DRAFT ENVIRONMENTAL IMPACT REPORT

Climate Resilient Santa Cruz:

Graham Hill Water Treatment Plant Facility Improvements Project

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

DECEMBER 2023

CITY OF SANTA CRUZ Water Department

Our Water, Our Future

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
3CE	Central Coast Community Energy
AB	Assembly Bill
A/C	air conditioning
ACC	Advanced Clean Cars
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADA	Americans with Disabilities Act
ADT	average daily traffic
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AFV	alternative fuel vehicle
amsl	above mean sea level
AMTB	Amah Mutsun Tribal Band
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
ARC	Agriculture, Natural Resources + Conservation
ASR	aquifer storage and recovery
bgs	below ground surface
BMP	best management practice
BREC	Biological Resources Existing Conditions Report
BSA	biological study area
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalARP	California Accidental Release Prevention
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California's Green Building Standards
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code
CCE	Community Choice Energy
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	contaminant of emerging concern
CEQA	California Environmental Quality Act

Acronym/Abbreviation	Definition
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERS	California Environmental Reporting System
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
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CMU	concrete masonry unit
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRIER	Cultural Resources Inventory and Evaluation Report
CRPR	California Rare Plant Rank
CSA	County Service Area
CSCHRI	City of Santa Cruz Historic Resource Inventory
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
cy	cubic yard
CZU	San Mateo – Santa Cruz Unit
dB	decibel
dBA	A-weighted decibel
DBP	Disinfectants and Disinfection Byproducts
DDW	California Division of Drinking Water
DPM	diesel particulate matter
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	California 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
ESL	environmental screening level
FAA	Federal Aviation Administration

Acronym/Abbreviation	Definition
FESA	federal Endangered Species Act
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
G	global
GAC	granular activated carbon
GHG	greenhouse gas
GHWTP	Graham Hill Water Treatment Plant
gpm	gallons per minute
GSP	groundwater sustainability plan
GWP	global warming potential
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HCP	habitat conservation plan
HDD	horizontal directional drilling
HERO	Human and Ecological Risk Office
HFC	hydrofluorocarbon
HiAP	Health in All Policies
HMBC	hazardous materials business plan
HRA	health risk assessment
HSA	hydrologic subarea
HUC	hydrologic unit code
HVAC	heating, ventilation, and air conditioning
IFC	International Fire Code
in/sec	inches per second
IP	Invertebrate Paleontology
IPCC	Intergovernmental Panel on Climate Change
ISTEA	Intermodal Surface Transportation Efficiency Act
ITP	incidental take permit
IX	ion exchange
kBTU	thousand British thermal units
$KMnO_4$	potassium permanganate
kWh	kilowatt-hour
LACM	Natural History Museum of Los Angeles County
LAFCO	Local Agency Formation Commission
LBP	lead-based paint
LCP	local coastal program
L_{dn}	day-night average noise level
LED	light-emitting diode
L_{eq}	equivalen noise level
LEHCP	low-effect habitat conservation plan
LEV	low-emission vehicle
LID	low impact development
L_{max}	maximum noise level

Acronym/Abbreviation	Definition
L_{min}	minimum noise level
LOS	level of service
LOX	liquid oxygen
LT	Long-Term
LUST	leaking underground storage tank
L_x	noise level exceeded *x* percent of a specific period
MBARD	Monterey Bay Air Resources District
MCC	Motor Control Center
MCL	maximum contaminant level
MEIR	Maximum Exposed Individual Resident
MEIW	Maximum Exposed Individual Worker
mg/cm^2	milligram per square centimeter
mgd	million gallons per day
mg/kg	milligrams per kilogram
MHJB	Mount Hermon June beetle
MLD	most likely descendant
MM	Mitigation Measure
MMT	million metric tons
mph	miles per hour
MPO	metropolitan planning organization
MRZ	Mineral Resource Zone
MT	metric ton
MTIP	Metropolitan Transportation Improvement Program
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
Mw	moment magnitude
MWh	megawatt-hour
mya	million years ago
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan(ning)
NCP	Newell Creek Pipeline
NESHAP	National Emission Standards for Hazardous Air Pollutants
NF_3	nitrogen trifluoride
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
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 unit

Acronym/Abbreviation	Definition
NWIC	Northwest Information Center
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OMHCP	Operations and Maintenance Habitat Conservation Plan
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PCE	passenger car equivalence
PCE	primary constituent element
PFAS	per- and polyfluoroalkyl substances
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
PRIMP	Paleontological Resources Impact Mitigation Program
RCRA	Resource Conservation and Recovery Act
RFS	Renewable Fuel Standard
RMP	Risk Management Plan
RMS	root mean square
ROG	reactive organic gas
RPS	Renewables Portfolio Standard
RRF	Resource Recovery Facility
RSL	regional screening level
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
S	state
Santa Cruz Water Rights Project	Santa Cruz Water Rights Project
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SCCSD	Santa Cruz County Sanitation District
SCMTD	Santa Cruz Metropolitan Transit District
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Officer
SLF	Sacred Lands File
SLM	sound level meter
SLV	San Lorenzo Valley
SLVWD	San Lorenzo Valley Water District
SO_2	sulfur dioxide
SOP	standard operating procedure

Acronym/Abbreviation	Definition
SOWF Policy	Securing Our Water Future Policy
SO_x	sulfur oxides
SPCC	spill prevention, control, and countermeasure
SRRE	Source Reduction and Recycling Element
STLC	soluble threshold limit concentration
SVP	Society of Vertebrate Paleontology
SWMP	stormwater management plan
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCLP	toxicity characteristic leaching procedure
TMDL	total maximum daily load
TNM	Highway Traffic Noise Model
TOC	total organic carbon
TPH-g	total petroleum hydrocarbons as gasoline
TTLC	total threshold limit concentration
UC	University of California
UCMP	University of California Museum of Paleontology
UF	ultrafiltration membrane filtration
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
UWMP	Urban Water Management Plan
VdB	vibration decibel
VMT	vehicle miles traveled
VOC	volatile organic compound
VP	Vertebrate Paleontology
WSAC	Water Supply Advisory Committee
WUI	wildland–urban interface
WWTF	wastewater treatment facility
ZEV	zero-emission vehicle

1 Summary

1.1 Introduction

This environmental impact report (EIR) evaluates the potential for significant environmental impacts from the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). Climate Resilient Santa Cruz is an ongoing initiative of the City of Santa Cruz that aims to respond to anticipated future impacts from climate change. 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

Chapter 3, Project Description, provides a detailed description of the Proposed Project. A summary of that information is provided herein.

1.2.1 Project Location and Setting

The Proposed Project would primarily be constructed and located at the City's existing GHWTP, located within City limits. Additionally, the Proposed Project is anticipated to involve activities outside of the GHWTP for the purposes of temporary construction staging and potential utility and traffic safety improvements. The Proposed Project is anticipated to be located at four sublocations of the primary project site, and construction would be supported using two staging areas, which together constitute the project site. The project site locations include:

- Primary Project Site – The approximately 17.1-acre primary project site consisting of the GHWTP parcel, a utility corridor between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension, a portion of the Graham Hill Road right-of-way near the GHWTP entrance, and an alternate sanitary sewer lateral replacement area along a portion of Ocean Street Extension.
- Staging Areas – The 5.1-acre Mt. Hermon Road staging area at the northern intersection of Graham Hill Road and Mt. Hermon Road, in Felton, and a 1.9-acre Ocean Street Extension staging area on Ocean Street Extension.

1.2.2 Water Demand and Supply Planning Background

The City is vulnerable to water shortages due to its reliance on surface water supplies that are highly susceptible to climate change impacts and the limited storage volume at Loch Lomond Reservoir, which is not sufficient to provide supply reliability during severe or multi-year droughts. Typically, the peak summer season is when the City's water supplies are more limited because flowing water sources are less available due to normal seasonal flow variability and in-stream fish flow requirements. To manage water shortages, the City has primarily relied on calls for curtailment of demand to manage available water supply. Currently, due to the City's already low per capita water demand, achieved

by long-term demand reduction by existing customers through adoption of water use efficiency practices, additional conservation actions that were typically used during water shortage are substantially less effective.

Published in October 2015, the Santa Cruz Water Supply Advisory Committee (WSAC) Final Report on Agreements and Recommendations (WSAC Final Report) provides the City's Water Supply Augmentation Strategy portfolio elements, which include the following:

- **Additional water conservation** with a goal of achieving an additional 200 to 250 million gallons per year of demand reduction by 2035 by expanding water conservation programs.
- **Passive recharge of regional aquifers** by working to develop agreements for delivering surface water to the Soquel Creek Water District and/or the Scotts Valley Water District so they can rest their groundwater wells, help the aquifers recover, and potentially store water for use by the City in dry periods.[1]
- **Active recharge of regional aquifers** by using existing infrastructure and potential new infrastructure for aquifer storage and recovery in the Santa Cruz Mid-County Groundwater Basin, the Santa Margarita Groundwater Basin, or both to store water that can be available for use by the City in dry periods.
- **A potable water supply using advanced-treated recycled water** as its source as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the goals of cost effectiveness, timeliness, or yield. In the event advanced-treated recycled water does not meet the City's needs, seawater desalination would become the supplemental or replacement supply.

More recently, the City's Securing Our Water Future Policy (SOWF Policy), which builds on the WSAC recommendations, indicates that supply augmentation producing at least 500 million gallons a year of additional supply should be completed by 2027 to reduce vulnerability to nearer term droughts. A longer-term water supply reliability goal is identified in the SOWF Policy as the supply required to meet all customer demand under a plausible worst-case condition.

Implementation of the Proposed Project would support WSAC elements involving passive and active recharge as well as supply augmentation as described in the SOWF Policy. Specifically, the Proposed Project would support conjunctive management of surface and groundwater supplies to improve water supply. In general, this involves the storage of water in local aquifers or delivery to regional water agencies during times when water is available, facilitating the return of stored water from the aquifer to the City during droughts or other shortages. Passive and active recharge strategies would involve treating increased volumes of wet season surface water. These wet season waters have additional treatment requirements, due to higher turbidity and more challenging water quality conditions, which the Proposed Project would be able to treat.

1.2.3 Water Quality and Water Treatment Challenges

In operating and maintaining a water system, the City's mission is to ensure public health and safety by providing a clean, adequate, and reliable supply of water. Most of the City's supply comes from flowing water sources – such as rivers and streams. While high quality drinking water begins with actively protecting these flowing water sources, ultimately the delivery of safe drinking water from surface water sources cannot be accomplished without treatment at the GHWTP and management of the drinking water distribution system.

[1] While WSAC recommendations considered only delivering surface water to Soquel Creek Water District and Scotts Valley Water District, current conceptual-level planning considers delivering surface water to San Lorenzo Valley Water District and Central Water District as well.

To ensure that tap water is safe to drink, water treatment is highly regulated at the federal level through the U.S. Environmental Protection Agency (EPA) and at the state level through the State Water Resources Control Board Division of Drinking Water (DDW). Among other requirements, these agencies provide regulations and requirements that establish the maximum concentration of regulated contaminants that can be present in water that complies with drinking water standards and is served by water service providers. Additionally, regulations also provide requirements for use of treatment techniques to ensure removal of harmful pathogens.

A variety of naturally occurring and human-introduced contaminants are regulated and may be present in source waters across California, including source waters treated by the GHWTP. These contaminants may include microbial contaminants; inorganic contaminants such as sediments, salts, and metals; fertilizers, herbicides and pesticides; organic chemical contaminants that are industrial byproducts; microbial contaminants (such as viruses, parasites, protozoa, and bacteria); and total organic carbon (TOC). TOC is often measured as a non-specific indicator of water quality. Water treatment plants such as GHWTP are designed to treat the specific character and condition of the water source feeding the treatment facility. The GHWTP treatment process must be able to respond to a variety of potential contaminants, such as those listed above, to regulatory requirements, and to changing climate conditions.

The GHWTP currently operates under a DDW domestic water supply permit and complies with all applicable drinking water regulations. All water supplied by the City for domestic purposes meets all State and Federal criteria for public health protection. However, the GHWTP faces a number of challenges due to the age of the City's facility, existing water quality, water quality changes due to anticipated climate change impacts, the nature of the City's water distribution network, future expanded treatment of wet season surface water, and anticipated pending and future regulatory changes. While water treated at the GHWTP continues to meet treatment technique requirements and meet or be below established State Drinking Water Standards, the City has invested substantial effort to characterize the water quality from the various supply sources and has identified several source water vulnerabilities. Treatment vulnerabilities include potential future regulations of contaminants of emerging concern (CECs) (e.g., pesticides, pharmaceuticals, endocrine disrupting compounds, personal health care products, and industrial chemicals [such as per- and polyfluoroalkyl substances (PFAS)]) and contaminants for which EPA has collected information under several Unregulated Contaminant Monitoring Rule cycles, and requirements from the City's water supply permit issued by DDW. Specific treatment challenges include disinfection byproduct control; taste and odor control; treatment of microbial contaminants, CECs, and turbidity; and proper disposal of solids. These treatment challenges may be magnified by climate change impacts and wildfire. These treatment challenges and information about how the Proposed Project would address such challenges are further described in Chapter 3, Project Description.

1.2.4 Project Purpose and Objectives

Across the Country underinvestment in critical infrastructure has resulted in aging and inadequate facilities, that are underprepared to respond to the stressors posed by a changing climate and new regulations. For instance, the 1960s era GHWTP has not been substantially improved since the 1980s and is in need of improvements. These improvements would address deficiencies related to the age of the facility and associated design limitations of the GHWTP to respond to stressors posed by a changing climate and new regulations. Consequently, the underlying purpose of the Proposed Project is to provide for a modernized treatment plant that: meets contemporary building, electrical, and fire code requirements; supports the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy; increases the City's treatment reliability; and

improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms, and drought conditions. The objectives for the Proposed Project are as follows:

1. Provide an adaptable water treatment facility, that can readily recover from and/or adjust to changing water quality or other potentially disruptive events by using multiple process tools, operational changes, switching between supply sources, or adjusting flow rates.
2. Provide treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC).
3. Provide treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for treatment of currently unregulated contaminants (e.g., CECs), provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality changes, and flow conditions.
4. Provide flexibility for installation of additional treatment equipment, if warranted, to adapt to future regulations, source water quality and flow conditions.
5. Support the implementation of the City's Water Supply Augmentation Strategy related to passive recharge of regional aquifers via water transfers and exchanges and active recharge of regional aquifers via Aquifer Storage and Recovery [ASR]), and SOWF Policy in order to deliver a safe, adequate, reliable and environmentally sustainable water supply.
6. Rehabilitate existing aging infrastructure to allow reusing and extending its useful life, to the extent feasible, or decommissioning and replacing it.
7. Provide a cost-effective project that optimizes the benefits and total cost of ownership (i.e., life cycle cost) for the City and complete construction at or below the Proposed Project budget.
8. Support the City's effort and policy to apply Health in All Policies (HiAP) approach and equity practices to City decision-making. The HiAP approach includes three pillars: sustainability, equity, and public health. The Santa Cruz Water Department goals under these pillars include:
    a. Sustainability: Support the health of the surrounding environment, implement environmentally superior building materials and designs, reduce energy and water use in municipal buildings, reduce greenhouse gas emissions, and support the development of renewable energy sources.
    b. Equity: Create and foster maximum organizational effectiveness, such as providing responsible financial stewardship, and identifying and engaging a diverse set of potential stakeholders.
    c. Public Health: Preserve and secure reliable water supplies, considering future impacts of climate change and natural hazards to water service reliability and meeting current and foreseeable drinking water standards.
9. Throughout the construction process, maintain production of potable water delivery throughout the City distribution system, without incurring emergency plant shutdowns, permit violations, or exceedances of drinking water standards, due to construction activities.
10. Provide a water treatment facility that meets current seismic, building, fire, and electrical codes; protects buildings in the wildland urban interface, as warranted; and meets DDW permitting requirements.

