted applications for changes to its existing water rights that would change the manner of diversion and location of use and also has embarked on a pilot water-sharing agreement with Soquel Creek Water District. These future projects could result in a change and/or increase in inflows to and seasonal withdrawals from Loch Lomond Reservoir. However, the Proposed Project is independent of these other planned projects and would not result in population growth inducement.

6 Alternatives

6.1 Introduction

This chapter describes alternatives to the proposed Newell Creek Pipeline (NCP) Improvement Project (Proposed Project), consistent with California Environmental Quality Act (CEQA) Guidelines Section 15126.6. This chapter presents the objectives of the Proposed Project, a summary of its significant environmental impacts, and a description of the alternatives that were considered but eliminated from further consideration, followed by an analysis of the three alternatives evaluated, including the No Project Alternative. A comparison of the alternatives to the Proposed Project is provided and the environmentally superior alternative is identified.

According to CEQA Guidelines Section 15126.6, an environmental impact report (EIR) shall describe a range of reasonable alternatives to the project or to the location of the project, that would feasibly attain most of the basic objectives of the project and could avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. This section of the guidelines further requires that the discussion focus on alternatives capable of eliminating significant adverse impacts of the project or reducing them to a level of insignificance even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly. The alternatives analysis also should identify any significant effects that may result from a given alternative.

For alternative project site locations and in accordance with CEQA Guidelines Section 15126.6(f)(2), the key question and first step in analysis of alternative site locations is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR.

The lead agency is responsible for selecting a reasonable range of potentially feasible project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives is governed by a "rule of reason" that requires the EIR to set forth only those potentially feasible alternatives necessary to permit a reasoned choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only those that the lead agency determines could feasibly attain most of the basic objectives of the project while substantially lessening any of the significant effects of the project. An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

An EIR is not required to consider alternatives which are infeasible. "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines Section 15364). Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context),

and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or already owns the alternative site). None of these factors establishes a fixed limit on the scope of reasonable alternatives. Under CEQA case law, the concept of feasibility also "encompasses 'desirability' to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors." (*City of Del Mar v. City of San Diego* [1982] 133 Cal.App.3d 410, 417; *California Native Plant Society v. City of Santa Cruz* [2009] 177 Cal.App.4th 957.) In assessing the feasibility of alternatives, agency decisionmakers may also take account of the extent to which the alternatives meet or further the agency's underlying purpose or objectives in considering a proposed project. (*Sierra Club v. County of Napa* [2004] 121 Cal.App.4th 1490, 1506-1509; *Citizens for Open Government v. City of Lodi* [2012] 296 Cal.App.4th 296, 314-315; *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* [2008] 43 Cal.4th 1143, 1165, 1166.)

6.2 Summary of Project Objectives and Significant Project Impacts

6.2.1 Summary of Project Objectives

As indicated in Chapter 3, Project Description, Section 15124 of the CEQA Guidelines indicates that the EIR project description shall include a statement of the objectives sought by the Proposed Project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR. In conducting the alternatives analysis, consideration must be given as to how, and to what extent, an alternative can meet the project's basic objectives. The objectives for the Project are as follows:

1. Address identified deficiencies in the NCP conditions in order to maintain full system functioning without interruption, in order to protect water supply reliability and service to the City's customers.

2. Improve long-term reliability of the City's water supply infrastructure between Loch Lomond Reservoir and the Graham Hill Water Treatment Plant (GHWTP) such that it can continue to function as an integral part of the City's overall water supply system.

3. Improve access to the NCP to facilitate inspection, maintenance, and repair of the pipeline system, while minimizing the potential for environmental and propety damage impacts (such as may occur in State Parks and other sensitive areas).

4. Site the NCP to consider constructability, optimize accessibility for maintenance, minimize the potential for future failures due to unstable terrain, and avoid risks (e.g., public safety, property damage) and impacts to adjacent uses associated with pipeline failures during the life of the pipeline.

5. Implement NCP project segments that are cost-effective in terms of both capital and operation/maintenance costs.

6.2.2 Significant Project Impacts

The following potentially significant impacts have been identified, all of which can be mitigated to a less-than-significant level, except for NOI-2, noise increases in the Brackney North and potentially Brackney South sections.

- **BIO-1A: Special-Status Plant Species.** The Proposed Project could have a substantial adverse effect on special-status plant species during construction.

- **BIO-1B: Special-Status Wildlife Species.** The Proposed Project could have a substantial adverse effect on special-status wildlife species during construction.

- **BIO-2: Sensitive Vegetation Communities.** The Proposed Project could have a substantial adverse effect on sensitive vegetation communities and habitats during construction that would result in both temporary and permanent impacts.

- **BIO-3: Jurisdictional Wetlands and Waters.** The Proposed Project would not have a substantial adverse effect on jurisdictional wetlands, but could have a substantial adverse effect on jurisdictional non-wetland waters during construction that would result in both temporary and permanent impacts.

- **GEO2: Unstable Geologic Unit or Soils.** The Proposed Project could potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse.

- **GEO4: Paleontological Resources.** The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. However, the Proposed Project would not directly or indirectly destroy a unique geological feature.

- **HAZ-4: Hazardous Materials Sites.** The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment.

- **HYD-1: Surface Water Quality Standards and Waste Discharge Requirements.** Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except for potential inadvertent release of drilling fluids in the Brackney North pipe section . In addition, the Proposed Project would not conflict with or obstruct implementation of a water quality control plan related to surface water.

- **NOI-2: Substantial Increase in Ambient Noise Levels in Excess of Standards.** Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established in local general plans or noise ordinances.

6.3 Alternatives Considered but Eliminated

The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR also should identify any alternatives that were considered by the lead agency but were rejected, and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are:

(1) failure to meet most of the basic project objectives,

(2) infeasibility, or

(3) inability to avoid significant environmental impacts.

The City of Santa Cruz Water Department (City) considered the following Project alternatives, which were eliminated from further consideration as explained in the following sections:

- Rehabilitation of the Existing Newell Creek Pipeline (NCP)
- Replace Existing Pipeline in Existing Location in Place
- Alternative Alignment Locations
    - Northern Segment: Highway 9, High School Trail (west of Highway 9) and Hihn Road sections
    - Southern Segment: Existing alignment, Railroad right-of-way (ROW) (west of existing NCP) sections

The City also considered a "Do Nothing" scenario that would leave the pipeline in place in its existing condition without modifications or repair. However, this alternative was eliminated from consideration as it does not solve the primary goal of the project which is to improve potable water reliability to the City. Due to the age of the infrastructure and its condition, the existing NCP must be repaired or replaced to meet the project goals (HDR 2019b). Additionally, identified project impacts relate to the construction of the Proposed Project, and ongoing operations and maintenance would not result in significant impacts. Therefore, alternatives related to reduced pipe size and changes in pipe capacity were not considered.

6.3.1 Rehabilitation of Existing Pipeline

This option consists of rehabilitation and repairs to the existing NCP sections using in-situ methods such as cured-in-place piping (CIPP). This would involve insertion of a new pipe within the existing pipe, which would reduce the overall interior pipe diameter.

The City reviewed sections of the NCP and assessed potential rehabilitation of existing pipeline sections (HDR 2019b). The review concluded that rehabilitation of the pipeline in its current location was not possible along the Pipeline Road section in Henry Cowell Redwoods State Park as it would not meet the basic Project goals regarding long-term reliability of the City's water supply system due to continued risks of pipeline breaks and access constraints for rehabilitation and ongoing maintenance. Rehabilitation would also reduce the interior pipeline size that could affect pumping capacities. As a result, the Rehabilitation alternative was eliminated from further analysis.

6.3.2 Replacement of Existing Pipeline in Place

Replacement of the pipe within the existing alignment was considered and could be achieved using one of the following methods:

1. Excavation and removal of the existing pipe and installation of the pipeline in the same location. This may require installation of a temporary bypass line to maintain water supply to the GHWTP.

2. Utilization of pipe bursting technique on the existing NCP to install a new pipeline in the current alignment.

The City reviewed sections of the NCP and assessed potential rehabilitation of existing pipeline sections (HDR 2019b). The review concluded that replacement of the pipeline in its current location was not possible along the Pipeline Road section in Henry Cowell Redwoods State Park as it would not meet the basic Project goals regarding long-term reliability of the City's water supply system. In addition, this alternative would require construction of a temporary bypass water line in order to maintain service during construction. As a result, the Replacement alternative was eliminated from further analysis.

6.3.3 Alternative Alignment Locations

6.3.3.1 Northern Segment

Highway 9

The Highway 9 alternative pipe section extends approximately 4.4 miles from Glen Arbor Road to the Felton Booster Pump Station (FBPS). The pipeline would tie into the existing Glen Arbor Road section and continue along Glen Arbor Road to Highway 9, crossing the San Lorenzo River at Glen Arbor Road. The alignment would then follow Highway 9 for approximately 1.8 miles to Graham Hill Road, where the alignment turns east to follow Graham Hill Road back across the San Lorenzo River and to the FBPS shown on Figure 6-1A.