1.2.5 Project Characteristics

The Proposed Project would replace and substantially upgrade the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities. The Proposed Project would improve the GHWTP to: meet current seismic, building, electrical, and fire code requirements; support the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy; increase the City's treatment reliability to meet current and anticipated future water quality requirements; and improve the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms, and droughts. Numerous water quality regulations would be addressed by the Proposed Project, which are summarized in Chapter 3, Project Description (see Section 3.2.4, Water Quality and Water Treatment Challenges). Characteristics and elements of the Proposed Project include the following:

- **Reliable Water Treatment Plant Capacity.** The Proposed Project would be designed to reliably produce a maximum of 18.2 million gallons per day, under a broad range of source water conditions.
- **New and Upgraded Water Treatment and Related Processes.** The Proposed Project includes process upgrades related to:
  - Pretreatment
  - Treatment
  - Solids handling
  - Chemical feed systems
- **New and Upgraded Buildings.** The Proposed Project would include new and upgraded buildings including:
  - Upgraded Operations and Filter Building
  - New Maintenance Building
  - New Ozone Building
  - New Solids Dewatering Building
  - New Chemical Storage and Feed Building
- **Infrastructure and Site Improvements.** Proposed Project infrastructure and site improvements would include:
  - Sewer improvements
  - Stormwater management improvements
  - Electrical; lighting; heating, ventilation, and air conditioning (HVAC); Supervisory Control and Data Acquisition (SCADA); and alarm improvements
  - Existing natural gas infrastructure would be removed and replaced with electrical infrastructure
  - Vehicular access improvements
  - Screening and landscaping improvements
  - Fencing and site security improvements
- **Project Operations and Maintenance.** Under the Proposed Project, operation and maintenance of the upgraded GHWTP would include many activities largely consistent with current activities, as well as new activities related to the new treatment process and solids dewatering equipment.
- **Project Construction.** The project construction is anticipated to commence in phases over a four-year period (from 2025 through 2029) while maintaining ongoing operations and continuous production of drinking water at GHWTP. The City has identified standard construction practices that would be implemented by the

City and/or its contractors. Additionally, the Proposed Project would implement the applicable avoidance and minimization measures from the City's Low Effect Habitat Conservation Plan and associated Incidental Take Permit under Section 10(A)(1)(B) of the Endangered Species Act.

1.3 Impact Summary

Table 1-1, which is provided at the end of this chapter, 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. The Proposed Project would result in significant and unavoidable project and cumulative construction noise impacts, even with the implementation of Mitigation Measure (MM) NOI-2 that would reduce construction noise level exposures attributed to the Proposed Project.

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 6-2 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. The following alternatives are evaluated in Chapter 6, Alternatives:

1. No Project Alternative – The No Project Alternative are the circumstances under which the Proposed Project does not proceed.
2. Alternate Process Technology Alternative – This alternative involves a similar comprehensive upgrade to the GHWTP using an alternate pretreatment technology called high-rate clarification with ballasted flocculation (also called ballasted clarification).
3. Reduced Capacity Alternative – This alternative involves a comprehensive upgrade of the GHWTP but with a smaller capacity.
4. No Solids Dewatering Alternative – This alternative involves a comprehensive upgrade of the GHWTP with the same capacity as the Proposed Project but with fewer components and specifically, no solids dewatering facilities.

Table 6-2, in Chapter 6, Alternatives, presents a comparison of project and cumulative impacts of the Proposed Project and the alternatives. While the No Project Alternative (Alternative 1) would avoid most of the impacts of the Proposed Project, it would not realize the water supply benefit of the Proposed Project and the water supply impact of the No Project Alternative would be potentially significant and unavoidable until an alternative source of water supply is developed (see Table 6-2). Given that the City's water supply objectives would not be met with the No Project Alternative, the City's likely prioritization and pursuit of recycled water and/or seawater desalination under the City's Water Supply Augmentation Strategy and SOWF Policy could result in some additional impacts that would not result from the Proposed Project. Given this, the No Project Alternative is not the environmentally superior alternative and therefore an environmentally superior alternative among the other alternatives does not need to be identified under CEQA Guidelines Section 15126.6(e)(2).

While not required to identify an environmentally superior alternative among the other alternatives, the City has concluded that Alternative 4 may be the environmentally superior alternative. Alternative 2 would result in greater impacts in some categories and reduced impacts in other categories, compared to the Proposed Project. In particular, Alternative 2 would result in somewhat increased construction noise impacts given that the construction period would be longer and more complex and therefore would increase the significant unavoidable project and cumulative construction noise impact, as compared to the Proposed Project.

While both Alternative 3 and Alternative 4 would result in reduced impacts in all categories, compared to the Proposed Project, Alternative 4 would reduce impacts of the Proposed Project to a greater extent than would Alternative 3. Given that Alternative 4 would have a smaller GHWTP facility footprint, marginally less operational energy use, marginally less construction noise, less operational noise, and less construction and operational traffic, as compared to Alternative 3, Alternative 4 would reduce impacts of the Proposed Project to a greater extent than would Alternative 3. However, neither Alternative 3 or Alternative 4 would avoid the significant unavoidable project and cumulative construction noise impact, as MM NOI-2 would reduce but not likely avoid such an impact.

While Alternative 4 may be environmentally superior to the Proposed Project it may also result in transferring some impacts of the Proposed Project to the WWTF, which may offset some of the environmental benefits of Alternative 4. For example, the marginally less operational energy use associated with Alternative 4, may result in increased energy use at the WWTF to process the Proposed Project's solids. However, until the feasibility of Alternative 4 is determined and evaluated, it is not possible to fully assess the environmental benefits and tradeoffs associated with Alternative 4. See Chapter 6, Alternatives, for additional information.

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. The NOP for the Proposed Project was circulated for a 30-day comment period from June 27, 2022, to July 26, 2022, to determine the scope and extent of environmental issues to be addressed in this EIR. Two agency and public scoping meetings were held on July 19, 2022, on the scope of the EIR's analyses. In response to the NOP, five written comment letters were received during the 30-day comment period: three from individuals and two from agencies. These comment letters are summarized in Table 2-1 of Chapter 2, Introduction, of this EIR.

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; biological resources as related to habitat, stormwater management, and artificial lighting; request to allow public access along the utility corridor portion of the primary project site; wildfire exposure at the GHWTP and wildfire management; operational noise conditions; fence maintenance; and nighttime lighting conditions. 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.

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
Aesthetics			
Impact AES-1: Scenic Vistas. The Proposed Project's construction and operational activities would not eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor	Less than Significant	None	Less than Significant
Impact AES-2: Scenic Quality. The Proposed Project would not substantially degrade the existing visual character or quality of the surrounding area (i.e., be incompatible with the scale or visual character of the surrounding area, or substantially detract from the integrity, character, and/or aesthetic character of the neighborhood.	Less than Significant	None	Less than Significant
Impact AES-3: Light and Glare. The Proposed Project components, including new sources of lighting, new structures, and new materials, would not adversely affect daytime or nighttime views or activities in the area or pose a nuisance.	Less than Significant	None	Less than Significant
Impact AES-4: Cumulative Impacts Related to Aesthetics. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to aesthetics.	Less than Significant	None	Less than Significant
Air Quality			
Impact AIR-1: Conflict with Air Quality Plan. Construction and operation of the Proposed Project would result in emissions of criteria pollutants but would not exceed adopted thresholds of significance and therefore would not conflict with the Monterey Bay Air Resources District's (MBARD's) Air Quality Management Plan (AQMP).	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
Impact AIR-2: Criteria Pollutant Emissions. Construction and operation of 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-3: Exposure of Sensitive Receptors. The Proposed Project would not potentially expose sensitive receptors to substantial pollutant concentrations during short-term construction or during long-term operations.	Less than Significant	None	Less than Significant
Impact AIR-4: Other Emissions Adversely Affecting a Substantial Number of People. Construction and operation of 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-5: Cumulative Air Quality 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 air quality.	Less than Significant	None	Less than Significant
Biological Resources			
Impact BIO-1: Special-Status Species. The Proposed Project would have no impact on special-status	Potentially Significant	**MM BIO-1: Special-Status Amphibian and Reptile Species Survey and Monitoring (applies only to the Utility Corridor, if**	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
plants but could have a substantial adverse effect on some special-status wildlife species during construction.		**stormwater improvements are implemented).** 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 San Lorenzo River). The survey area shall include all suitable habitat within the work areas, plus a 50-foot buffer. Following the survey, the contractor, under the direction of a qualified biologist, shall install wildlife exclusion fencing along the boundary of the work area containing suitable habitat to prevent special-status amphibians and reptiles from entering the work area. The wildlife exclusion fencing 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. Turnarounds shall be installed at access points to direct amphibians and reptiles away from gaps in the fencing. **MM BIO-2: Biological Construction Monitoring (applies to entire project site and staging areas).** A qualified biologist shall monitor vegetation removal and initial ground disturbing activities during all work hours for off-pavement work where special-status wildlife species are likely to occur. The frequency and characteristics of monitoring will be determined by the qualified biologist during the implementation of MM BIO-1 and MM BIO-4. The monitor shall check any wildlife exclusion fencing installed at the utility corridor along the San Lorenzo River and any avoidance buffers for nesting birds once a week and verify when birds have fledged if found present before construction. The biologist shall have stop-work authority in the event that a listed species is found within the active construction footprint. During construction, the biological monitor shall keep a daily	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		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 and made available for inspection by agency personnel. **MM BIO-3: Species Relocation (applies to entire project site and staging areas).** If special-status wildlife species are observed within the construction area prior to or during construction activities, the biologist shall capture and relocate such individuals out of the area affected by construction activities to nearby habitat that has equivalent value to support the species. The biologist shall identify suitable habitats as potential release sites prior to start of construction activities. If the special-status species is a federally or state-listed as threatened or endangered, the biologist shall notify the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and/or National Marine Fisheries Service, as appropriate, prior to capture and relocation to obtain approval, if not already covered by an existing incidental take permit. **MM BIO-4: Surveys for San Francisco Dusky-Footed Woodrat (applies to entire project site and staging areas).** A pre-construction survey for San Francisco dusky-footed woodrat middens shall be conducted within 14 days of the start of construction. During the survey, a qualified biologist shall identify any middens in the work area and contiguous habitat within 10 feet and determine if they are active using peer-accepted methods (e.g., mimicking woodrat "tail rattle" and listening for a response). If the biologist determines that the middens are unoccupied, no further action is required. If the biologist determines that the middens are occupied or potentially occupied and that project activities could result in	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		woodrat mortality, the following measures shall be implemented: A. The contractor, under direction of the biologist, shall install a 10-foot-radius exclusion zone around each midden using pin flags, orange safety cones, wood lathe, or similar material in which no activity would occur until project construction is complete. B. If middens cannot be avoided by this buffer, the contractor, under direction of the biologist, shall dismantle the middens by hand or using small machinery and move the woody materials to similar habitat outside the project footprint. The midden dismantling activities shall only occur in the early morning during the non-breeding season (October to February), however, so that any adults or non-dependent young can escape into adjacent habitat during the dismantling activity.	
Impact BIO-2: Riparian Habitat or Sensitive Natural Communities. The Proposed Project would not have a substantial adverse effect on riparian habitat or sensitive natural communities.	Less than Significant	None	Less than Significant
Impact BIO-3: State or Federally Protected Wetlands or Waters. The Proposed Project could have a substantial adverse effect on state or federally protected wetlands or waters.	Potentially Significant	**MM BIO-5: Aquatic Resource Delineation and Mitigation (applies only to the Utility Corridor, if stormwater improvements are implemented).** To clarify the extent of state and federally protected wetlands and waters regulated by the U.S. Army Corps of Engineers, Regional Water Control Board, and California Department of Fish and Wildlife within the utility corridor area along the San Lorenzo River, a qualified aquatic resource delineator shall conduct a formal jurisdictional delineation within the impact area. The results of the delineation would be used to calculate temporary and permanent impacts for reporting to the above agencies in	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		respective permitting applications and determine the appropriate amount of compensatory mitigation for unavoidable impacts. All jurisdictional aquatic resources not directly affected by construction activities shall be avoided and protected by establishing staking, flagging or fencing between the identified construction areas and aquatic resources to be avoided/preserved. For unavoidable impacts to jurisdictional aquatic resources, a project-specific mitigation plan shall be developed, approved by the above agencies, 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 (in-kind mitigation at a minimum mitigation ratio of 1:1); 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 stands are not achieved.	
Impact BIO-4: Native Wildlife Nursery Sites. The Proposed Project would not impede the use of	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
native wildlife nursery sites by removing or causing abandonment of active native bird nests.			
Impact BIO-5: Fish or Wildlife Species Habitat or Population Levels. The Proposed Project would not substantially reduce fish or wildlife species habitat or cause a fish or wildlife population to drop below self-sustaining levels.	Less than Significant	None	Less than Significant
Impact BIO-6: Cumulative Biological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact related to biological resources, but the Proposed Project's contribution to this impact would not be cumulatively considerable.	Less than Significant	None	Less than Significant
Cultural Resources and Tribal Cultural Resources			
Impact CUL-1: Historical (Built Environment) Resources. The Proposed Project would not cause a substantial adverse change in the significance of historical built environment resource, pursuant to Section 15064.5.	Less than Significant	None	Less than Significant
Impact CUL-2: Archaeological Resources and Human Remains. The Proposed Project would not cause a substantial adverse change in the significance of unique archaeological resources (pursuant to Section 15064.5) 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: 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

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact CUL-4: Cumulative Cultural Resources and Tribal Cultural 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 cultural resources and tribal cultural resources.	Less than Significant	None	Less than Significant
Energy			
Impact ENE-1: 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
Impact 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
Impact 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 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	None	Less than Significant
Impact GEO-2: Landslides. The Proposed Project would not cause potential substantial adverse	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
effects involving landslides, including the risk of loss, injury, or death.			
Impact GEO-3: Unstable Geologic Unit or Soils. The Proposed Project would not 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	None	Less than Significant
Impact GEO-4: Expansive Soils. The Proposed Project would potentially be located on expansive soil, as defined in the 2022 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-5: 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-1: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring (applies to the GHWTP Parcel and the Alternate Sanitary Sewer Lateral Replacement Area).** Prior to commencement of any ground disturbance below artificial fill and Holocene alluvial or colluvial deposits with the potential to impact Pleistocene terrace deposits or the Santa Margarita Formation sandstone within the project site, the City shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (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	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		and discoveries treatment; paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils); reporting; and collections management. A qualified paleontologist shall attend a preconstruction meeting and a qualified paleontological monitor shall be on site during ground-disturbing activities below fill and Holocene alluvial and/or colluvial deposits. where there is the potential to impact Pleistocene terrace deposits or the Santa Margarita Formation sandstone. 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 or an appropriately sized buffer as determined by the qualified paleontologist. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.	
Impact GEO-6: 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-7: 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

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
Greenhouse Gas Emissions			
Impact GHG-1: Greenhouse Gas Emissions. The Proposed Project would not generate GHG 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 GHG 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 GHG Impacts. 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	None	Less than Significant
Hazards and Hazardous Materials			
Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials. Construction and operation of the Proposed Project would require routine use and transportation of hazardous materials but would not result in a significant hazard to the public or environment. Demolition, construction, and excavation activities have the potential to create a significant hazard to the public or environment due to the improper handling, transportation, and disposal of hazardous building materials and impacted soils.	Potentially Significant	**MM HAZ-1: Evaluation and Treatment of Concrete Mortar (Applies to Existing Storm Drain Line within the Utility Corridor).** Prior to removal or modification of the existing onsite steel stormwater piping, the concrete mortar will be evaluated for the presence of asbestos. The evaluation will include a survey of the pipeline and appurtenances for the potential presence of asbestos in concrete mortar; this survey will be conducted by a California-licensed asbestos contractor. If necessary, bulk samples will be collected of suspect material for further analysis at a California-licensed analytical laboratory. Any concrete mortar that contain asbestos above applicable regulatory levels will be either be properly abated in accordance with rules and regulations	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		applicable for asbestos removal and disposal, or maintained in place with protections that limit potential exposure to asbestos piping. Asbestos containing materials are defined under federal and state regulations as 1.0% by volume. **MM HAZ-2: Soil Management Plan (Applies to the GHWTP Parcel).** A soil management plan (SMP) will be prepared and implemented for management of arsenic-impacted soils that are encountered during construction and excavation activities of the Proposed Project. The SMP will outline soil handling, testing, and disposal requirements, and will follow recommendations outlined in the Contaminated Soils and Groundwater Technical Memorandum. The SMP will also include health and safety procedures for onsite workers, transportation requirements, dust control techniques, and monitoring and reporting requirements. The SMP and subsequent soil removal work will be overseen by an environmental remediation professional with experience in contaminated soil removal and disposal. Records of removal and final disposition of soil, including but not limited to analytical reports, trucking logs, onsite monitoring and field logs, and dump receipts, will be maintained by the City. Soils that are not disturbed during construction and are located beneath buildings or asphalt are not required to be removed.	
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	None	Less than Significant
Impact HAZ-3: Interfere with Emergency Response Plans. The Proposed Project would not impair	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
implementation of or physically interfere with existing emergency response plan or emergency evacuation plan.			
Impact HAZ-4: Cumulative Hazard Impacts. 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.	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 or groundwater quality. 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	None	Less than Significant
Impact HYD-2: Decrease Groundwater Supplies, Interfere with Groundwater Recharge, or Conflict with Groundwater Plan. Construction and operation of the Proposed Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that sustainable groundwater management of the basin would be impeded or such that conflict or obstruction of a sustainable groundwater management plan would occur.	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
Impact HYD-3: Alteration to the Existing Drainage Pattern of the Site Area. Construction and operation of 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: (a) result in substantial erosion or siltation on or off site; (b) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; (c) 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 (d) impede or redirect flood flows.	Less than Significant	None	Less than Significant
Impact HYD-4: Flood, Tsunamis, and Seiche Zones. Construction and operation of the Proposed Project in flood hazard, tsunami, or seiche zones would not risk release of pollutants due to project inundation	Less than Significant	None	Less than Significant
Impact HYD-5: Cumulative Hydrology and Water Quality 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 surface water hydrology and water quality.	Less than Significant	None	Less than Significant
Land Use and Planning			
Impact LU-1: Conflicts with Land Use Plans, Policies, or Regulations. Construction and operation of the Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the	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
purpose of avoiding or mitigating an environmental effect.			
Impact LU-2: Cumulative Land Use and Planning 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 conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Less than Significant	None	Less than Significant
Noise and Vibration			
Impact NOI 1: Substantial Permanent Increase in Ambient Noise Levels. The Proposed Project could result in a substantial permanent increase in noise levels in the project vicinity above ambient levels without the project.	Potentially Significant	**MM NOI-1: Operational Mechanical and Process Noise (applies only to the GHWTP).** The Proposed Project shall implement the following measures to minimize operational, mechanical and process noise levels through project site design; selection of low noise generating equipment; and use of silencers/mufflers, localized barriers, extended parapets, mechanical screens, and acoustical absorption, as outlined below. One or more of the following measures shall be incorporated into project site design to yield aggregate Proposed Project operational noise levels that are consistent with quantified County absolute and relative thresholds (see Table 4.12-9), as measured at the nearest sensitive receptor: ▪ As consistent with manufacturer performance requirements or guidance, all operating mechanical equipment with the potential to contribute to the generation of excessive offsite noise exposure levels shall be fitted with intake and exhaust silencers, gas vent silencers, shrouds, or acoustical enclosures.	Less than Significant

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		▪ To exploit interior-to-exterior sound transmission losses associated with a building exterior shell (and its inherent material assemblies and penetrations for access, natural lighting, and ventilation or exhaust), mechanical equipment shall be located within the associated building. Building penetrations such as fresh air intakes and exhausts shall be fitted with acoustical louvers. ▪ Noise generating equipment not located within a building or within adjacent service yards incorporating acoustical barriers shall be shielded from direct line-of-site to nearby noise-sensitive uses through the use of localized noise barriers, rooftop parapets, sound rated mechanical screens or intervening structures. ▪ Mechanical equipment not located within a building or an acoustically rated enclosure capable of reducing exterior noise level exposures consistent with applicable thresholds, as specified above, shall be located at a sufficient distance from nearby noise-sensitive receptors, so that mechanical equipment would be reduced to be consistent with the applicable thresholds.	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		A noise level monitoring program shall be developed and implemented by the City to verify that noise levels produced by equipment associated with on-going operations of the facility achieve consistency with applicable threshold levels at nearby noise-sensitive land uses. The monitoring program shall be conducted initially after full operations are underway and subsequently, if noise complaints are received and directly attributable to the new equipment. If monitored noise levels exceed the applicable threshold levels at nearby noise-sensitive land uses, potential additional treatments shall be implemented including but not limited to adding additional mass to building shells, installing acoustic absorption within a building, and/or installing enclosures around specific pieces of equipment, such that consistency with applicable threshold levels at nearby noise-sensitive land uses is achieved.	
Impact NOI-2: Substantial Temporary or Permanent Increase in Ambient Noise Levels in Excess of Applicable Standards. The Proposed Project would result in substantial noise levels in the vicinity of the project, in excess of standards established in the local general plan, noise ordinance or applicable standards of other agencies.	Potentially Significant	**MM NOI-2: Construction Noise (applies to the entire project site and staging areas).** 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 a 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, efficient construction progress, and/or to account for prior construction delays outside of a contractor's control (e.g., weather delays).	Significant Unavoidable

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		▪ Construction activities requiring operations to continue outside of the hours of 8:00 AM to 5:00 PM 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 yield construction noise exposure levels that are at or below either the 60 dBA nighttime (10:00 PM to 8:00 AM) or 75 dBA daytime (5:00 PM to 10:00 PM) County code standards at the nearest offsite sensitive receptors. Noisy construction equipment, such as temporary pumps that are not submerged, aboveground conveyor systems, concrete saws, and impact tools will likely require location within such an acoustically rated enclosure, shroud, or barrier to meet these 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. ▪ 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 allow proper fit, function, and minimization of noise.	

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		▪ 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. ▪ In conjunction with the implementation of standard construction practice #17, the Construction Noise Coordinator shall manage complaints resulting from construction noise by instituting modifications to the construction operations, construction equipment or work plan to ensure consistency with the County Code standards that apply from 5:00 PM to 8:00 AM, where complaints are verified and substantive. Recurring disturbances shall be evaluated by a qualified acoustical consultant retained by the City to provide for consistency with applicable standards.	
Impact NOI 3: Excessive Groundborne Vibration or Noise Levels. Construction of the Proposed Project would not 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 and Vibration Impacts. Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact; however, construction vibration would not result in significant cumulative impact. Operation of the Proposed Project would also not result in a significant cumulative impact related to noise.	Potentially Significant	None	Significant Unavoidable
Transportation			
Impact TRA-1: Conflict with Program, Plan, Ordinance, or Policy Addressing the Circulation	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
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.			
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 that exceeds City and County thresholds (greater than 15% below the regional average VMT).	Less than Significant	None	Less than Significant
Impact TRA-3: Geometric Design. Construction and operation of the Proposed Project would not result in substantial increases in hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.	Less than Significant	None	Less than Significant
Impact TRA-4: Emergency Access. Construction and operation 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-5: Cumulative Transportation Impacts. 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	None	Less than Significant
Utilities and Service Systems			
Impact UTL-1: New or Expanded Facilities. The Proposed Project would not result in new or expanded water, wastewater treatment, stormwater	No Impact	None	No Impact

Table 1-1. Summary of Project Impacts

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
drainage, electric power, natural gas, or telecommunications facilities beyond those proposed as part of the Proposed Project and evaluated throughout the EIR.			
Impact UTL-2: Water Supplies. Operation of the Proposed Project would provide sufficient water supplies to serve the Proposed Project and would support the provision of sufficient water supplies for reasonably foreseeable future development during normal, dry, and multiple dry years.	Beneficial	None	Beneficial
Impact UTL-3: Solid Waste Generation. Construction and operation of the Proposed Project would not generate solid waste in excess or state or local standards, or of the capacity of local infrastructure, or impair attainment of solid waste reduction goals.	Less than Significant	None	Less than Significant
Impact UTL-4: Compliance with Solid Waste Regulations. Construction and operation of the Proposed Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	Less than Significant	None	Less than Significant
Impact UTL-5: Cumulative Water and Wastewater 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 water supply and wastewater treatment.	Less than Significant	None	Less than Significant
Impact UTL-6: Cumulative Landfill 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 landfill	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
capacity or related to compliance with solid waste regulations.			
Wildfire			
Impact WIL-1: Wildland Fire Exposure. 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: Pollutant Concentrations from Wildfire. The Proposed Project would not, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Proposed Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.	Less than Significant	None	Less than Significant
Impact WIL-3: Installation or Maintenance of Infrastructure. The Proposed Project would not 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.	Less than Significant	None	Less than Significant
Impact WIL-4: Runoff, Post-Fire Slope Instability or Drainage Changes. The Proposed Project would not expose people or structures to significant risks, including downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	Less than Significant	None	Less than Significant
Impact WIL-5: Cumulative Wildfire Impacts. The Proposed Project, in combination with past,	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
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.			

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2 Introduction

2.1 Purpose of the EIR

This environmental impact report (EIR) has been prepared for the City of Santa Cruz (City), which is the lead agency for the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). Climate Resilient Santa Cruz is an ongoing initiative of the City of Santa Cruz that aims to respond to anticipated future impacts from climate change. 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 Process.

2.2 Scope of the EIR

A Notice of Preparation (NOP) was published in June 2022 for the Proposed Project to determine the scope and extent of environmental issues to be addressed in this EIR and is 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 agriculture and forest resources, mineral resources, population and housing, public services, and recreation.

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:

- Aesthetics
- 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
- Land Use and Planning
- Noise and Vibration
- Transportation
- Utilities and Service Systems
- 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.

2.3 Environmental Review and Approval Process

2.3.1 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 June 27, 2022, to July 26, 2022. 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. Two virtual public scoping meetings were held on July 19, 2022, from 3:30 to 4:30 PM and from 5:30 to 6:30 PM[1]; the corresponding presentation about the Proposed Project was posted on the City's website at https://www.cityofsantacruz.com/government/city-departments/water/online-reports/environmental-documents.

Five written comment letters were received during the 30-day comment period: three from individuals and two from agencies. These letters are 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.

[1] The second of the two virtual public scoping meetings had no attendees and therefore was completed before 6:30 PM.