The Highway 9 alignment would entirely replace the existing Brackney North, Brackney South, San Lorenzo Way, and Felton Booster Pump Station pipeline sections. The Newell Creek Road and Glen Arbor Road sections would remain the same as the Proposed Project. This alignment would include five new river or creek crossings: four crossings of the San Lorenzo River and one crossing of Fall Creek. This alignment has a maximum elevation of approximately 390 feet above mean sea level (amsl), therefore water would flow by gravity and would not require a new pump station (HDR 2019a).

Installation of the pipeline in Highway 9 would require obtaining approval and easement from Caltrans that may not be successful given Caltrans requirements for construction in state ROWs. Due to the likelihood that an encroachment permit may not be successfully obtained, this alternative was not deemed feasible since the City may not be able to reasonably acquire, control, or otherwise have access to this alternative pipeline alignment. Therefore, due to potential infeasibility of obtaining easements from Caltrans in addition to five new creek crossings, this alternative alignment was eliminated from further consideration.

High School Trail

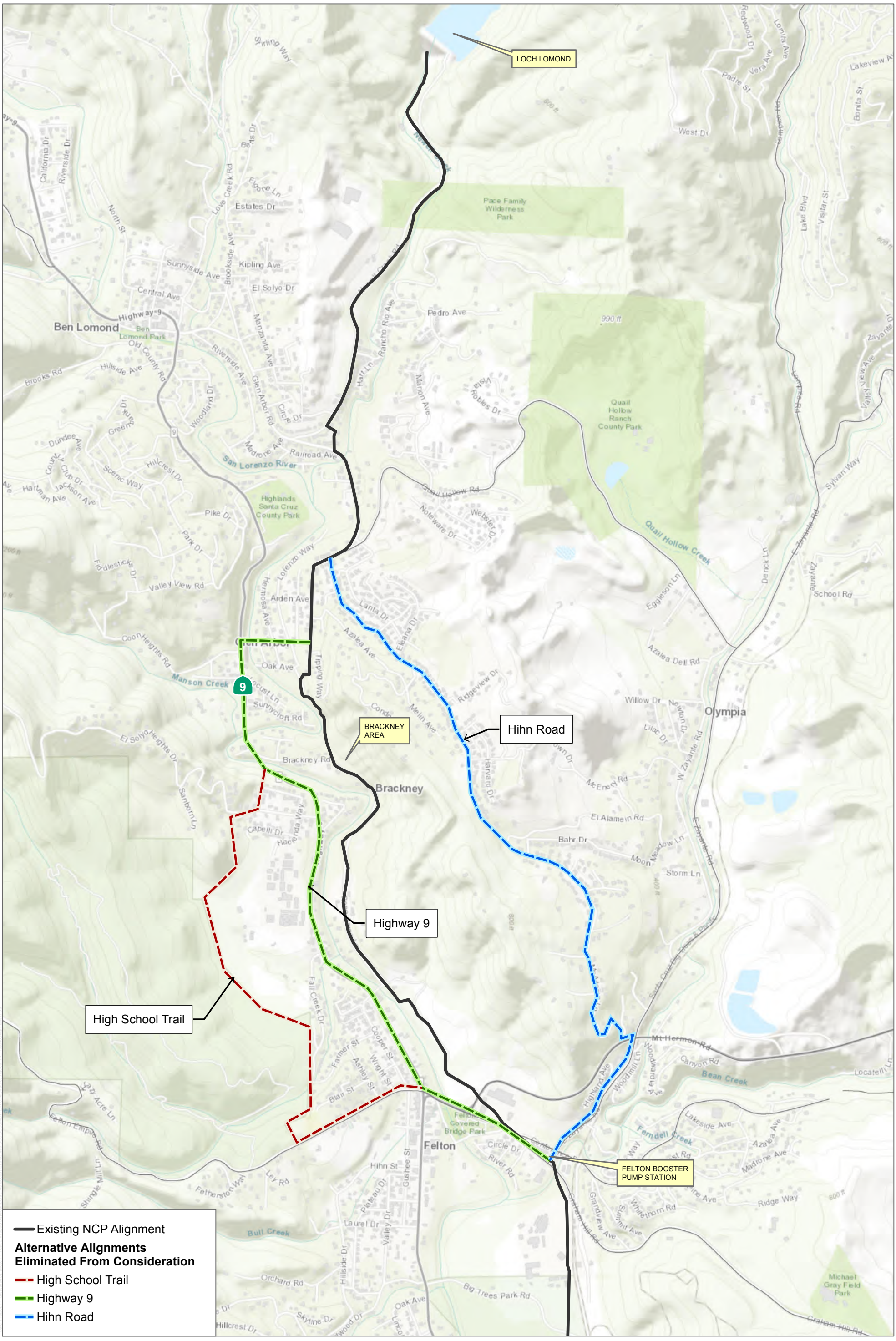
Like the Highway 9 alignment alternative, the High School Trail alignment would tie into the existing Glen Arbor Road section and continue to Highway 9, crossing the San Lorenzo River at Glen Arbor Road (see Figure 6-1A). The alignment would follow Highway 9 south for approximately 0.5 miles, with two more crossings of the San Lorenzo River before diverting southwest along Hillview Drive, then to the west of San Lorenzo Valley Middle, Elementary, and High Schools along High School Trail. The alignment follows the trail with two creek crossings before reaching Felton Empire Road, then follows Felton Empire Road east to Graham Hill Road, crossing the San Lorenzo River a fourth time before continuing on to the FBPS. The High School Trail alignment would entirely replace the existing Brackney, San Lorenzo Way, and Felton Booster Pump Station pipe sections (HDR 2019a).

There is no road access to the area behind the existing schools, however there are walking trails. This alignment includes four crossings of the San Lorenzo River. Aligning the pipeline with Highway 9 even for this short length will require obtaining approval and easement from Caltrans, which may not be feasible for the reasons explained above. The construction behind the schools presents access issues for construction and maintenance and includes additional coordination and approvals with the San Lorenzo Valley Unified School District. The pipeline would be constructed at the base of the adjacent hill behind the schools. The stability of the hillside is unknown and given the City's recent experience with geotechnical issues within the existing NCP alignment, the risk is not considered acceptable. The southern portion of this section is within Henry Cowell State Park, and approvals from California State Parks would be required. In addition to permits and coordination required for construction within the State Park, the alignment presents additional concerns related to potential environmental impacts (due to pipeline failures, leaks, and slope instability) as currently exist along Pipeline Road. As a result, this alternative alignment was not found to be feasible due to unsuitable site conditions and the potential inability of the City to obtain permits and thus have access to the site (HDR 2019a). Therefore, for these reasons and the additional creek crossings, this alternative alignment was eliminated from further consideration.

Hihn Road

The Hihn Road alignment would follow Hihn Road south from Glen Arbor Road to McAdams Lane. The pipeline would then run along McAdams Lane and Covenant Lane to Mount Hermon Road. The alignment would then follow Mount Hermon Road west to FBPS for a total distance of approximately 4.5 miles as shown on Figure 6-1A. The Hihn Road alignment would entirely replace Brackney, San Lorenzo Way, and Felton Booster Pump Station pipe sections and part of the existing Glen Arbor Road section. Road access is uncertain in sections of this alignment. This alignment has a maximum elevation of approximately 685 feet amsl, which would require an additional pump station due to the elevation gain required. This alignment would require two creek crossings (HDR 2019a).

Hihn Road terminates into private property to the south. The pipeline would require trenching across approximately 0.5 mile of private property to connect to East Zayante Road or be constructed with trenchless construction methods. Hihn Road has a shoulder width of approximately 2-4 feet beyond the white line on each side of the road. Limited roadway shoulder and presence of structures and retaining walls would make access difficult. As a result, this alternative alignment was not found to be feasible due to unsuitable site conditions and the potential inability of the City to obtain easements across private property, and thus, not have access to the site.



SOURCE: ESRI 2020, County of Santa Cruz 2020, City of Santa Cruz 2020

DUDEK

0 750 1,500 Feet

FIGURE 6-1A

Alternative Alignments Eliminated from Further Consideration, Northern Segment

Newell Creek Pipeline Improvement Project

Additionally, the entire area is mapped as potential sensitive Sandhills habitat according to County of Santa Cruz GIS mapping (County of Santa Cruz 2021). Installation of the pipeline along Hihn Road could result in impacts to special status species and sensitive habitat during construction similar to the Proposed Project. In accordance with CEQA Guidelines Section 15126.6(f)(2), only alternative locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. Because potentially significant biological resource impacts would not be avoided or substantially lessened as well as potential infeasibility of obtaining easements and access, this alternative was eliminated from further consideration.

6.3.3.2 Southern Segment

Existing Alignment

The southern segment of the existing NCP alignment consists of four existing sections spanning a distance of approximately 4.8 miles with a maximum elevation of 568 feet amsl as shown on Figure 6-1B. Installation of a new pipe in the existing pipeline alignment would require three creek crossings. A significant portion of the northernmost section is currently private property owned by the San Lorenzo Lumber Yard.