Table 2-1. Scoping Comment Summary

Summary of Comment	EIR Section Considered
Native American Heritage Commission (NAHC) – June 24, 2022	
Description of regulations requiring consultation with Native American tribes and recommendation to initiate consultation as early as possible.	Section 4.5, Cultural and Tribal Cultural Resources
Examples of mitigation measures that may be considered to address potential tribal cultural resource impacts.	Section 4.5, Cultural and Tribal Cultural Resources
List of NAHC recommendations for cultural resources assessments.	Section 4.5, Cultural and Tribal Cultural Resources
California Department of Fish and Wildlife (CDFW) – Bay Delta Region – July 22, 2022	
Include complete descriptions of the following Project features in the EIR Project Description: ▪ Footprints of permanent Project features and temporarily impacted areas. ▪ Areas and plans for proposed buildings/structures, ground disturbing activities, fencing, paving, stationary machinery, landscaping, and stormwater systems. ▪ Operational features of the Project, including level of anticipated human presence, artificial lighting/light reflection, noise, traffic generation, and other features. ▪ Construction schedule, activities, equipment, and crew sizes.	Chapter 3, Project Description
Description of regulatory requirements for the Project, related to the California Endangered Species and Native Plant Protection Act, Lake and Streambed Alteration, Nesting Birds, and Fully Protected Species.	Section 4.4, Biological Resources
Recommends that the EIR provide habitat assessments for special-status species potentially located in and surrounding the Project area to use in assessing which special-status species are likely to occur in the Project area.	Section 4.4, Biological Resources
States that the EIR analysis should discuss all direct and indirect impacts that my occur with implementation of the Project, including: ▪ Encroachments into riparian habitats, drainage ditches, wetlands, or other sensitive areas. ▪ Potential for impacts to special-status species or sensitive natural communities. ▪ Loss or modification of breeding, nesting, dispersal, and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features. ▪ Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic, or human presence. ▪ Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features. Comment also provides a list of special-status species from the California Natural Diversity Database (CNDDB) within a 5-mile radius of the Project site, and states the EIR should include measures to ensure avoidance of these species.	Section 4.4, Biological Resources
Recommends that stormwater runoff be dispersed rather than concentrated to a stormwater outfall or other receiving waters. Recommends implementation of low impact development (LID), bioswales, bioretention swales, and incorporation of permeable surfaces throughout the Project site.	Chapter 3, Project Description Section 4.10, Hydrology and Water Quality

Table 2-1. Scoping Comment Summary

Summary of Comment	EIR Section Considered
Recommends eliminating all non-essential artificial lighting. Recommends avoiding or limiting the use of artificial lighting during dawn and dusk hours, when wildlife species are most active. Recommends that outdoor lighting be shielded, cast downward, does not spill onto other properties or upwards into the night sky, and limited to warm light colors with an output temperature of 2700 kelvin or less.	Section 4.3, Aesthetics, Section 4.4., Biological Resources
Recommends the Project incorporates a riparian buffer zone to limit development and vegetation clearing outside of the riparian area. Recommends at least a 50-foot riparian buffer as measured from the top of streambank to the nearest Project infrastructure.	Section 4.4, Biological Resources
Colin A. Mackenzie – July 4, 2022	
Request for the lead agency to use a more succinct writing style.	Chapter 1, Summary, provides a more succinct description of the Proposed Project and conclusions of the EIR.
Casey KirkHart – July 5, 2022	
Request to allow public access to the Pipeline Corridor as a connector for pedestrian and cyclists between Ocean Street Extension and Graham Hill Road.	Beyond the scope of the Proposed Project and EIR.
Eric Poppen – July 17, 2022	
Request that solar power and battery storage be incorporated into the Project design.	Chapter 4.6, Energy and Chapter 4.8, Greenhouse Gas Emissions
Remarks that there are two levels of wildfire exposure at the GHWTP, including: direct radiant heat and ember attack from hot brands. Recommends the hazards be addressed with a reduced fuel zone between buildings. Request to include neighbors in selective vegetation thinning efforts to maintain screening and break up canopy in areas that improve sight lines.	Where applicable to the Proposed Project and EIR, this comment is considered in Section 4.15, Wildfire
States the desire that the Project would improve operational noise conditions. Request to limit garbage collection noise.	Section 4.12, Noise and Vibration
Request that the lead agency replace common fence shared between the commenter and the GHWTP with fencing that would limit pedestrian access between the two properties.	Beyond the scope of the Proposed Project and EIR.
Request for the Project to use light shrouds to improve nighttime lighting conditions.	Chapter 3, Project Description, Section4.3, Aesthetics
Request for downhill flow connection of sewage for homes on Mosswood Court that are on pit type septic systems to facilitate sewage disposal to mitigate any environmental concerns about these adjacent systems.	Beyond the scope of the Proposed Project and EIR.

2.3.2 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 60-day public review period from December 7, 2023, through February 5, 2024.

The Draft EIR will be available for public review during the comment period at the following locations:

- Online at https://www.cityofsantacruz.com/government/city-departments/water/online-reports/environmental-documents.
- City of Santa Cruz Water Department Engineering Counter, located at 212 Locust Street, Suite C in Santa Cruz. Please note that counter hours for the public are Monday through Friday, 1:00 PM to 3:00 PM. Interested parties may call 831.420.5210 or email the Water Engineering Section at waterengineering@santacruzca.gov to schedule an appointment outside of those hours.
- A hard copy of the Draft EIR is also available at the Santa Cruz Public Library 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

Written comments on this Draft EIR may be submitted to the City of Santa Cruz at the address below or by email to Jessica Martinez-McKinney:

Jessica Martinez-McKinney, Associate Planner II
City of Santa Cruz Water Department
212 Locust Street, Suite C
Santa Cruz, California 95060
jmartinezmckinney@santacruzca.gov

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. Two public meetings will be held to provide information on the Proposed Project and the Draft EIR, and to solicit written comments on the Draft EIR. The first meeting will be in-person and held on January 17, 2024, at 5:30 PM at the Santa Cruz Police Department Community Room located at 155 Center Street, in Santa Cruz. The second meeting will be virtual and held on January 18, 2024 at 3:30 PM. Both meetings will present identical content. As the dates for the meetings approach, additional details will be posted online at: https://www.cityofsantacruz.com/government/city-departments/water/online-reports/environmental-documents.

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."

2.3.3 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. Before making a final decision, the City Council will receive recommendations from the Water Commission regarding EIR certification and from the Planning Commission regarding the Proposed Project entitlements. See Chapter 3, Project Description, for additional information about Proposed Project approvals.

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 approve 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.

2.3.4 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.

2.4 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 discretionary permit authority over the Proposed Project may also consider the EIR in making their approvals. See Chapter 3, Project Description, for a complete list of permits and approvals that apply to the Proposed Project.

2.5 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 at the end of each 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, Environmental Setting, 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 an overview of the cumulative projects considered in the analysis, 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.
- **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. The following appendices are attached to this EIR:
  - **Appendix A** - Notice of Preparation and Scoping Comments
  - **Appendix B** - Treatment Goals for the Proposed Project
  - **Appendix C** - Air Quality, Greenhouse Gas, Energy, and Health Risk Assessment Assumptions and Model Outputs
  - **Appendix D** - Biological Resources Existing Conditions Report
  - **Appendix E** - Cultural Resources Inventory and Evaluation Report
  - **Appendix F** - Noise Existing Conditions Report
  - **Appendix G** - Noise and Vibration Modeling Results

3 Project Description

This chapter provides a detailed description of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project) and includes information about project location, project background, project purpose and objectives, and project characteristics. Climate Resilient Santa Cruz is an ongoing initiative of the City of Santa Cruz that aims to respond to anticipated future impacts from climate change.

3.1 Project Location

The Proposed Project would primarily be constructed and located at the City of Santa Cruz's (City) existing GHWTP, located within City limits; however, the parcel is non-contiguous to the City and hence constitutes an "island annexation" surrounded by parcels of residential property in the unincorporated County. Additionally, the Proposed Project is anticipated to involve activities outside of the GHWTP for the purposes of temporary construction staging and potential utility and traffic safety improvements. These activities would occur in both City and County of Santa Cruz (County) jurisdictions. The Proposed Project is anticipated to be located at four sublocations of the primary project site, and construction would be supported using two staging areas, which together constitute the project site (see Figures 3-1, 3-2, and 3-3. The project site locations include:

- Primary Project Site – The approximately 17.1-acre primary project site consisting of:
  - ***GHWTP Parcel.*** The approximately 12.4-acre City-owned GHWTP parcel located at 715 Graham Hill Road in Santa Cruz, CA 95060 on Assessor's Parcel Number (APN) 060-141-05. This area is the site of the existing GHWTP.
  - ***Utility Corridor.*** The approximately 0.2-acre, 550-linear-foot utility corridor between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension and a 15-foot right-of-way on APN 060-151-05. This area contains the existing underground 18- to 24-inch storm drain line, dedicated to the GHWTP, that discharges directly to the San Lorenzo River.
  - ***Graham Hill Road Right-of-Way.*** Approximately 2.3 acres, 1,620 linear feet of the Graham Hill Road public right-of-way between just north of Mosswood Court and just south of Lyle Way. This area contains a segment of the County's existing 12-inch gravity sewer in Graham Hill Road and other existing utilities.
  - ***Alternate Sanitary Sewer Lateral Replacement Area.*** The approximately 2.2-acre alternate sanitary sewer lateral replacement area from the southwest corner of the GHWTP parcel at Ocean Street Extension and along Ocean Street Extension for approximately 4,500 linear feet to the City Public Works Department maintained sanitary sewer connection at Graham Hill Road. This area contains a segment of the City's existing 4-inch sewer lateral located in Ocean Street Extension.
- Staging Areas –
  - ***Mt. Hermon Road Staging Area.*** The approximately 5.1-acre staging area for the Proposed Project located at the northern intersection of Graham Hill Road and Mt. Hermon Road, in Felton, CA at APN 071-201-43.
  - ***Ocean Street Extension Staging Area.*** The approximately 1.9-acre staging area for the Proposed Project located at 1941 Ocean Street Extension at APN 008-031-16.

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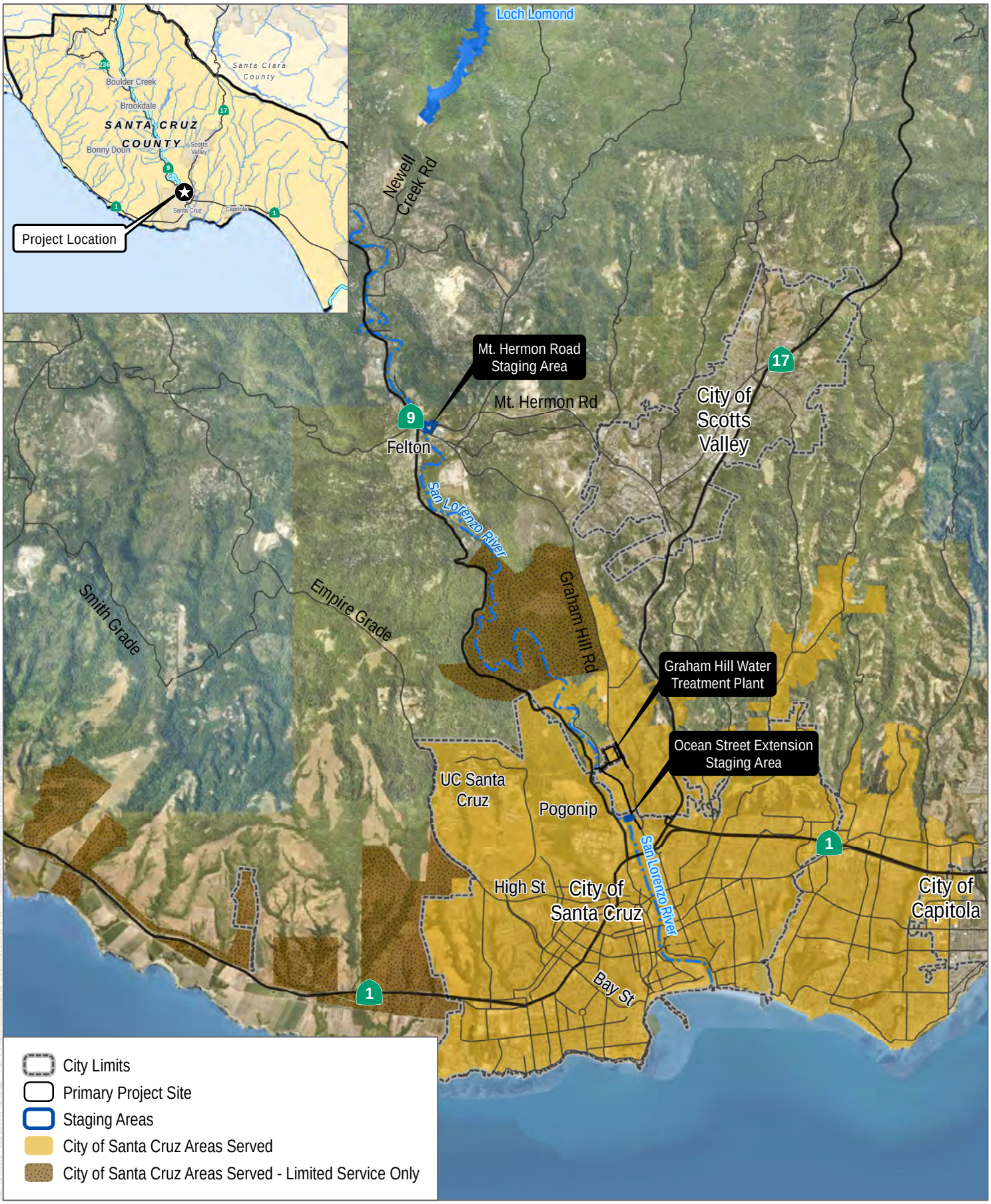

SOURCE: ESRI 2020, City of Santa Cruz 2020

DUDEK

0 3,750 7,500 Feet

FIGURE 3-1

Project Site and Vicinity

Graham Hill Water Treatment Plant Facility Improvements Project

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SOURCE: Bing Maps 2021, County of Santa Cruz 2021, AECOM 2022, W.M. Lyles Co. 2022

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0 135 270 Feet

FIGURE 3-2

Existing GHWTP Site Layout

Graham Hill Water Treatment Plant Facility Improvements Project

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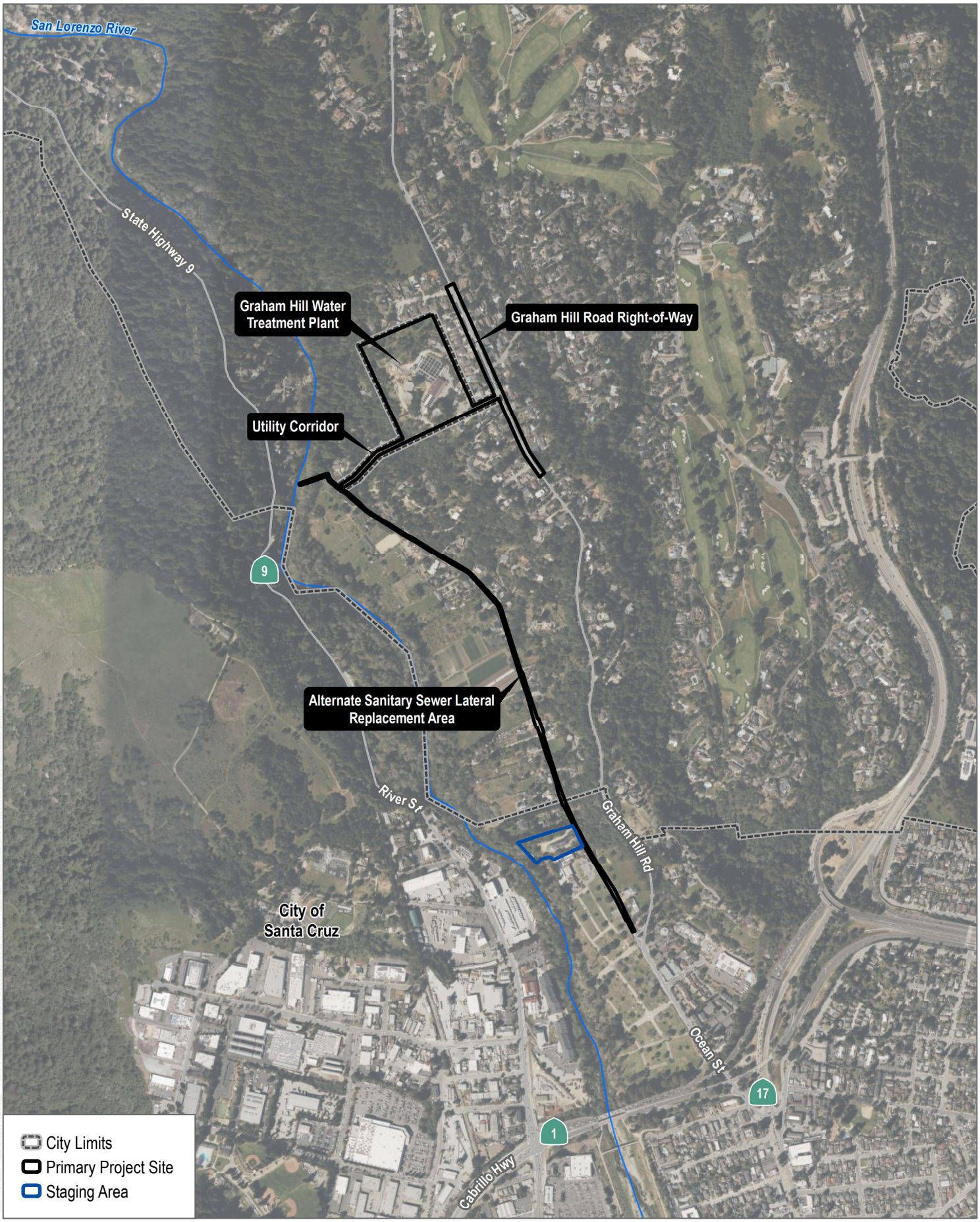

SOURCE: Bing Maps 2022

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0 500 1,000 Feet

FIGURE 3-3

Primary Project Site Components

Graham Hill Water Treatment Plant Facility Improvements Project

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The GHWTP parcel at the primary project site is generally accessed from the south on Graham Hill Road via Ocean Street off State Route 1 (locally referred to as Highway 1). The primary project site may also be accessed from the north on Graham Hill Road via Sims Road or Mt. Hermon Road off State Route 17 (locally referred to as Highway 17).

Single-family residential land uses surround the GHWTP Parcel on the northern, eastern, and southern perimeters. Dense tree canopy and vegetation, and scattered residential dwellings are located beyond the western perimeter on a hillside that slopes down to the San Lorenzo River, approximately 0.3 miles to the west of the primary project site.

3.2 Project Background

3.2.1 City of Santa Cruz Water Supply System

The City provides drinking water to residents of the City and surrounding areas.[1] The City serves approximately 28,000 connections in an approximately 20-square-mile area (see Figure 3-4), which includes the City, adjoining unincorporated areas of the County, and a portion of the City of Capitola. The City also provides drinking water to a limited number of customers along the north coast, primarily along State Highway 1 up toward Bonny Doon Road. The population served by the City is approximately 98,000 persons. The City's annual average water production is 7.8 million gallons per day (mgd), and ranges from approximately 5 to 7 mgd during the winter to approximately 7 to 10 mgd during the summer.

The City's water supply system relies primarily on water from surface water sources, including two diversions on the San Lorenzo River (the Felton Diversion in Felton and the Tait Street Diversion in the City) and four diversions on local North Coast streams (Laguna Creek, Reggiardo Creek, Liddell Spring, and Majors Creek). Production from the Tait wells (groundwater wells under the direct influence of surface water) supplements water from the Tait Street Diversion. The City stores water in Loch Lomond Reservoir in Ben Lomond, which is formed by Newell Creek Dam (also referred to as Newell Creek Diversion). With a total storage capacity of 2.8 billion gallons, Loch Lomond Reservoir helps meet dry-season water demand and provides a backup supply during winter storms that make river diversions problematic due to concerns over water quality and turbidity.[2] Collectively, these surface water sources make up approximately 95% of the annual supply. That amount is supplemented with groundwater wells in the Santa Cruz Mid-County Groundwater Basin (referred to as "Beltz wells") in the unincorporated portion of the County. Figure 3-4 illustrates the locations of the City's existing water supply facilities and sources.

The City, like other water suppliers in the County, has no imported water supply from outside of Santa Cruz County. Due to limited water supply and storage, the City faces inadequate water supply during multi-year drought years.

1 The City owns and operates a water system that diverts and serves water both within the City limits and outside of those limits. References to the City's water system, rights, and supplies, therefore, refer to areas both inside and outside of the City limits.

2 Turbidity refers to the clarity or cloudiness of water, which can be impacted by materials such as clay, silt, and algae for example. Higher concentrations of particulate matter in water increase turbidity.

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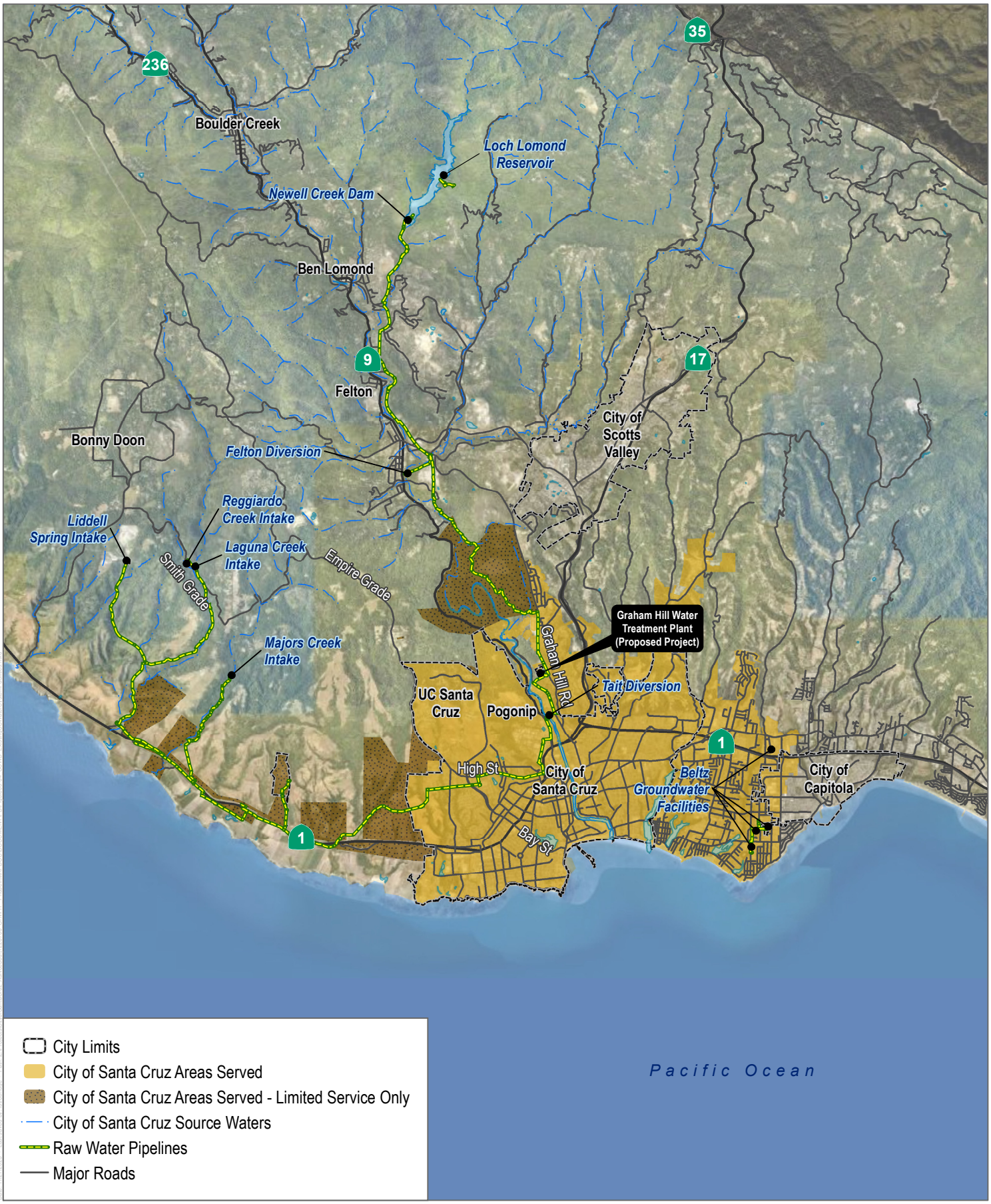

SOURCE: ESRI 2020, City of Santa Cruz 2020

DUDEK

0 1 2 Miles

FIGURE 3-4

Existing City of Santa Cruz Water System Facilities and Sources

Graham Hill Water Treatment Plant Facility Improvements Project

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3.2.2 Water Demand and Supply Planning Background

Long-term water demand forecasts are typically developed at least every five years for incorporation into the City's state-required urban water management plan (UWMP). The forecast developed for the 2020 UWMP projected water demand to increase at a very slow rate, from 2.6 billion gallons per year in 2020 to about 2.8 billion gallons per year in 2045 (City of Santa Cruz 2021a). Due to the significant anticipated development of housing in the City's water service area, the City updated the long-term demand forecast in 2023. The updated forecast projected that demand in 2045 will be approximately 100 million gallons per year higher than the forecast completed for the 2020 UWMP, for an updated demand projection of 2.9 billion gallons per year in 2045 (M.Cubed 2023). Specifically, the projected increased demand is due to higher projected rates of multifamily residential and accessory dwelling unit construction.

Over the last two decades the City's long-term water demand has steadily declined and since 2016 the demand has stabilized. The City's water demand peaked in 2000 at about 4.5 billion gallons per year. However, by 2013 the City's water demand had dropped to 3.2 billion gallons per year. During the 2014 – 2015 drought period water rationing for residential customers was imposed causing demand to fall precipitously to 2.5 billion gallons per year. Since 2016 water demand has stabilized at about 2.6 billion gallons per year. While many factors including the increase in marginal cost of water service and water conserving plumbing retrofits, have influenced customer water use, it is clear that City water service customers have fully embraced water use efficiency behaviors, technologies, and practices. Current City customer residential water demand is stable at 44 gallons per capita per day for residential indoor and outdoor use and 35 gallons per capita per day for indoor use only (City of Santa Cruz 2022). The downside of low per capita water use is that water use is now so efficient that calls for reductions during drought conditions are substantially less effective than they were when curtailments were historically used as a major tool to mitigate the City's significant vulnerability to drought conditions.

Santa Cruz has a long-standing supply reliability problem that has resulted in the routine use of water curtailments imposed on customers. The cause of the supply reliability problem is inadequate dry season storage. This problem has been recognized and worked on over many decades, with the most recent effort being initiated following a decision in 2013 not to pursue a local regional desalination plant in collaboration with the Soquel Creek Water District. To set a new direction the Council appointed a diverse 14-member Water Supply Advisory Committee (WSAC)[3] to work together to confirm the cause(s) and size of the water supply reliability problem and to develop a community supported plan to address the problems identified.

In October 2015, the WSAC reached consensus and approved its Final Report on Agreements and Recommendations [WSAC Final Report] that included a detailed problem statement, acknowledged that the City's supply reliability issue is being exacerbated by the effects of climate change, particularly those related to longer and more frequent droughts, and confirmed that the supply reliability problem cannot be solved only by long term demand management. Additionally, the WSAC developed and agreed to a Water Supply Augmentation Strategy. The overarching goal of the WSAC Water Supply Augmentation Strategy was to provide significant improvement in the sufficiency and reliability of the City water supply by 2025. Following City Council acceptance of the WSAC's recommendations in November 2015, Council directed staff to incorporate the Water Supply Augmentation Strategy into the Water Department's 2020

[3] The WSAC was formed by the City Council in 2014 to "explore, through an iterative, fact-based process, the City's water profile, including supply, demand and future risks; analyze potential solutions to deliver a safe, adequate, reliable, affordable and environmentally sustainable water supply; and, to develop recommendations for City Council consideration" (WSAC 2015).

UWMP. As presented in the 2020 UWMP, the Water Supply Augmentation Strategy portfolio elements includes simultaneous analysis and evaluation of the following (City of Santa Cruz 2021a):

- **Additional water conservation** with a goal of achieving an additional 200 to 250 million gallons per year of demand reduction by 2035 by expanding water conservation programs.[4]
- **Passive recharge of regional aquifers** by working to develop agreements for delivering surface water to the Soquel Creek Water District and/or the Scotts Valley Water District[5] so they can rest their groundwater wells, help the aquifers recover, and potentially store water for use by the City in dry periods.
- **Active recharge of regional aquifers** by using existing infrastructure and potential new infrastructure in the Purisima aquifer in the Soquel-Aptos Basin (now referred to as the Santa Cruz Mid-County Groundwater Basin), in the Santa Margarita/Lompico/Butano aquifers (now referred to as the Santa Margarita Groundwater Basin) in the Scotts Valley area, or in both to store water that can be available for use by the City in dry periods.
- **A potable water supply using advanced-treated recycled water** as its source as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the goals of cost-effectiveness, timeliness, or yield. In the event advanced-treated recycled water does not meet the City's needs, seawater desalination would become the supplemental or replacement supply.

It is important to note that two of the included Water Supply Augmentation Strategies, passive recharge of regional aquifers, and active recharge of regional aquifers, require the ability to divert, treat, and store more water in the wet season when source water turbidity and existing treatment process limitations of the Graham Hill Water Treatment Plant make doing so challenging.