In addition, the pipeline has been exposed in several areas along the pipeline section due to slides and washout. The existing pipeline road alignment transverses numerous unstable and extreme slopes with a long history of failures that have threatened or compromised the integrity of the pipeline. While some slides were repaired with soldier pile walls, the roads and soldier walls are experiencing further damage which would require additional engineering controls to stabilize the area if this route were used for the new pipeline alignments.

The Pipeline Road section has the highest recent break history primarily associated with corrosion, land movement, and clogged or undersized culverts resulting in significant washout exposing the pipeline and limiting access to make repairs. The entire Pipeline Road section is within Henry Cowell Redwoods State Park and follows Pipeline Road, a mostly paved road within the park that doubles as a hiking trail. The paved road is only accessible to State Park and City vehicles. The Pipeline Road section is connected to the Henry Cowell State Park section to the north and the Graham Hill Road section on the south. The remote terrain along both of these sections creates difficulty for City operations to access the alignment for operations and maintenance which is a high priority goal of the City for future reliability of the system. Furthermore, the narrow corridor also presents problems for access for construction equipment. In order to make this alignment a reliable and accessible route for a new pipeline, significant improvements to the existing road would be required to allow installation of a new drainage system to reduce erosion damage to the pipeline that has been experienced in the past (HDR 2019a). Retaining walls would also be needed to stabilize many of the active slopes threatening the existing road and pipeline. As a result, this alternative alignment was not found to be feasible due to unsuitable site conditions and was eliminated from further consideration.

Railroad ROW

The Railroad section would follow existing San Lorenzo Lumber Yard pipe section from the FBPS, and then continue following the Santa Cruz Big Trees & Pacific Railroad south to Vernon Street in the city of Santa Cruz where it would turn east for about 500 feet and tie into the existing Coast Pump Station that pumps to the GHWTP. The Railroad alignment would entirely replace all of the existing pipeline sections in the

Southern Segment of the Proposed Project, including Henry Cowell State Park and Pipeline Road sections, but does not entirely bypass the state park property.

Site suitability is constrained because construction would be difficult due to very limited space for a pipeline along the alignment, and the pipeline would be constructed in a highly active geologic area, requiring numerous retaining walls as well as trestle crossings. Future access for maintenance and operations also would be difficult. This alternative would require coordination and authorization from the Santa Cruz Big Trees & Pacific Railroad, California State Parks, and Caltrans and will include two crossings of the San Lorenzo River and two crossings of Highway 9. This alternative alignment would also reduce the City's supply reliability by causing all source water for the GHWTP to flow through the 24-inch raw water transmission main between the Coast Pump Station and the GHWTP. Since the Coast Pump Station is subject to flooding, the City has benefited from having redundancy in the raw water supply by having an entirely independent source to supply the GHWTP (HDR 2019a).

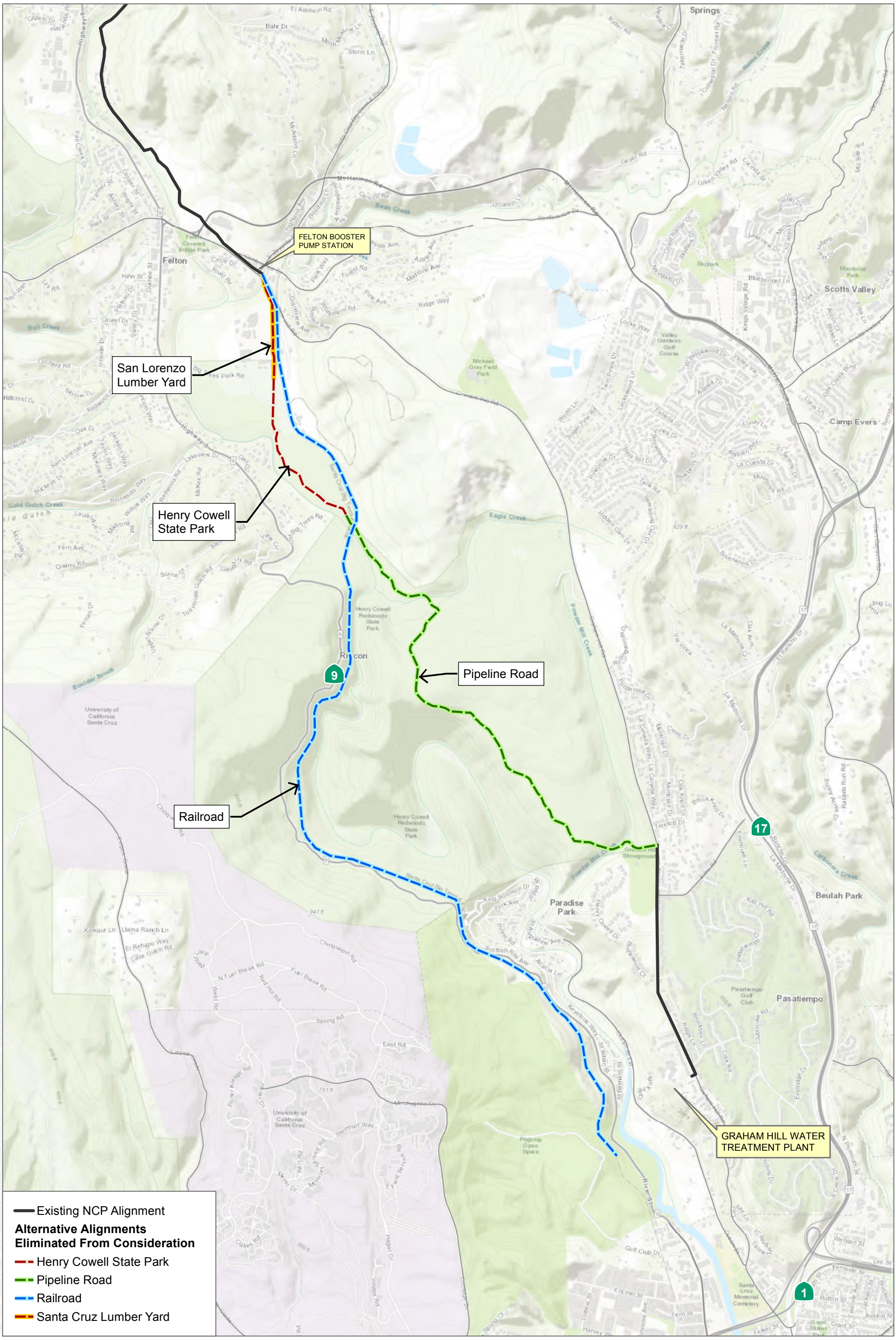
Thus, this alternative was not found to be feasible due to constrained site suitability and lack of access control. In addition, it was found to not meet the basic Project objective to improve long-term reliability of the City's water supply infrastructure. Therefore, this alternative was eliminated from further consideration.

6.3.4 Brackney North Pipe Section Alternative Construction Methods

An alternatives analysis was completed (Mott MacDonald 2021a) to evaluate and determine the preferred construction method in the Brackney North section. The analysis was based on available data, including field mapping, a geophysical survey, topographic survey, completion of five geotechnical borings, and potholing to determine the depth of the existing pipeline. The alternatives analysis included the following construction methods:

- Tunnel (including microtunnel, conventional bored tunnel, and conventionally mined tunnel)
- HDD
- Deep open cut into rock
- Shallow open cut with pipe supports anchored to bedrock
- Shallow open cut with a flexible pipeline (i.e., earthquake resistant ductile iron pipe)
- Auger bore

The deep and shallow open cut methods were considered but determined to be infeasible due to issues with constructability. Although these are traditional installation methods, several factors limit feasibility of constructability. First, it is not feasible to construct the new pipeline within the City's existing 10-foot easement while maintaining the existing pipeline in service, thus requiring the City to acquire additional easement(s). Even with an additional easement, the existing Brackney North site is constrained by limited size and steeply sloping terrain on both the upslope and downslope sides of the existing easement that limit vehicle and equipment access. In many cases, there may not be sufficient available space to allow these pieces of equipment to work together, a longer construction timeline may be required, or additional space may be required. For the shallow open cut construction methods, additional methods may be required, such as cantilevered retaining walls, to stabilize slopes and provide a safe trench for installation (Mott MacDonald 2021).



SOURCE: ESRI 2020, County of Santa Cruz 2020, City of Santa Cruz 2020

DUDEK

0 950 1,900 Feet

FIGURE 6-1B

Alternative Alignments Eliminated from Further Consideration, Southern Segment

Newell Creek Pipeline Improvement Project

Trenching within the easement and adjacent to the unstable slopes would require extreme care and, likely, additional methods, such as a continuous cantilevered retaining wall to the west and a tieback wall to the east, to stabilize slopes and provide a safe trench for installation. Slope and trench stability are significant concerns during construction. If there is destabilization of soils surrounding the existing pipeline, the pipeline could shift, causing damage during construction. This could occur if unstable soil conditions resulted in landslide conditions or if soils experience movement during trenching, trench stabilization, or backfilling operations. The deep open cuts will need to account for risks of undercutting soil and rock debris from previous landslides as well as generating new slope instabilities or triggering a landslide during construction. There is also a long-term risk of damage to the pipeline from future landslides, earthquakes, and erosion. The project would likely need to stabilize the slope under permanent long-term scenarios to reduce future risk exposure to the City. Furthermore, construction would be immediately upslope of the San Lorenzo River, which would require implementation and maintenance of extensive erosion and sediment control measures to avoid depositing sediment into the river, which is a drinking water source (Mott MacDonald 2021).

Therefore, due to the significant risks during construction, potentially significant impacts related to geologic hazards, erosion, and water quality, and feasibility of acquiring additional easements to provide adequate construction areas, deep and open cut construction methods in the Brackney North area were eliminated from further consideration.

The City's engineering team also considered several trenchless methods: HDD, microtunneling, and auger bore construction. The auger bore method, sometimes referred to as "horizontal auger bore" or "jack and bore" was considered a potentially suitable method to install the pipeline within a casing into bedrock below potential landslide hazard zones. This option would install the pipeline within a temporary casing, approximately 48 inches in diameter with three temporary shafts required to construct the pipeline. The auger bore installation would be constructed with two approximately 350-foot-long straight drives. The casing would be installed approximately 35 ft below the ground surface, into stable bedrock. Each shaft location would require a level platform, potentially 30 ft wide. This would require widening of the existing dirt road at the shafts likely using cantilevered pile shoring or a similar method (Mott MacDonald 2021).

However, there are significant geotechnical risks to successful installation (Mott MacDonald 2021). The presence of fractured water bearing rock and the Ben Lomond Fault pose significant risks to a successful installation; adverse impacts could occur, such as flooding of the casing and shaft and loose rock jamming the cutting head. One area of significant risk is the Ben Lomond Fault which may act as a conduit for groundwater and may generally be surrounded by more fractured rock, and the receiving shaft would be located on or very close to the fault. Pre-excavation or dewatering the rock with wells constructed from the ground surface could be utilized but would require a specialized contractor. The auger bore method would significantly reduce the long-term risk of damage to the pipeline from landslides and erosion. However, due to site topography and the required lengths of installation, the auger bore method may not be able to completely avoid the landslide hazard area that exists in the area. For example, the northern shaft would be located within an area previously mapped as a landslide area, and it is not possible to continue while curving the auger bore past this area.

Therefore, due to the significant risks during construction and feasibility of construction, the auger bore construction method in the Brackney North area was eliminated from further consideration. The HDD method was selected as the preferred alternative and is included in the Proposed Project evaluated in this EIR. The microtunneling method is discussed as an alternative in Section 6.4.3, Brackney North Alternative Construction Methods.

6.4 Alternatives Selected for Analysis in EIR

This section describes the alternatives to the Proposed Project that were selected and analyzed according to CEQA Guidelines Section 15126.6(a) after elimination of some considered alternatives as explained in Section 6.3, Alternatives Considered but Eliminated. The analyzed alternatives, including the No Project Alternative, represent a reasonable range of alternatives to the Proposed Project that would feasibly attain most of the Proposed Project's basic objectives, and would avoid or substantially lessen the significant adverse environmental effects of the Proposed Project. The Proposed Project's objectives are listed in Section 6.2. Significant Project Impacts are summarized in Section 6.2 and described in detail in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures.

The following three alternatives were selected for comparative analysis in this EIR:

- **No Project Alternative –** The No Project Alternative is required by CEQA and consists of the circumstances under which the Proposed Project does not proceed
- **Alternative 1A –** Alternative Pipe Alignment: Quail Hollow Road in the northern segment as shown on Figure 6-2
- **Alternative 1B –** Alternative Pipe Alignment: Mount Hermon Road in the southern segment as shown on Figure 6-2
- **Alternative 2 –** Brackney North Pipe Section Alternative Construction Methods

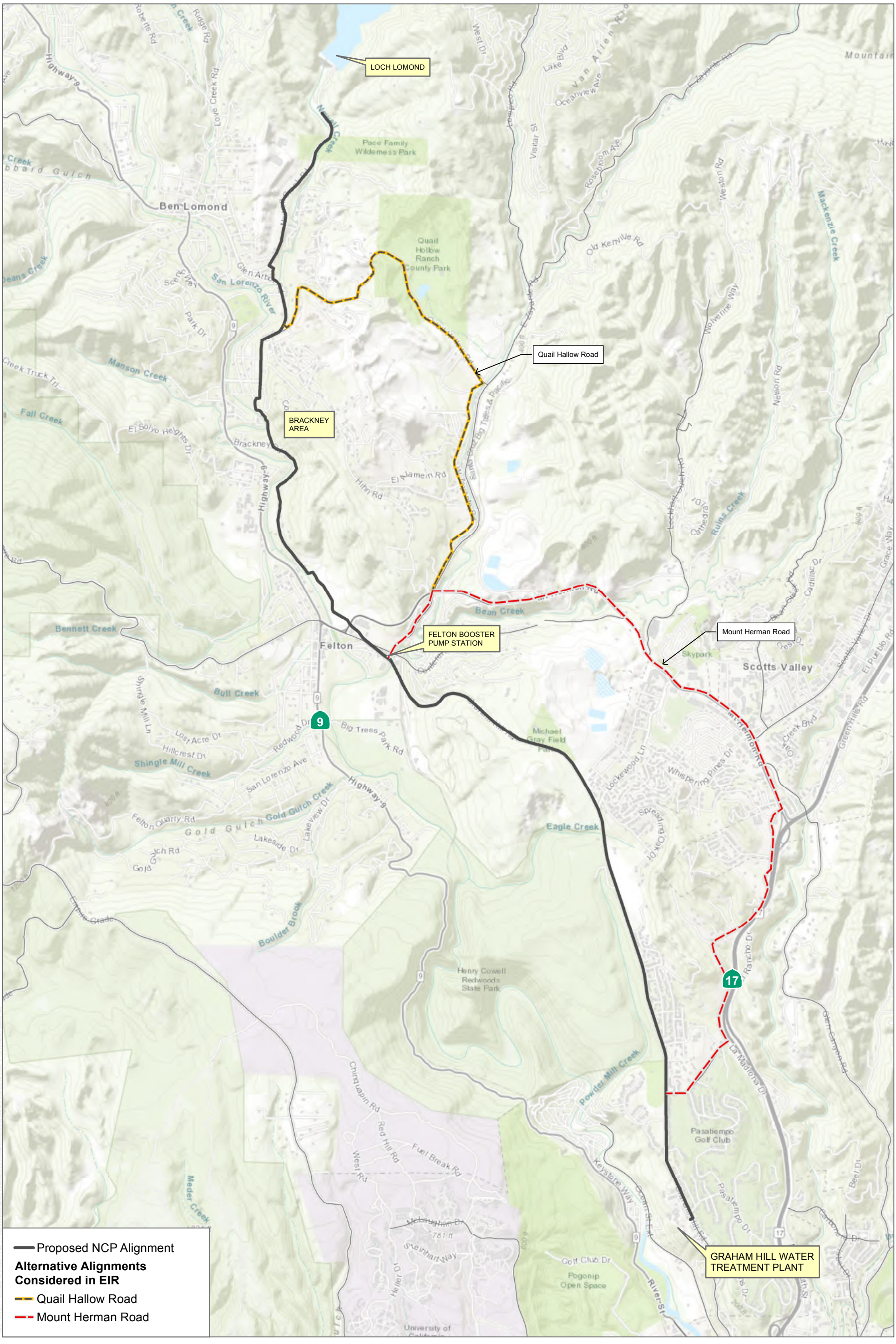
Each alternative is described below. Additionally, the Standard Construction Practices identified in Chapter 3, Project Description, would apply to all alternatives, where relevant. The following discussion reviews whether the alternative would avoid or substantially lessen identified project impacts, whether new significant impacts may occur, and the ability of the alternative to meet project objectives.

No Project Alternative

6.4.1.1 Description

Section 15126.6(e) of the State CEQA Guidelines requires that the impacts of a "no project" alternative be evaluated in comparison to the Proposed Project. Section 15126(e) also requires that the No Project Alternative discuss the existing conditions that were in effect at the time the Notice of Preparation was published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

Under the No Project Alternative, the Proposed Project would not be constructed. The City would continue to repair and/or replace pipeline sections as failures occurred or conditions worsen.



SOURCE: ESRI 2020, County of Santa Cruz 2020, City of Santa Cruz 2020

DUDEK

FIGURE 6-2

Alternative Pipeline Alignments Considered in EIR

Newell Creek Pipeline Improvement Project

6.4.1.2 Impact Analysis

Under the No Project Alternative, the Proposed Project would not be constructed, and the existing NCP would remain in use. Thus, none of the impacts identified in the EIR would occur, including the potentially significant impacts associated with constructing the Proposed Project, such as those related to biological resources (Impacts BIO-1A, BIO-1B, BIO-2, and BIO-3), slope stability hazards (Impact GEO-2), paleontological resources (Impact GEO-4), hazardous materials release (Impact HAZ-2), and permanent or temporary increase in noise in excess of standards (Impact NOI-2).