Between 2016 and 2021, the City completed additional detailed analyses of a full range of supply augmentation options, explored partnerships with other regional water utilities, and actively participated in the development of Groundwater Sustainability Plans for both the Mid-County and the Santa Margarita Groundwater Basins. Additionally, the City initiated a climate change vulnerability analysis that was specifically designed to assess water system performance over a wide range of plausible future climate conditions and identify the range of supply deficits that the City needs to plan for to achieve reliability. The 2022 Securing Our Water Future (SOWF) Policy adopted by the Council in November 2022 bring this work together and sets a supply reliability goal that meets all customer demand without assuming that water supply curtailments will be used as a drought management tool (City of Santa Cruz 2022). The SOWF Policy acknowledges that, due to the length of time required to develop supply augmentation projects, and the need to use an ongoing and evolving understanding of the impacts of climate change on water supply reliability, incremental implementation of augmentation projects to address the supply deficit will be required. To reduce the vulnerability to nearer term droughts, however, supply augmentation producing at least 500 million gallons a year of additional supply by 2027 should be completed (City of Santa Cruz 2022).

The climate assumptions used to set the supply augmentation target is a worst-case drought using very moderate assumptions about increased temperatures, changed precipitation and increased variability. The SOWF Policy also states that additional water supply resources available to achieve water supply reliability in Santa Cruz are limited to those available locally, including surface water flows from local rivers and streams during wet seasons, local

[4] The recommended long-term demand reduction to be achieved through various programmatic conservation efforts was intended to be in addition to earlier long-term demand management efforts that had already resulted in a 25% reduction in residential gallons per capita per day.

[5] While WSAC recommendations considered only delivering surface water to Soquel Creek Water District and Scotts Valley Water District, current conceptual-level planning considers delivering surface water to San Lorenzo Valley Water District and Central Water District as well.

groundwater resources, various forms of treated recycled water, and seawater desalination. Included in the SOWF Policy are guiding principles and primary evaluation criteria that will be used to evaluate and select the supply augmentation projects needed to achieve the water supply reliability goal. Implementation of the Proposed Project would support WSAC elements involving passive and active recharge as well as supply augmentation as described in the SOWF Policy. Specifically, the Proposed Project would support conjunctive management of surface and groundwater supplies to improve water supply. In general, this involves the storage of water in local aquifers or delivery to regional water agencies during times when water is available, facilitating the return of stored water from the aquifer to the City during droughts or other shortages. Passive and active recharge strategies would involve treating increased volumes of winter or wet season surface water. These wet season waters have additional treatment requirements, due to higher turbidity and more challenging water quality conditions, which the Proposed Project would be able to treat.

3.2.3 Existing GHWTP Facilities

The GHWTP is the City's only surface water treatment plant. The GHWTP was originally constructed and commissioned into service in 1960. In the late 1960s the facility was expanded, and in the 1980s the mechanical, electrical and chemical equipment, and control systems were largely modernized. Since the 1980s, modifications to the GHWTP have been made focusing on in-kind repairs and replacements, seismic upgrades, and minor improvements in response to changing regulations and permit requirements. These improvements include the addition of lamella clarifiers[6], electrical improvements, filter rehabilitation and upgrades, and most recently the replacement of the tube settlers and flocculator paddles. In addition, the replacement of three on-site concrete tanks is currently underway. While modest improvements have been made over the life of the facility, several of the structures and most of the underground infrastructure at the GHWTP are of original construction and as such are aging and in need of rehabilitation or replacement. Additionally, the treatment process in place is in need of upgrade or replacement, as further described in Section 3.2.4, Water Quality and Water Treatment Challenges.

The current treatment process consists of pre-oxidation and adsorption (via potassium permanganate [$KMnO_4$] and powdered activated carbon contactors); pre-chlorination (disinfection) coagulation, flocculation, and clarification with tube settlers; filtration; corrosion control; and the addition of chlorine to provide a disinfection residual for the distribution system. Filter backwash water and sedimentation basin solids are recycled through a plate settler clarification system (lamella clarifiers) that separates process water from solids, the former is returned to the beginning of the conventional treatment process. Solids are sent to the City's wastewater treatment plant. Except for very limited planned and unplanned outages, the GHWTP is in operation 24 hours a day, 365 days a year and is staffed by State-Certified Water Treatment Operator (Operators) at all times. In addition, the City's Water Quality Section operates a State-Certified drinking water quality laboratory (Water Quality Lab) at the site. The Water Quality staff perform regulatory sampling at the GHWTP and throughout the distribution system, as well as sampling to characterize source water conditions including targeted sampling during storm events.

The GHWTP is a secured and fenced facility that is closed to the public. The GHWTP has an entrance access road off of Graham Hill Road, with a security gate; internal access roads; Operations and Filter Building, including filtration basins; emergency backup generator; Electrical Building, Water Quality Lab, and two multi-use trailers; three water treatment trains composed of powder activated carbon contact basins and flocculation/sedimentation basins; two flash mixing units; chemical storage facilities and chemical feed systems; concrete tanks for wash water storage, solids storage, reclaimed water and filtered water storage; reclaimed water clarifiers (lamella clarifiers);

[6] A lamella clarifier is a type of clarifier composed of inclined plates designed to remove particulates from liquids.

pump stations; as well as other ancillary and supporting facilities. Currently, the GHWTP has a rated capacity of 24 mgd. In recent years, maximum daily demands and associated production at GHWTP have more typically ranged from approximately 9 to 12 mgd, while the annual average daily demand is approximately 7.8 mgd.

The City selects its water sources and the blend for treatment at the GHWTP based on multiple variables, which vary seasonally, including source water availability, source water quality, the limits imposed by the City's pending water rights modifications (City of Santa Cruz 2021b) and pending Anadromous Salmonids Habitat Conservation Plan, and water demand. The water rights and Anadromous Salmonids Habitat Conservation Plan provisions define the maximum diversion rates and volumes (varies by month and water year), seasonal limitations on diversion, minimum bypass flows, ramping rates (the acceptable rate of change of stream levels due to changes in diversion), and other factors such as stream water quality conditions.

3.2.4 Water Quality and Water Treatment Challenges

In operating and maintaining a water system, the City's mission is to ensure public health and safety by providing a clean, adequate, and reliable supply of water. As described in Section 3.2.1, most of the City's supply comes from flowing water sources – such as rivers and streams. While high quality drinking water begins with actively protecting these flowing water sources, ultimately the delivery of safe drinking water from surface water sources cannot be accomplished without treatment at the GHWTP and management of the drinking water distribution system.

To ensure that tap water is safe to drink, water treatment is highly regulated at the federal level through the U.S. Environmental Protection Agency (EPA) and at the state level through the State Water Resources Control Board Division of Drinking Water (DDW). Among other requirements, these agencies provide regulations and requirements that establish the maximum concentration of regulated contaminants that can be present in water that complies with drinking water standards and is served by water service providers. Additionally, regulations also provide requirements for use of treatment techniques to ensure removal of harmful pathogens. Key regulations include the following:

- **Revised Total Coliform Rule (residual disinfection):** This Rule establishes a maximum contaminant level (MCL) for various pathogens to initiate a "find and fix" approach to address fecal contamination that could enter into the distribution system.[7] It requires public water systems to perform assessments to identify sanitary defects and subsequently take action to correct them. Total coliform counts give a general indication of the sanitary condition of a water supply (EPA 2013).
- **Lead and Copper Rule:** This Rule establishes an action level (AL) for lead and copper.[8] An AL exceedance is not a violation but can trigger other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring/treatment, public education, and lead service line replacement (EPA 2008).
- **Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) and Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR):** These Rules reduce illness linked with the contaminant Cryptosporidium and other pathogens in drinking water and supplement existing regulations by targeting additional Cryptosporidium treatment requirements to higher risk systems (EPA 2005).These rules also prevent significant increases in microbial risks that might otherwise occur with the implementation of the Stage 1 Disinfectants and Disinfection Byproducts below (EPA 2002).

7 The highest level of a contaminant that is allowed in drinking water.
8 The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

- **Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules:** The Stage 1 Disinfectants and Disinfection Byproducts (DBP) Rule reduces drinking water exposure to disinfection byproducts. The Stage 2 DBP Rule strengthens public health protection by tightening compliance monitoring requirements. The rule targets public water systems with the greatest risk. DBPs can form in water when disinfectants used to control microbial pathogens combine with naturally occurring materials found in source water. DBPs, if consumed in excess of EPA's standard over many years, may increase health risks (EPA 2023).

A variety of naturally occurring and human-introduced contaminants are regulated and may be present in source waters across California, including source waters treated by the GHWTP. These contaminants may include microbial contaminants; inorganic contaminants such as sediments, salts and metals; fertilizers, herbicides and pesticides; organic chemical contaminants that are industrial byproducts; microbial contaminants (such as viruses, parasites, protozoa, and bacteria); and total organic carbon (TOC). TOC is often measured as a non-specific indicator of water quality.[9] Water treatment plants such as GHWTP are designed to treat the specific character and condition of the water source feeding the treatment facility. The GHWTP treatment process must be able to respond to a variety of potential contaminants, such as those listed above, to regulatory requirements, and to changing climate conditions, as further described herein.

The GHWTP currently operates under a DDW domestic water supply permit and complies with all applicable drinking water regulations (City of Santa Cruz Water Department 2021). All water supplied by the City for domestic purposes meets all State and Federal criteria for public health protection. To assess ongoing compliance with water quality standards, drinking water samples are collected weekly and tested by the City's Water Quality Lab, using state-certified testing procedures and equipment. The City also uses continuous treatment process control monitoring (including computerized tracking and recording) overseen by the Operators. In addition to routine monitoring of source water, treated water, and the distribution system, the City also voluntarily monitors for unregulated contaminants of emerging concern (CECs) (e.g., pesticides, pharmaceuticals, endocrine disrupting compounds, personal health care products, and industrial chemicals such as per- and polyfluoroalkyl substances [PFAS]).

The GHWTP faces a number of challenges due to the age of the City's facility, existing water quality, water quality changes due to anticipated climate change impacts, the nature of the City's water distribution network, future expanded treatment of wet season surface water, and anticipated pending and future regulatory changes. While water treated at the GHWTP continues to meet treatment technique requirements and meet maximum contaminant levels or be below ALs established by the State Drinking Water Standards, the City has invested substantial effort to characterize the water quality from the various supply sources and has identified several source water vulnerabilities. Treatment vulnerabilities include potential future regulations of CECs and contaminants for which EPA has collected information under several Unregulated Contaminant Monitoring Rule cycles, and requirements from the City's water supply permit issued by DDW (AECOM/W.M. Lyles Co. 2022a). Specific treatment challenges include: DBP control; taste and odor control; treatment of microbial contaminants, CECs, and turbidity; and proper disposal of solids. These treatment challenges and information about how the Proposed Project would address such challenges are further described in Section 3.4.2.2.

These treatment challenges may be magnified by climate change impacts. Climate models for California predict that the state will experience increases in severe flooding events and more variability from multi-year dryness to extreme wet years, as a result of climate change (Swain et al. 2018). With more frequent and extreme weather

[9] TOC is the amount of carbon atoms tied up in organic compounds in a water sample, and it is a non-specific indicator of water quality (because pure water contains no carbon). It does not identify specific carbon-containing compounds, only the presence of unwanted organic compounds in pure water.

events (drought, more intense rain, and wildfires) it is important that the City consider the impacts of such events on its source water quality, treatability, and availability. More intense rains will increase source water turbidity beyond the GHWTP's current ability to effectively treat and may do so for longer periods of time. Similarly, extended droughts will impact water quality both during the drought (e.g., increased potential for algal blooms at Loch Lomond Reservoir, increased reliance on groundwater and potential for seawater intrusion) and following the drought (e.g., the first rainfall after an extended drought is likely to contain higher levels of contaminants and to introduce those high concentrations into local water bodies) (AECOM/W.M. Lyles Co. 2022a).

Given the forested nature of the source water watersheds, wildfires and subsequent precipitation events have the potential to impact source water quality and treatment processes at the existing GHWTP. Wildfire can have significant impacts on the chemical, microbiological, and physical properties of source water and therefore could limit the existing GHWTP water treatment processes' ability to treat source water and to deliver treated water. Post fire runoff and debris flows from burned areas can pick up and transport large amounts of fire related debris, sediment, and chemicals (such as fire retardants) that significantly affect the water quality and treatability of water for drinking water purposes. The burned areas and tributaries that flow into source water may transport ash, which can contain higher nutrient levels, as well as synthetic and volatile organic chemicals, organic carbon, sediment, metals, and suspended solids. With increased drought conditions, instances of wildfire in California, and in the Santa Cruz region in particular, are predicted to increase. These predictions underline the need to improve the treatment process capability at GHWTP, building in flexibility and adaptability to address reasonably anticipated future conditions (AECOM/W.M. Lyles Co. 2022a).

3.3 Project Purpose and Objectives

Section 15124 of the California Environmental Quality Act (CEQA) Guidelines indicates that the environmental impact report (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.

Across the Country underinvestment in critical infrastructure has resulted in aging and inadequate facilities, that are underprepared to respond to the stressors posed by a changing climate and new regulations. For instance, the 1960s era GHWTP has not been substantially improved since the 1980s and is in need of improvements. These improvements would address deficiencies related to the age of the facility and associated design limitations of the GHWTP to respond to stressors posed by a changing climate and new regulations. Consequently, the underlying purpose of the Proposed Project is to provide for a modernized treatment plant that: meets contemporary seismic, building, electrical, and fire code requirements; improves the ability to treat wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy; increases the City's treatment reliability; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms and drought conditions . The objectives for the Proposed Project are as follows:

1. Provide an adaptable water treatment facility, that can readily recover from and/or adjust to changing water quality or other potentially disruptive events by using multiple process tools, operational changes, switching between supply sources, or adjusting flow rates.
2. Provide treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions

expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC).

3. Provide treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for treatment of currently unregulated contaminants (e.g., CECs), provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality changes, and flow conditions.
4. Provide flexibility for installation of additional treatment equipment, if warranted, to adapt to future regulations, source water quality and flow conditions.
5. Support the implementation of the City's Water Supply Augmentation Strategy related to passive recharge of regional aquifers via water transfers and exchanges and active recharge of regional aquifers via aquifer storage and recovery), and SOWF Policy in order to deliver a safe, adequate, reliable and environmentally sustainable water supply.
6. Rehabilitate existing aging infrastructure to allow reusing and extending its useful life, to the extent feasible, or decommissioning and replacing it.
7. Provide a cost-effective project that optimizes the benefits and total cost of ownership (i.e., life cycle cost) for the City and complete construction at or below the Proposed Project budget.
8. Support the City's effort and policy to apply Health in All Policies (HiAP) approach and equity practices to City decision-making. The HiAP approach includes three pillars: sustainability, equity, and public health. The Santa Cruz Water Department goals under these pillars include:
    a. Sustainability: Support the health of the surrounding environment, implement environmentally superior building materials and designs, reduce energy and water use in municipal buildings, reduce greenhouse gas emissions, and support the development of renewable energy sources.
    b. Equity: Create and foster maximum organizational effectiveness, such as providing responsible financial stewardship, and identifying and engaging a diverse set of potential stakeholders.
    c. Public Health: Preserve and secure reliable water supplies, considering future impacts of climate change and natural hazards to water service reliability and meeting current and foreseeable drinking water standards.
9. Throughout the construction process, maintain production of potable water delivery throughout the City distribution system, without incurring emergency plant shutdowns, permit violations, or exceedances of drinking water standards, due to construction activities.
10. Provide a water treatment facility that meets current seismic, building, fire, and electrical codes; protects buildings in the wildland urban interface, as warranted; and meets DDW permitting requirements.