However, the No Project Alternative likely would require future repairs to the existing NCP, especially along Pipeline Road in Henry Cowell Redwoods State Park. As indicated in Section 6.3.3.2, Southern Segment, the existing pipeline road alignment transverses numerous unstable and extreme slopes with a long history of failures that have threatened or compromised the integrity of the pipeline. While some slides were repaired with soldier pile walls, the roads and soldier walls are experiencing further damage which would require additional engineering controls to stabilize the area if this alignment were continued to be used. The Pipeline Road section has the highest recent break history primarily associated with corrosion, land movement, and clogged or undersized culverts, resulting in significant washout exposing the pipeline and limiting access to make repairs. In addition to affecting water supply reliability, pipe breaks can cause sediments to enter drainages and creeks, resulting in potential water quality impacts. In addition, the remote terrain along this section creates difficulty for City operations to access the alignment for operations and maintenance which is a high priority goal of the City for future reliability of the system. Furthermore, the narrow corridor also presents problems for construction equipment access.

In order to make this alignment a reliable and accessible route for the new pipeline, if it were to be repaired or replaced in the same location, significant improvements to the existing road would be required to allow installation of a new drainage system to reduce erosion damage to the pipeline that has been experienced in the past (HDR 2019a). Retaining walls would also be needed to stabilize many of the active slopes threatening the existing road and pipeline. These improvements could result in potential significant, temporary, construction-related impacts to special status species and sensitive habitat due to presence of Sandhills and Special Forest sensitive habitats.

6.4.1.3 Ability to Meet Project Objectives

The No Project Alternative would not meet any of the identified project objectives. In particular, the No Project Alternative would not address deficiencies in the existing NCP (Objective #1), improve long-term reliability of the City's water infrastructure between Loch Lomond Reservoir and GHWTP (Objective #2), or improve access to the NCP to facilitate inspection, maintenance and repair (Objective #3). The No Project Alternative also would not meet project objectives related to siting the NCP to optimize accessibility and minimize the potential for future failures (Objective #4), and implementing NCP project segments that are cost-effective in terms of both capital and operation/maintenance costs (Objective #5).

6.4.2 Alternative 1A: Alternative Northern Segment Alignment-Quail Hollow Road

6.4.2.1 Description

The Alternative 1A alignment in the northern segment of the Proposed Project would follow Quail Hollow Road from Glen Arbor Road to East Zayante Road and then follow East Zayante Road to the FBPS at Graham Hill Road as shown on Figure 6-2 for a total distance of approximately 5.7 miles. As with the Proposed Project, the Alternative 1A alignment would include the Newell Creek Road and Glen Arbor Road sections, which include the replacement of two existing crossings of Newell Creek. Key elements for the northern segment pipeline alignment with the Alternative 1A section are summarized in Table 6-1. This alignment would completely replace the Brackney North, Brackney South, San Lorenzo Way, and Felton Booster Pump Station sections and part of the Glen Arbor Road section that are part of the Proposed Project. The Proposed Project southern segment would remain the same under this alternative.

Table 6-1. Key Proposed Features of Alternative 1A and 1B Pipeline Sections

Project Feature	Northern Segment Quail Hollow Road Section	Southern Segment Mount Hermon Road Section
Alignment Length (feet)	30,179	33,581
Number of Creek or River Crossings	2	1
Maximum Elevation (feet amsl)	655	611
New Pump Station Required	Yes	No

Source: HDR 2019a.

As with the Proposed Project, it is expected that the pipe would be installed in existing paved and unpaved roadways or ROW. It is expected that construction would consist of conventional open trench methods similar to what is planned for the Proposed Project, except in Brackney North and potentially Brackney South sections, where trenchless methods are planned for most of the Brackney North section and potentially for the Brackney South section. Other components would include installation of minor appurtenances, such as air release valves and isolation valves as with the Proposed Project. Once the new pipeline is installed and the interconnections are made, the existing NCP generally would be abandoned in place. As indicated above, Standard Construction Practices would be implemented as with the Proposed Project. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements as with the Proposed Project.

The Alternative 1A alignment has a maximum elevation of approximately 655 feet amsl, which would require an additional pump station due to the elevation gain required. It is estimated that approximately 5,000-10,000 square feet would be needed for a pump station, although a specific location, facility footprints, and equipment characteristics and sizing are not known at this time. Given typical pump stations in Santa Cruz County, these types of facilities are expected to be single-story buildings with outdoor paved areas surrounded by security fencing. They would also include security lighting that would be limited to low-wattage, shielded outdoor lighting, directed onto the site.

6.4.2.2 Impact Analysis

Biological Resources

The majority of the area along Quail Hollow Road and some areas along East Zayante Road are mapped as potential sensitive Sandhills habitat according to County of Santa Cruz GIS mapping (County of Santa Cruz 2021). The two-lane paved road width on Quail Hollow Road is estimated to be approximately 22 feet wide, and has 2- to 4-foot-wide shoulders adjacent to the pavement (HDR 2019a). However, East Zayante Road is narrower and generally lacks off-road shoulders.

The pipeline is expected to be installed in the paved road, thus avoiding permanent impacts to sensitive habitat. However, construction could result in inadvertent impacts to special status plant and wildlife species associated with Sandhills habitat as well as potential temporary disturbance to sensitive sandhills habitat along both roads, requiring the same mitigation as with the Proposed Project. Potentially significant indirect impacts to sensitive riparian habitat at Newell Creek would remain the same as with the Proposed Project. While some seasonal wetlands would be avoided and impacts to jurisdictional wetlands could be lessened, the Alternative 1A route has at least 18 culverted stream crossings where jurisdictional wetlands may be present (HDR 2019a). Depending on the location and siting of a pump station, new significant impacts to special status species and sensitive habitat, particularly Sandhills habitat and species could occur with Alternative 1A. Therefore, Alternative 1A would not avoid or substantially lessen impacts to special status species, sensitive habitat or jurisdictional wetlands.

Geology and Soils

The Proposed Project would potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, or collapse due to the proposed HDD method proposed at the Brackney North pipe section. This impact, which would occur in the Brackney North section with the Proposed Project, would be avoided under Alternative 1A as the pipeline would be installed in Quail Hollow Road instead of in the Brackney North section where the impact would occur, and conventional open trench construction methods would be used in Quail Hollow Road and East Zayante Road. Other less-than-significant impacts related to seismic and geologic hazards and expansive soils would remain the same as the Proposed Project.

The Proposed Project could potentially destroy a unique paleontological resource during construction. Construction under Alternative 1A would avoid sensitive geologic formations with potential paleontological resources in the Brackney North and Brackney South sections. However, most of the Quail Hollow Road area and part of the East Zayante Road area are located in the sensitive Santa Margarita formation, which covers more area in the northern segment than with the Proposed Project. Thus, Alternative 1A could potentially result in more significant impacts to paleontological resources than the Proposed Project as a larger area is in sensitive formations. Therefore, Alternative 1A would not avoid or substantially lessen potential significant impacts to paleontological resources, and could result in increased impacts.

Hazardous Materials

The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. Alternative 1A would substantially lessen this impact as the alignment along Quail Hollow Road and East Zayante Road is not located in proximity to any identified California Department of Toxic Substance Control hazardous sites or leaking underground storage tanks (LUST) sites.

Hydrology and Water Quality

Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except that the HDD construction method proposed in the Brackney North section could result in release of drilling fluids into San Lorenzo River without mitigation. This impact would be avoided under Alternative 1A as the pipeline would be installed in Quail Hollow Road instead of in the Brackney North section where this impact could occur. Generally, the less-than-significant impact related to drainage would remain similar to the Proposed Project. However, there would be a slight increase in impervious surfaces with construction of a pump station required under Alternative 1A. Such a facility would be relatively small and would not substantially alter drainage patterns or indirectly cause erosion, flooding or exceed capacity of stormwater systems.

Noise

Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established in local general plans or noise ordinances, with a significant unavoidable impact in the Brackney North and Brackney South sections due to limited nighttime construction. Alternative 1A would eliminate the significant and unavoidable noise impact by installing the pipe in Quail Hollow Road and avoiding the Brackney North and Brackney South sections. However, construction would result in temporary construction-noise impacts to residents along Quail Hollow Road and East Zayante Road, requiring mitigation as with the Proposed Project. Thus, Alternative 1A would substantially lessen significant construction-related noise impacts. However, depending on the location and siting of the pump station, there could be new operational noise-related impacts associated with this facility.

Other Impacts

Other less-than-significant impacts that would result from construction of the Proposed Project are expected to remain the same under Alternative 1A, specifically cultural resources and wildfire impacts. No recorded cultural resources were identified as part of the cultural resources records search, except for historical resources at Quail Hollow Ranch that likely would not be impacted with pipeline construction within the roadway.

Because the pipeline length is longer with Alternative 1A than the Proposed Project (approximately 8.0 miles compared to approximately 4.5 miles with the Proposed Project), Alternative 1A could result in increased construction days and associated construction-relation emissions, although it would not be expected to substantially increase daily emissions or exceed Monterey Bay Air Resources District criteria pollutant emission standards. Similarly, construction would result in increased greenhouse gas (GHG) emissions, but similar to

criteria air pollutants, would not be expected to exceed thresholds; even with a doubling in GHG emissions, Alternative 1A would not exceed GHG emissions thresholds as amortized over a 30-year period.

The pump station needed with Alternative 1A would result in increased permanent energy demand, and indirect emissions due to operations and worker trips, although it would not be expected to result in inefficient or wasteful use of energy resources.

Given the narrow width of East Zayante Road, construction may result in temporary road closure, requiring detours for local traffic (HDR 2019a). However, closures would only occur during the work day and would be short term and temporary and would not significantly impact emergency access. Therefore, Alternative 1A would result in new traffic-related delays on roads in the northern segment that were not identified for the Proposed Project, but with required traffic controls and detours, would not prelude emergency access to the area.

6.4.2.3 Ability to Meet Project Objectives

Alternative 1A would meet most of the project objectives, including addressing deficiencies in the existing NCP (Objective #1), improving long-term reliability of the City's water infrastructure between Loch Lomond Reservoir and GHWTP (Objective #2), and improving access to the NCP to facilitate inspection, maintenance and repair (Objective #3). Alternative 1A would partially meet the project objective related to siting the NCP to optimize accessibility and minimize the potential for future failures (Objective #4) due to the increased length in the pipeline. However, Alternative 1A would not meet the project objective to regarding cost-effectiveness (Objective #5) as additional operation/maintenance costs would be incurred with construction of a pump station needed to support a pipeline for the Alternative 1A alignment. Additionally, substantial construction and material costs would be incurred relative to the Proposed Project due to the increased length of pipeline (4.5 miles for the Proposed Project compared to 8.0 miles for Alternative 1A). See Table 6-2 at the end of this section for comparison on each alternative's ability to attain project objectives.

6.4.3 Alternative 1B: Alternative Southern Segment Alignment-Mount Hermon Road

6.4.3.1 Description

The Alternative 1B alignment in the southern segment would extend from the FBPS to Mount Hermon Road to La Madrona Drive to Sims Road and then west along Sims Rd to Graham Hill Road, tying into the existing Graham Hill Road pipeline alignment as shown on Figure 6-2, for a total distance of approximately 6.5 miles. Key elements for the southern segment pipeline alignment with the Alternative 1B section are summarized in Table 6-1. It is expected that the pipeline would be installed in existing road pavement or right-of-way. This alignment would replace existing pipeline sections (Pipeline Road, Henry Cowell State Park, and San Lorenzo Lumber Yard), completely bypassing Henry Cowell Redwoods State Park as with the Proposed Project. Alternative 1B also would realign 1,050 feet of the current Graham Hill Road alignment. The Proposed Project northern segment would remain the same under this alternative.

This alignment has a maximum elevation of 611 feet amsl, and would not require a new pump station, although there would be one crossing of Zayante Creek and one crossing of Bean Creek (HDR 2019a). The

route starts on East Zayante Road from the FBPS and heads north until connecting with Mount Hermon Road; however East Zayante Road extends under Mount Hermon Road. This results in approximately 450 feet of elevated road over both East Zayante Road and Zayante Creek which would require an elevated bridge dedicated to the new NCP.

Except for the creek crossings, it is expected that the pipe would be installed in existing paved roadways or ROW as with the Proposed Project. It is expected that construction would consist of conventional open trench methods similar to what is planned for the Proposed Project. Other components would include installation of minor appurtenances, such as air release valves and isolation valves as with the Proposed Project. Once the new pipeline is installed and the interconnections are made, the existing NCP generally would be abandoned in place. As indicated above, Standard Construction Practices would be implemented as with the Proposed Project. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements as with the Proposed Project.

6.4.3.2 Impact Analysis

Biological Resources

The majority of the area along East Zayante Road and Mount Hermon Road, as well some areas along Sims Road, are mapped as potential sensitive Sandhills habitat according to County of Santa Cruz GIS mapping (County of Santa Cruz 2021). The majority of Mount Hermon Road has 3-4 four lanes with 4- to -6-foot shoulders; where the road narrows the number of lanes reduces to 2. The shoulder beyond the white lines remains 4-6 feet on both side of the road. The other roads are narrower and lack shoulders.

The pipeline is expected to be installed in the paved road, thus avoiding permanent impacts to sensitive habitat. However, construction could result in inadvertent impacts to special status plant and wildlife species associated with Sandhills habitat if present in the area during construction, as well as potential temporary disturbance to sensitive sandhills habitat along both roads, requiring the same mitigation as with the Proposed Project. The impact would be similar to the Proposed Project, and possibly greater because the Alternative 1B alignment is longer than the Proposed Project.

Potentially significant indirect impacts to sensitive riparian habitat at Newell Creek would remain the same as with the Proposed Project. A crossing over Zayante Creek would be required and given the steep terrain, a bridge to support the pipe would be considered. Additionally, a second crossing over or under Bean Creek would be required. Riparian vegetation could be temporarily removed or impacted during construction at these locations. Additionally, dewatering and stream bypass may also be required for the additional creek crossings, which could result in additional impacts to aquatic species. Thus, impacts to riparian habitat would remain unchanged or potentially be greater than those with the Proposed Project. While some seasonal wetlands would be avoided and impacts to jurisdictional wetlands could be lessened along Graham Hill Road, Alternative 1B also has the potential to temporarily disturb jurisdictional wetlands adjacent to culverted drainages and other intermittent drainages present along the roads in Alternative 1B. Therefore, Alternative 1B would not avoid or substantially lessen impacts to special status species, sensitive habitat or jurisdictional wetlands.

Geology and Soils

The Proposed Project would potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse due to the proposed HDD method proposed at the Brackney North pipe section. This impact would remain the same as the Proposed Project as Alternative 1B does not change the alignment in the northern segment. Other less-than-significant impacts related to seismic and geologic hazards and expansive soils would remain the same as the Proposed Project. While there is a mapped landslide hazard area east of Mount Hermon Road near Locatelli Road, Alternative 1B does not traverse any areas of known landslide deposits. However, the alignment does traverse an area of potential liquefaction in Scotts Valley that would require additional review.

The Proposed Project could potentially destroy a unique paleontological resource during construction. Construction under Alternative 1B would avoid sensitive geologic formations with potential paleontological resources in the Graham Hill Road section. Alternative 1B also would traverse sensitive Santa Margarita formation that has high sensitivity for paleontological resources. It appears that a similar area is covered in this formation as the Proposed Project. Therefore, potential impacts to paleontological resources under Alternative 1B would be similar to those with the Proposed Project. Therefore, Alternative 1B would not avoid or substantially lessen potential significant impacts to paleontological resources, and could result in increased impacts.

Hazardous Materials

The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. There are several existing hazardous materials sites on Mount Hermon Road, as well as several LUST sites. Therefore, Alternative 1B would be potentially exposed to release of hazardous materials during construction as with the Proposed Project, requiring the same mitigation. Therefore, Alternative 1b would not avoid or substantially lessen potential significant impacts to paleontological resources, and could result in increased impacts.

Hydrology and Water Quality

Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except that the HDD construction method proposed in the Brackney North section could result in release of drilling fluids into San Lorenzo River without mitigation. This impact would remain the same as the Proposed Project with Alternative 1B since the alternative does not change the alignment in the northern segment. The less-than-significant impact related to drainage would remain similar to the Proposed Project as construction would not result in new impervious surfaces that would alter drainage patterns or indirectly cause erosion, flooding or exceed capacity of stormwater systems.

Noise

Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established

in local general plans or noise ordinances, with a significant unavoidable impact in the Brackney North and potentially Brackney South sections due to limited nighttime construction. Alternative 1B would not eliminate the significant unavoidable impact at Brackney North section as Alternative 1B does not change the alignment in the northern segment. Construction would result in temporary construction-noise impacts to residents, particularly along Sims Road and a portion of La Madrona Drive. The majority of land uses along Mount Hermon Drive are non-residential without sensitive receptors. Therefore, Alternative 1B could result in some lessening of construction-related noise impacts because there are fewer sensitive receptors along the alignment than with the Proposed Project.

Other Impacts

Other less-than-significant impacts that would result due to construction of the Proposed Project are expected to remain the same under Alternative 1B related to cultural resources and wildfire impacts. No recorded cultural resources were identified as part of the cultural resources records search.

Because the pipeline length is longer with Alternative 1B than the Proposed Project (approximately 6.5 miles compared to approximately 4.5 miles with the Proposed Project), Alternative 1B could result in increased construction days and associated construction-relation emissions, although it would not be expected to substantially increase daily emissions or exceed Monterey Bay Air Resources District criteria pollutant emission standards, but would extend the number of construction days with emissions. Similarly, construction would result in increased GHG emissions, but similar to criteria air pollutants, would not be expected to exceed thresholds; even with a doubling in GHG emissions, Alternative 1B would not exceed GHG emissions thresholds as amortized over a 30-year period. Similarly, there could be some increase in constructed-related fuel use with the longer alignment and additional construction days. However, such consumption would not be expected to result in inefficient or wasteful use of energy resources, similar to the Proposed Project.