3.4 Project Characteristics

3.4.1 Project Overview

The Proposed Project would replace and substantially upgrade the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities. The Proposed Project would improve the GHWTP to: meet current seismic, building, electrical, and fire code requirements; support the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy; increase the City's treatment reliability to meet current and anticipated future water quality requirements; and improve the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms and droughts. Water quality regulations that would be addressed by the Proposed Project include: Revised Total Coliform Rule (disinfection), Lead and Copper Rule (corrosion control), LT1ESWTR

and LT2ESWTR (microbial contaminants removal), and Stage 1 and Stage 2 DBP Rules (DBP and TOC control) (see Section 3.2.4, Water Quality and Water Treatment Challenges, for a summary of these regulations). Characteristics and elements of the Proposed Project include the following:

- **Reliable Water Treatment Plant Capacity.** The Proposed Project would be designed to reliably produce a maximum of 18.2 million gallons per day, under a broad range of source water conditions.
- **New and Upgraded Water Treatment and Related Processes.** The Proposed Project includes the following process upgrades:
  - ***Pretreatment.*** Replacement of the existing conventional pretreatment process at the GHWTP with high-rate clarification with plate settlers.[10] This process would allow for enhanced coagulation to remove higher levels of TOC and turbidity associated with winter water supplies and increased use of the Newell Creek supply.
  - ***Treatment.*** After the new pretreatment processes, water would be treated with a combination of existing processes (to be retained) and new processes that would be designed to meet all applicable regulatory requirements and industry best practices. Proposed new and upgraded treatment processes include:
    - Ozonation (with hydrogen peroxide) via ozone contact. Ozonation/peroxide would provide reliable Stage 1 DBP and Stage 2 DBP rule compliance by oxidizing TOC making it less reactive with chlorine and increasing TOC removal in the biologically active filter. Other benefits include increased pathogen inactivation, CEC removal, and taste and odor control.
    - Biological filtration (via conversion of the existing filtration basins). Biological filtration would increase TOC removal and provide biologically stable water to the distribution system.
    - Future granular activated carbon (GAC) adsorption or similar technology (a potential process that could be installed in the future, if needed). Removes additional TOC during extreme events such as a wildfire in the watershed and removes CECs including PFAS, if needed.
    - Post-chlorination (via relocation of the chlorination point after GAC adsorption, if added in the future). Reduces distribution system DBP concentrations and provides reliable Stage 1 DBP and Stage 2 DBP rule compliance.
    - Future ultraviolet (UV) disinfection (a potential process that could be installed in the future, if needed due to higher levels of Cryptosporidium in the water supply).
    - New wash water storage tanks to replace the existing wash water storage tank.
  - ***Solids Handling System.*** The Proposed Project would include improvements for processing water treatment residuals, which are the by-products of water treatment and contain sediment and other contaminants, collectively referred to as solids or residuals. Proposed Project improvements to handle such residuals include a new solids handling system consisting of:
    - Expanding the number of existing reclaimed water clarifiers (lamella clarifiers) from two up to four
    - Installing new solids dewatering facilities including:
      - Centrifuge dewatering.
      - Drive-through unloading operation to loadout dewatered solids onto haul trucks.
      - Thickened solids equalization tank that would be repurposed from an existing concrete bulk storage tank.

[10] Pretreatment refers to the processes of coagulation, flocculation, and sedimentation and is designed to clarify water and remove turbidity and total organic carbon.

  - Dewatering feed pump station.
  - Sewer discharge improvements to support solids handling system (see below under Infrastructure and Site Improvements).
- ***Chemical Feed System Upgrades.*** Chemical feed system upgrades would be installed to support the new and upgraded treatment and solids handling processes.

- **New and Upgraded Buildings.** The Proposed Project would include new and upgraded buildings including:
  - ***Upgraded Operations and Filter Building.*** An upgraded approximately 19,600-square foot Operations and Filter Building, including a new administration wing, to support the operations and maintenance, administration, and filtration functions of the GHWTP.
  - ***New Maintenance Building.*** A new approximately 2,400-square foot Maintenance Building with workshop and storage space and welding, painting, and sandblasting areas to reduce the number of temporary structures currently at the GHWTP.
  - ***New Ozone Building.*** A new approximately 3,600-square foot Ozone Building to house the chemicals and equipment for the ozone treatment.
  - ***New Solids Dewatering Building.*** A new approximately 2,700-square foot Solids Dewatering Building to house the solids dewatering facilities.
  - ***New Chemical Storage and Feed Building.*** A new approximately 3,000-square foot Chemical Storage and Feed Building would house chemicals and pumps and metering equipment for the GHWTP.
- **Infrastructure and Site Improvements.** Proposed Project infrastructure and site improvements would include:
  - ***Sewer Improvements.*** Sewer improvements to support the new solids handling system involve either discharge to the County sewer line in Graham Hill Road, which may require a new sanitary lift pump station to connect to the County's line, or discharge to a City sewer line in Ocean Street Extension, which would require replacement.
  - ***Stormwater Management Improvements***. Stormwater management improvements include updating the existing stormwater collection system to accommodate collection of runoff from new impervious surfaces consistent with City's Storm Water Management Program and potentially replacing or rehabilitating some or all of the existing dedicated storm drain line that discharges directly to the San Lorenzo River.
  - ***Electrical; Lighting; Heating, Ventilation, and Air Conditioning (HVAC); Supervisory Control and Data Acquisition (SCADA); and Alarm Improvements.*** These improvements would include:
    - The electrical distribution system would be expanded with local distribution to serve the various components of the Proposed Project.
    - The upgraded Operations and Filter Building would be made ready for solar photovoltaic panels in the future in the space available after installation of skylights, vents, etc.
    - Existing natural gas infrastructure would be removed and replaced with electrical infrastructure.
    - Exterior safety lighting that meets Title 24 of the California Energy Code requirements and is Dark Sky-compliant may be installed, similar to existing lighting at GHWTP.
    - New HVAC equipment would be installed in new buildings.
    - A new SCADA system and fiber optic conduits and cables would be installed to provide for the operations and monitoring of the new processes.

- ***Vehicular Access Improvements.*** Vehicle access improvements would include:
  - Internal vehicular access improvements to improve traffic circulation through the GHWTP, including for chemical delivery trucks, hauling trucks, and other delivery trucks.
  - New parking to address inadequate parking for existing staff, visitors, maintenance, and fleet vehicles.
  - Electrical vehicle charging stations.
  - Secure vehicle access gates and internal signage.
  - Traffic calming measures on Graham Hill Road (e.g., warning signs at entrance).
- ***Screening and Landscaping Improvements.*** The Proposed Project would include screening and landscaping improvements using locally native, fire resistant, and drought-tolerant species.
- ***Fencing and Site Security Improvements***. Proposed Project site security improvements could include improvements to perimeter fencing, interior fencing around the pretreatment process, and closed-circuit television surveillance.

- **Project Operations and Maintenance.** Under the Proposed Project, operation and maintenance of the upgraded GHWTP would include many activities largely consistent with current activities, as well as new activities related to the new treatment process and solids dewatering equipment.
- **Project Construction.** The project construction is anticipated to commence in phases over a four-year period (from 2025 through 2029) while maintaining ongoing operations and continuous production of drinking water at GHWTP. The City has identified standard construction practices that would be implemented by the City and/or its contractors during construction activities to provide erosion and air quality controls, water quality and habitat protection, inadvertent discovery of cultural resources, construction noise and emissions practices, fire safety measures, and pre-construction nesting bird surveys. Additionally, the Proposed Project would implement the applicable avoidance and minimization measures from the City's Low Effect Habitat Conservation Plan (LEHCP) and associated Incidental Take Permit under Section 10(A)(1)(B) of the Endangered Species Act.

3.4.2 Description of Project Components and Treatment Processes

3.4.2.1 Reliable Water Treatment Plant Capacity

The Proposed Project would be designed to reliably produce a maximum of 18.2 mgd, under a broad range of source water conditions. As stated in Section 3.2.3, Existing GHWTP Facilities, the existing GHWTP has a rated capacity of 24 mgd; however, it does not operate at that capacity. The Proposed Project would be sized to reliably meet expected future demands, plus the amount that could be needed to support the Water Supply Augmentation Strategy and SOWF Policy, as well as a factor of safety. The Proposed Project treatment capacity is driven in part by the amount of water to be treated during the winter and spring months for the purpose of passive and active groundwater recharge (water supply augmentation). While the amount of water anticipated for water supply augmentation during the winter and spring is estimated to be 7 mgd (Gary Fiske and Associates 2017), subsequent planning and analysis is underway that may reduce the amount of water for supply augmentation. A reduction in the amount of water for supply augmentation could justify a reduction in the ultimate capacity of the Proposed Project.

3.4.2.2 New and Upgraded Water Treatment and Related Processes

The new and upgraded water treatment and related processes associated with the Proposed Project would allow the City to reliably and efficiently meet the identified water quality challenges and to meet all treatment goals even with source waters that are more difficult to treat. Table 3-1 shows a comparison between the existing GHWTP processes and the new and upgraded processes that would be included in the Proposed Project and their general contributions to achieving the regulatory requirements and treatment goals. The Proposed Project treatment goals are condensed and listed along the top of the table, against which various treatment processes or "tools," as listed on the left side of the table, can be used to meet the goals. The comprehensive list of treatment goals is provided in Appendix B. The Proposed Project is designed to meet or surpass these goals. Figure 3-5 provides an illustrative comparison between the existing GHWTP processes and the new and upgraded processes. Figure 3-6 provides the site layout for the Proposed Project. The new and upgraded water treatment and related processes that would result with the Proposed Project are further described herein.

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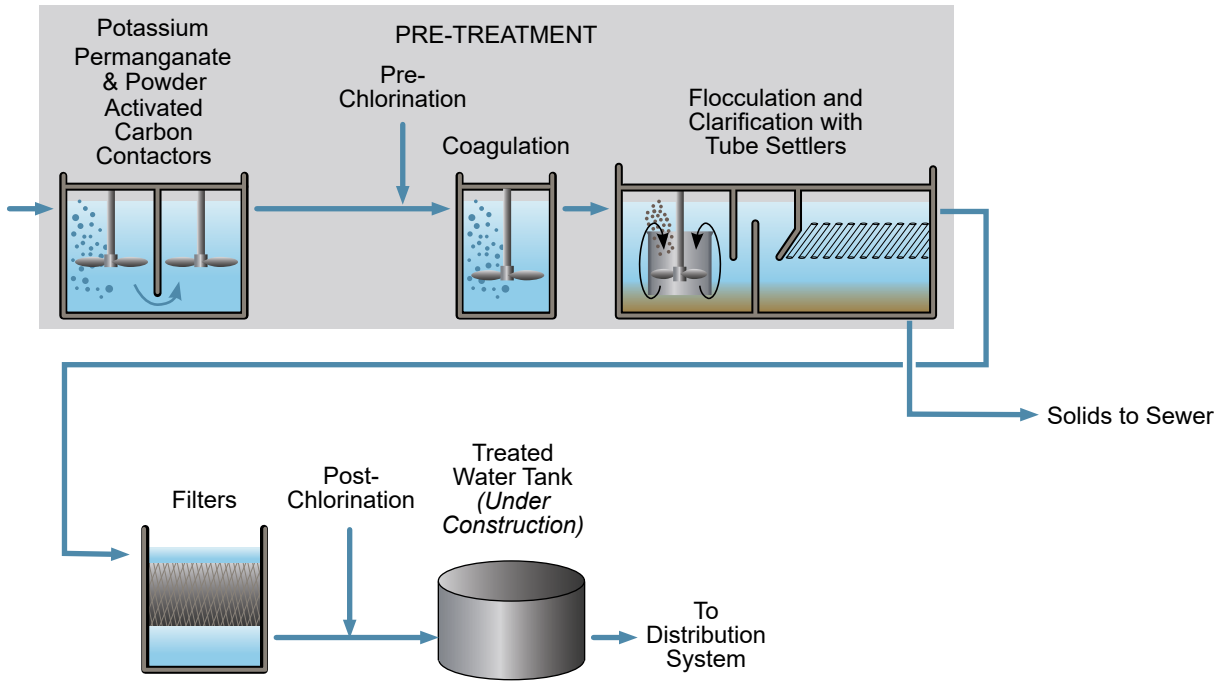
Existing Processes