Mount Hermon is a 4-lane arterial road, but East Zayante, La Madrona, and Sims Roads are all 2-lane roads. Given the narrow width of East Zayante Road, construction may result in temporary road closure, requiring detours for local traffic (HDR 2019a). However, closures would only occur during the work day and would be short term and temporary and would not significantly impact emergency access. Adequate road width is available on the other roads so temporary, daily lane closures likely would occur but not complete road closures (HDR 2019a). Therefore, Alternative 1B would result in new traffic-related delays on roads in the northern segment that were not identified for the Proposed Project, but with required traffic controls and detours, would not prelude emergency access to the area.

6.4.3.3 Ability to Meet Project Objectives

Alternative 1B would meet most of the project objectives, including addressing deficiencies in the existing NCP (Objective #1), improving long-term reliability of the City's water infrastructure between Loch Lomond Reservoir and GHWTP (Objective #2), and improving access to the NCP to facilitate inspection, maintenance and repair (Objective #3). Alternative 1B would partially meet the project objective related to siting the NCP to optimize accessibility and minimize the potential for future failures (Objective #4) due to the increased length in the pipeline. However, Alternative 1B would not meet the project objective to regarding cost-effectiveness (Objective #5) as additional operation/maintenance costs would be incurred with construction of a pump station needed to support a pipeline in the Alternative 1B alignment. See Table 6-2 at the end of this section for comparison on each alternative's ability to attain project objectives.

6.4.4 Alternative 2: Brackney North Pipe Section Alternative Construction Methods

6.4.4.1 Introduction

As indicated in Section 6.3.3, Brackney North Pipe Section Alternative Construction Methods, several trenchless construction methods were evaluated by the City and its design engineers for construction in the Brackney North section. The Proposed Project consists of the HDD method, and a second option was evaluated. The alternative HDD Option A in the Alternatives Analysis for Brackney North (Mott MacDonald 2021) is an approximate 2,075-foott long pipeline that extends from Glen Arbor Road in the north (instead of Schaaf Road with the Proposed Project) to Brackney Road in the south. This alternative alignment is also included as an option in the 30% engineering plans. This alternative HDD option would reach a depth of 100+ feet below the elevation of the HDD entry and exit point. The drilling activities would be conducted from a temporary work area at the south end of the alignment, alongside Brackney Road, the same as the Proposed Project (Mott MacDonald 2021).

The primarily difference between this HDD alternative and the Proposed Project is that the alternative HDD work area at the north end of the alignment is located within Glen Arbor Road and Caledonium Avenue instead of Schaaf Road with the Proposed Project. A single lane of road would need to be shut down during drilling activities, and during pullback, the road would need to be temporarily closed to give space for a pullback drill rig, drilling mud plant, and other materials and equipment. Road detours and other traffic control measures would be required at the HDD exit area in Glen Arbor Rd. The alignment would deviate outside the existing city easement for most of its length, thus requiring acquisition of permanent easement for the new pipeline (Mott MacDonald 2021).

Except for the change described above, the alternative HDD method would not change significant and other less-than-significant impacts identified and evaluated for the Proposed Project. Therefore, this alternate HDD method is not further evaluated as impacts would be the same as the Proposed Project, and the following section evaluates the microtunneling construction method.

6.4.4.2 Alternative Microtunneling Method Project Description

The microtunnel Alternative 2 consists of a near horizontal excavation originating from a launch or jacking shaft and ending at a reception or receiving shaft. Generally, microtunneling is a guided and steered trenchless construction method that does not require person entry. Microtunneling utilizes a highly automated and mechanized tunnel boring machine called a microtunnel boring machine (MTBM) which is advanced through the ground using the pipe jacking method. Other features of the method include earth and hydrostatic counter balancing methods to control ground and groundwater inflow into the tunnel. Microtunneling can be performed in soil, rock, and mixed face conditions, has the ability to complete drive lengths up to 2,000 feet or more, and can navigate horizontal and/or vertical curves in the alignment. Diameters range from 16 inches to 16 feet, though the minimum diameter increases with tunnel length to ensure the machine has enough thrust force to complete the longer lengths. A variety of casing materials are available with the most typical being steel, reinforced concrete, and centrifugally cast glass-fiber-reinforced polymer mortar (CCFRPM) as manufactured by Hobas® (Mott MacDonald 2021).

Several microtunnel options were considered, all of which would be installed via a two-pass system. The first pass consists of an oversized initial support system installed behind the boring machine, shield, or excavator. The second pass consists of the installation of the carrier pipe within the completed tunnel. The space between the initial support and carrier pipe is typically backfilled with low strength material but can remain open if desired (Mott MacDonald 2021).

- Tunnel Option A - Tunnel launch would be from Brackney Road, and tunnel reception would be within the Caledonium Avenue public right-of-way. The alignment is approximately 1,400 feet long and consists of two 800-foot radius curves. The depths of shafts are approximately 50 feet at Brackney Road and 55 feet at Caledonium Avenue.
- Tunnel Option B - Tunnel launch would be the same as Tunnel Option A, and tunnel reception would be at the end of Fremont Avenue. The alignment is approximately 1,150 feet long and consists of one 800-foot radius curve. The depths of shafts are approximately 45 feet at Brackney Road and 35 feet at Fremont Avenue.
- Tunnel Option C – Tunnel launch would be the same as Tunnel Options A and B, but the tunnel reception would be within Schaaf Road. The alignment is approximately 1,700 feet long and consists of one 800-foot radius curve. The depths of shafts are approximately 35 feet at Brackney Road and 35 feet at Schaff Road (Mott MacDonald 2021).

6.4.4.3 Impact Analysis

Biological Resources

The northern end of the construction zone for the microtunneling construction method is within a sensitive Sandhills habitat area, and thus, potentially significant impacts related to special status species and temporary disturbance to Sandhills habitat and jurisdictional wetlands would remain the same as the Proposed Project in this location, thus requiring similar mitigation . Therefore, Alternative 2 would not avoid or substantially lessen impacts to special status species, sensitive habitat or jurisdictional wetlands.

Geology and Soils

The Proposed Project would potentially cause adverse effects involving landslides or be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, slope failure/instability, subsidence, or collapse due to the proposed Horizontal Directional Drilling (HDD) method proposed at the Brackney North pipe section. This impact would not be avoided or substantially lessened under Alternative 2 as the microtunneling construction method also could result in inadvertent release of fluids during construction as explained below.

Microtunneling operations use three types of fluids: slurry at the face of the machine, lubrication within the annular space between the casing and the ground to reduce frictional forces, and contact grout within the same annular space to reduce future ground movement at the surface. Conventional bored tunneling operations may also inject grout between installed liner plate and the ground. Inadvertent returns of these fluids can occur when the fluid pressure is greater than the pressure of the surrounding ground. Topography with high relief such as the steep slopes of this project site carry higher risk of inadvertent returns because there is less ground pressure resisting the fluid pressure in the horizontal direction. Mitigation includes

optimization of the horizontal alignment during design, increasing the depth of the tunnel, and monitoring of fluid pressures during construction. Potential mitigation also includes building a berm and retaining wall to increase the distance from the tunnel to the open slope (Mott MacDonald 2021).

All tunnel alignment alternatives cross the Ben Lomond fault, which is assumed to be inactive, and therefore, the risk of fault rupture is very low, same as the Proposed Project. However, conventional bored tunneling may encounter problems within the fractured rock near a fault zone including highly adverse groundwater and ground inflow. Mitigation of adverse ground and groundwater conditions usually entails pre-excavation ground treatment (i.e. grouting or dewatering), pressurized face tunneling such as microtunneling, or a combination of the two. As long as the tunnel alignment is located fully within rock, the risk of triggering a landslide during construction should be low. The tunnel should be located deep enough to reduce the risk of encountering low-points in the soil/rock profile which could lead to ground loss. (Mott MacDonald 2021).

The Proposed Project could potentially directly or indirectly destroy a unique paleontological resource or site during construction. Construction under Alternative 2 would not avoid or substantially reduce impacts to sensitive geologic formations with potential paleontological resources as this alternative includes the same work area as the Proposed Project. It is noted that only a small portion of the pipe section at the southern end is within a paleontologically sensitive (Monterey Formation) area.

Hazardous Materials

The Proposed Project would be located adjacent to sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment. However, the Brackney North section is not located in proximity to identified hazardous materials sites, and no changes are made to other sections of the Proposed Project under Alternative 2. Therefore, Alternative 2 would not avoid or substantially lessen impacts related to hazardous materials sites.

Hydrology and Water Quality

Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality, except that the HDD construction method proposed in the Brackney North section could result in release of drilling fluids into San Lorenzo River without mitigation. This impact would not be avoided or substantially lessened under Alternative 2 as the alternative microtunneling construction method has the same potential for inadvertent release of fluids as the Proposed Project.

Noise

Construction of the Proposed Project would result in generation of a substantial temporary increase in ambient noise levels in the vicinity of some Proposed Project pipe sections in excess of applicable standards established in local general plans or noise ordinances, with a significant unavoidable impact in the Brackney North section due to limited nighttime construction. For microtunneling, the primary sources of noise are the slurry separation plant and generator that could result in significant noise impacts, and depending on the selected method, construction of the shafts can cause noise and vibrations. Rock excavation for the shafts could require impact-type excavation methods, such as hoe-rams, however blasting is not anticipated based

on potential rock types and geophysics results. Tunneling can also cause vibrations at the surface though the tunnel alternatives are considered deep enough to mitigate these impacts (Mott MacDonald 2021). Therefore, Alternative 2 would not avoid or substantially lessen noise impacts associated with the HDD construction method of the Proposed Project, and could potentially result in temporary increased vibration levels during construction.

Other Impacts

Other less-than-significant impacts that would result due to construction of the Proposed Project are expected to remain the same under Alternative 2 related to cultural resources and wildfire impacts. No recorded cultural resources were identified in the Brackney North area as part of the project archaeological investigation. Because the microtunneling method would result in a similar construction duration period as the Proposed Project, less-than-significant impacts related to air quality, energy, GHG emissions, and transportation are expected to be the same or similar to the Proposed Project.

6.4.4.4 Ability to Meet Project Objectives

Alternative 2 would meet most of the project objectives, including addressing deficiencies in the existing NCP (Objective #1), improving long-term reliability of the City's water infrastructure between Loch Lomond Reservoir and GHWTP (Objective #2), improving access to the NCP to facilitate inspection, maintenance and repair (Objective #3), and siting the NCP to optimize accessibility and minimize the potential for future failures (Objective #4). However, Alternative 2 would not fully meet the project objective to regarding cost-effectiveness (Objective #5) as the microtunneling alternative is estimated to cost approximately $14-18 million dollars, which is about four times the cost of the Proposed Project. See Table 6-2 at the end of this section for comparison on each alternative's ability to attain project objectives.

6.5 Environmentally Superior Alternative

The CEQA Guidelines (Section 15126.6[a]) requires that an EIR's analysis of alternatives identify the "environmentally superior alternative" among all of those considered. In addition, Section 15126.6(e)(2) states that if the environmentally superior alternative is the No Project Alternative, the EIR must also identify an environmentally superior alternative among the other alternatives. Furthermore, Public Resources Code Sections 21002 and 21081 require lead agencies to adopt feasible mitigation measures or feasible alternatives in order to substantially lessen or avoid otherwise significant adverse environmental effects, unless specific economic, legal, social, technological, or other conditions make such mitigation measures or alternatives infeasible.

Table 6-3 presents a comparison of project impacts between the Proposed Project and the alternatives. The No Project Alternative would reduce or avoid impacts to some environmental resources. Alternative 1A would avoid significant impacts related to geology (GEO-2), hazardous materials (HAZ-3), and hydrology (HYDRO-1). Other significant impacts would remain the same as with the Proposed Project, except that biological resource impacts (BIO-1A, BIO-1B, BIO-2) and paleontological resource impacts (GEO-4) could increase in severity over the Proposed Project. However, Alternative 1A would reduce impacts associated with noise impacts (NOI-2) from significant unavoidable to less than significant with mitigation. Alternative 1B would lessen significant impacts related to some biological resources (BIO-1A, BIO-3-jurisdictional wetlands) and paleontological

impacts (GEO-4), but impacts would continue to be significant, requiring mitigation as with the Proposed Project. Other significant impacts would remain the same as the Proposed Project, except that some biological resource impacts (BIO-1B, BIO-2) and hazardous materials impacts (HAZ-3) could increase in severity over the Proposed Project. Alternative 2 would not avoid or substantially reduce any identified significant impacts.

Overall, of the alternatives considered, Alternative 1A would eliminate or reduce the severity of more identified significant impacts than the other alternatives reviewed and also attain most of the project objectives. Therefore, Alternative 1A is considered the environmentally superior alternative of the CEQA alternatives reviewed.

Table 6-2. Ability of Alternatives to Meet Project Objectives

Objective	Proposed Project	No Project Alternative	Alternative 1A	Alternative 1B	Alternative 2
Objective #1: Address identified deficiencies in the NCP conditions in order to maintain full system functioning without interruption, in order to protect water supply reliability and service to the City's customers.	Excellent	Poor	Excellent	Excellent	Excellent
Objective #2: Improve long-term reliability of the City's water supply infrastructure between Loch Lomond Reservoir and the Graham Hill Water Treatment Plant (GHWTP) such that it can continue to function as an integral part of the City's overall water supply system.	Excellent	Poor	Excellent	Excellent	Excellent
Objective #3: To Improve access to the NCP to facilitate inspection, maintenance, and repair of the pipeline system, while minimizing the potential for environmental and propety damage impacts (such as may occur in State Parks and other sensitive areas).	Excellent	Poor	Excellent	Excellent	Excellent
Objective #4: Site the NCP to consider constructability, optimize accessibility for maintenance, minimize the potential for future failures due to unstable terrain, and avoid risks (e.g., public safety, property damage) and impacts to adjacent uses associated with pipeline failures during the life of the pipeline.	Excellent	Poor	Moderate	Moderate	Excellent
Objective #5: Implement NCP project segments that are cost-effective in terms of both capital and operation/maintenance costs.	Excellent	Poor	Poor	Moderate	Poor

Table 6-3. Comparison of Significant Impacts from the Alternatives

Environmental Issue	Proposed Project	No Project Alternative	Alternative 1A	Alternative 1B	Alternative 2
Impact BIO-1A: Special-Status Plant Species	LSM	NI	LSM↑	LSM ↓	LSM
Impact BIO-1B: Special-Status Wildlife Species	LSM	NI	LSM↑	LSM↑	LSM
Impact BIO-2: Riparian and Sensitive Vegetation Communities (Sandhills, Special Forest)	LSM	NI	LSM↑	LSM↑	LSM
Impact BIO-3: Jurisdictional Aquatic Resources	LSM	NI	LSM	LSM ↓	LSM
Impact GEO-2: Unstable Geologic Unit or Soils	LSM	NI	NI	LSM	LSM
Impact GEO-4: Paleontological Resources	LSM	NI	LSM↑	LSM ↓	LSM
Impact HAZ-3: Hazardous Materials Sites	LSM	NI	NI	LSM↑	LSM
Impact HYD-1: Surface Water Quality	LSM	LSM↑	NI	LSM	LSM
Impact NOI-2: Substantial Increase in Ambient Noise Levels in Excess of Standards	SU[1]	NI	LSM	SU[1]	LSM↑

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

[1] The significant unavoidable construction noise impact associated with the Proposed Project (Impact NOI-2) would result only from construction activities at the Brackney North pipe section. The impacts of all other construction activities would be either less than significant or less than significant with mitigation.

6.6 References

County of Santa Cruz. 2021. Geographic Information Services. Accessed September 27, 2021 at https://www.santacruzcounty.us/Departments/GeographicInformationSystems(GIS).aspx.

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7 List of Preparers

7.1 City of Santa Cruz Staff

Heidi Luckenbach	Interim Water Director
Kevin Crossley	Interim Deputy Water Director/Engineering Manager
Sarah Easley-Perez	Principal Planner
Danny DeBrito	Associate Planner, Project Environmental Lead
Douglas Valby, PE	Associate Civil Engineer, Project Manager
Lewis Kay	Engineering Associate, Project Manager
Ezekiel Bean	Associate Planner

7.2 City of Santa Cruz Consultant Team

HDR	Engineering and EIR Oversight Leslie Tice, Environmental Advisor Mike Munson, Assistant Project Manager Shane Clements, Engineering Support David Petree, Traffic Engineer
Dudek	EIR Consultant – see Section 7.3
Carollo Engineers	Design Engineers for Graham Hill Road Pipe Sections
Mott MacDonald	Design Engineers for Brackney North Pipe Section

7.3 EIR Preparer - Dudek

Project Manager	Stephanie Strelow
Air Quality, Greenhouse Gas Emissions, Energy	Matthew Morales
Biological Resources	Sean O'Brien Ryan Henry Matt Ricketts Emily Scricca Elizabeth Spear Sheldon Leiker Michelle Laskowski
Cultural Resources and Tribal Cultural Resources	Ryan Brady, MA, RPA Kathryn Haley, MA John Schlagheck, MA, RPA Fallin Steffen, MPS

Geology and Soils	Perry Russell, PG Michael Williams, PhD
Hazards, Hazardous Materials, and Wildfire	Perry Russell, PG
Hydrology and Water Quality	Eric Schniewind, PG
Noise	Michael Carr, INCE
Transportation	Dennis Pascua Mladen Popovic
Alternatives	Stephanie Strelow
Assistance with Other Sections	Daniel Hoffman
Graphics	Tyler Friesen
Editing and Production Assistance	Steve Taffolla Daniel Kil Briana Tellez