Proposed New Processes

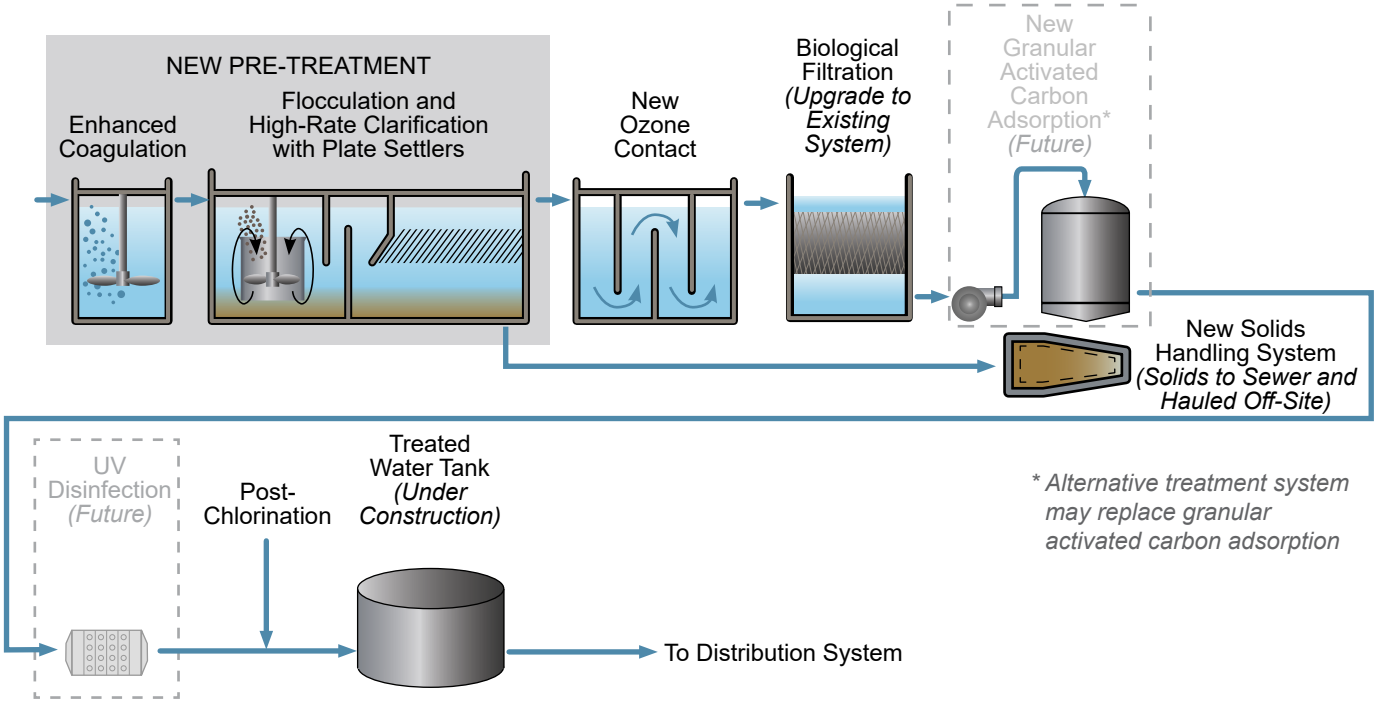


FIGURE 3-5

Existing and Proposed Treatment Processes

Graham Hill Water Treatment Plant Facility Improvements Project

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Legend

- 05 Flash Mixing
- 07 Wash Water Reclaim Tank *(Under Construction)*
- 08 Lamella Clarifiers 1 and 2 *(Existing)*
- 09 Solids Storage Tanks *(Under Construction)*
- 10 New and Enhanced Coagulation, Flocculation and High-Rate Clarification with Plate Settlers *(Reuse Existing Sedimentation Basins)*
- 11 Treated Water Tank *(Under Construction)*
- 14 Stand-by Generator *(Existing)*
- 15 Liquid Oxygen Tank
- 19 Filtered Water Tank Inlet Structure *(Existing)*
- 20 Ozone Building
- 25 Upgraded Operations and Filter Building
- 45 Chemical Storage
- 47 Chemical Storage *(Existing)*
- 50 Chemical Storage and Feed Building
- 55 Lamella Clarifiers 3 and 4
- 60 Thickened Solids Equalization Tank *(Repurpose Existing Concrete Bulk Storage Tank)*
- 65 Solids Dewatering Building
- 72 Chemical Containment Trench
- 85 Maintenance Building
- 90 Electrical Building *(Existing)*
- 95 Wash Water Storage Tank 1 *(Existing, to be Rebuilt)* and Wash Water Storage Tank 2 *(New)*

- Existing Building/Facility to Remain
- Existing Building to be Demolished
- Existing Building/Facility to be Upgraded and/or Replaced
- New Building/Facility
- Future Building/Facility
- Existing Fence to be Replaced or Repaired as Needed

FIGURE 3-6

Proposed Site Layout

Graham Hill Water Treatment Plant Facility Improvements Project

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Table 3-1. Comparison of Existing GHWTP and Upgraded GHWTP Treatment Processes to Address Treatment Goals

Treatment Process	Disinfection By-Product Control[1]	Taste and Odor Control[2]	Microbial Contaminants[3]	Contaminants of Emerging Concern[4]			Turbidity and Solids Handling[5]
				HAA9s	Pharmaceuticals, pesticides	PFAS/ PFOS	
Existing GHWTP Processes to be Replaced							
Pretreatment – ▪ Potassium Permanganate & Powder Activated Carbon Contactors	✓	✓	–	✓	✓	✓	–
▪ Coagulation	✓	–	–	✓	–	–	–
▪ Flocculation and Clarification with Tube Settlers	–	–	–	–	–	–	✓
Existing GHWTP Processes to be Retained							
Pre-Chlorination (Emergency Use Only)	–	–	✓	–	–	–	–
Filtration	–	–	✓	–	–	–	
Source Water Blending	–	–	✓	–	–	–	✓
Reclaimed Water Clarifiers (Lamella Clarifiers)	–	–	✓	–	–	–	✓
Proposed GHWTP Treatment Processes							
Pretreatment – New and Enhanced Coagulation, Flocculation and High-Rate Clarification with Plate Settlers	✓	–	–	✓	–	–	✓
Ozone Contact	✓	✓	✓	✓	✓	–	–
Biological Filtration (Upgrade to Existing Filters)	✓	✓	–	–	–	–	–

Table 3-1. Comparison of Existing GHWTP and Upgraded GHWTP Treatment Processes to Address Treatment Goals

Treatment Process	Disinfection By-Product Control[1]	Taste and Odor Control[2]	Microbial Contaminants[3]	Contaminants of Emerging Concern[4]			Turbidity and Solids Handling[5]
				HAA9s	Pharmaceuticals, pesticides	PFAS/ PFOS	
Granular Activated Carbon Adsorption (Future)[6]	✓	✓	–	✓	✓	✓	–
Ultraviolet Disinfection (Future)[7]	–	–	✓	–	–	–	–
Post-Chlorination	✓	–	✓	✓	–	–	–
Solids Handling System	–	–	–	–	–	–	✓

Source: AECOM and W.M. Lyles Co. 2022a.

Notes: PFOS = perfluorooctane sulfonate; PFAS = per- and polyfluoroalkyl substances; HAA9 = group of nine haloacetic acids

1 Disinfection by-products (DBPs) are organic and inorganic substances that are formed when disinfectants used in water treatment plants interact with naturally occurring substances in the water source, such as bromide and/or natural organic matter (e.g., decaying vegetation). DBP concentrations are regulated by Federal and State drinking water regulations since high concentrations and chronic exposure to DBPs can be harmful to human health and may increase risk of cancer. Applicable regulations include Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules.

2 Taste and odor issues can result from naturally occurring algal blooms in Loch Lomond Reservoir and from other species of algae in rivers streams and reservoirs. Warmer temperatures associated with climate change will likely lead to more frequent and larger algae blooms. At high concentrations algal toxins can be toxic to animals and humans. The City has an active lake management program that includes treatment of algae blooms, but currently GHWTP has limited ability to deal with associated taste and odor issues.

3 Microbial contaminants, such as viruses, protozoa, parasites, and bacteria are present in City source waters and may come from septic systems, agricultural livestock operations and wildlife. Examples include Giardia and Cryptosporidium. One of the primary functions of a water treatment system is to remove or inactivate these pathogens to make the water safe for consumption, as required by federal and state drinking water standards. Climate change and wildfires could result in increased runoff from the watershed potentially causing elevated levels of microbials in the source water. Applicable regulations include Long Term 1 Enhanced Surface Water Treatment Rule and Long Term 2 Enhanced Surface Water Treatment Rule

4 Contaminants of emerging concern (CECs) are source water contaminants that are generally considered as potentially regulated constituents. Pesticides, pharmaceuticals, endocrine disrupting compounds, and industrial chemicals are examples of these contaminants. Pesticides and herbicides may come from a variety of sources such as agriculture, urban storm water runoff and residential uses. Organic chemical contaminants, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can come from gas stations, urban storm water runoff, agricultural application, and septic systems.

5 Turbidity in source waters is caused by sediments (clay, silts, sands) washed into the rivers, streams, and reservoirs and from aquatic organisms growing in the water sources. These solids can act as hiding places for microbial pathogens plus the solids cause the water to be discolored affecting the aesthetics of the water for consumers. Climate change and wildfires could result in increased runoff from the watershed potentially causing elevated levels of sediments and solids in the rivers and streams.

6 Future granular activated carbon adsorption, or a similar technology, could be added in the future, if needed, to remove TOC and/or CECs including PFAS.

7 Future ultraviolet (UV) disinfection is a potential process that could be installed in the future, if needed, due to increased levels of Cryptosporidium.

Pretreatment Process

Pretreatment refers to the processes of coagulation, pH adjustment, flocculation, and sedimentation, which provide for clarification of water. The new pretreatment process would mirror existing processes at the GHWTP, except that the Proposed Project would use high-rate clarification with plate settlers, as opposed to the existing use of tube settlers. High-rate clarification with plate settlers has the benefit of requiring a smaller footprint compared to tube settlers, which would provide space at the GHWTP for additional treatment processes and other facility improvements. The pretreatment process would include the following components:

- Retention of the existing rapid mixer to provide redundancy;
- A new rapid two-stage mixer system (flash mixer) to introduce pretreatment chemicals (coagulants);
- A new injection point for pH adjustment via chemical addition (enhanced coagulation); and
- New sedimentation basins 1 and 2 for flocculation and high-rate clarification with plate settlers to be built within the existing sedimentation basins 2 and 3.

Pretreatment starts with the addition of pretreatment chemicals in the existing and proposed new flash mixers to initiate coagulation. Pretreatment chemicals at this stage include potassium permanganate, aluminum sulfate (alum), aluminum chlorohydrate, sodium hydroxide, and sulfuric acid. The latter two chemicals would facilitate enhanced coagulation, which is used to reduce the amount of naturally occurring TOC in source water, by adjusting the pH levels as needed. The new rapid mixer system would consist of a chemical induction system, which would consist of a high-energy mixer and diffusion nozzle.

Flocculation follows coagulation and involves lowering the mixing energy to promote the formation of larger, settleable floc particles. Three-stage tapered flocculation would be provided using new vertical shaft flocculators with variable frequency drives. The first stage would replace the existing vertical flocculators in-kind, and the second and third stage would replace the existing horizontal paddlewheel flocculators. Flocculated material would then flow by gravity to the new sedimentation basins 1 and 2, which would provide high-rate clarification with inclined plate settlers. As indicated previously, the new sedimentation basins 1 and 2 would be built within the existing sedimentation basins 2 and 3, which would be repurposed and improved to meet the current building code. There would be two trains of flocculation (and settling), and each train would be equipped with two first-stage flocculators operating in parallel. Flocculation aid polymer would be applied at the entrance to each flocculation train. Flocculated water would flow by gravity to two trains of clarification equipped with inclined plate settlers. The trains can either operate in parallel or can be isolated to allow a single train to operate during lower flow conditions or to facilitate maintenance activities. Solids that settle from the plate settlers would collect on the basin floor, and new cable-driven solids collectors would travel the length of the basin floor for transference to the wash water reclaim or solids storage tanks, currently under construction as part of the Concrete Tanks Project.

Ozone Contact

Settled water from the pretreatment process would flow by gravity to the new intermediate ozone contact system. Ozone is a naturally occurring, but unstable, atmospheric gas that is generated and used in water treatment to oxidize TOC making it less reactive with chlorine to form less DBPs, to provide disinfection of pathogens, bacteria, and viruses, to oxidize taste- and odor-producing compounds and other organic matter, and to remove CECs. Addition of hydrogen peroxide generates advanced oxidation reactions breaking down more organics and CECs. Organic matter would be broken down by biological activity in the existing filters to further reduce organics in the water, resulting in higher degree of DBP control (see Biological Filtration below). Ozonation would be accomplished

via ozone dosing to achieve oxidation of TOC to provide reliable DBP compliance in the distribution system, reliable disinfection of Giardia under all flow conditions, and partial disinfection of Cryptosporidium.

The ozone would be injected into the settled water in a concrete contact basin (ozone contactor), which would be constructed within a repurposed existing sedimentation basin. The ozone would be generated on site from delivered liquid oxygen (LOX), which would be delivered to and stored in a cryogenic pressurized vessel. The vessel is expected to be 12 feet in height and is equipped with a vaporizer system to convert LOX into a gas. The ozone equipment would include a new ozone generator that converts gaseous oxygen to ozone, a supplemental nitrogen system to promote efficiency of ozone generation, an ozone destruct system to control/prevent emissions of undissolved ozone into the atmosphere, control panels, hydrogen peroxide totes (i.e., storage containers), and other appurtenances. Equipment would also include safety sensors, alarms, and shutdown units. Calcium thiosulfate is used in the process to eliminate ozone before it enters the biological filters. The equipment and processes would be housed in a new Ozone Building, at grade, located on top of the ozone contactor (see Section 3.4.2.3, New and Upgraded Buildings). The ozone contactor would be constructed underground, within the footprint and empty space left behind by the decommissioning of existing sedimentation basin.

A hydrogen peroxide feed system, consisting of chemical storage totes, metering pumps, and chemical feed lines would be provided in the Ozone Building. The use of hydrogen peroxide would allow for advanced oxidation. The injected hydrogen peroxide reacts with ozone and is very effective at oxidizing a wide range of pollutants, including CECs and organic compounds.

Biological Filtration

Ozonated water would flow by gravity to the existing filters, which would be upgraded to biological filtration as part of the Proposed Project. There are six existing multimedia gravity filters, each containing anthracite coal on top of a bed of silica sand. The existing gravity filters would be converted to biological filters to enhance TOC removal. Filter improvements would include retaining the media, while modifying the discharge piping to add a filter-to-waste system and switching from chlorinated to non-chlorinated feed water. A filter aid, in the form of either a polymer or coagulant, would continue to be applied ahead of the filters, if needed. As with current operation, the filters would need to be backwashed periodically with water from the wash water storage tank (see Section 3.4.2.3). To dechlorinate the water from the wash water storage water, the current system would be modified to provide a calcium thiosulfate feed to eliminate the chlorine residual so that the beneficial biological growth in the filter media would not be negatively impacted.

Future Granular Activated Carbon Adsorption or Similar Technology

GAC is a porous adsorption media with an extremely high surface area that is useful for the further reduction of taste- and odor-producing compounds, organic matter, volatile organic compounds, synthetic organic compounds (e.g., PFAS/perfluorooctane sulfonate [PFOS]), and disinfection by-product precursors. GAC is a well proven tool for removing many pollutants, including PFAS, and is widely used in the industry; however, there are other technologies that could be used for the Proposed Project instead of GAC for removal of PFAS. These include ion exchange and “novel adsorbents”. Ion exchange (IX) is also well proven and works in a similar fashion to GAC, whereby the IX resin is installed in pressure vessels and as the water is pumped through the vessel, the IX resin adsorbs the pollutant. Novel adsorbents also work in this fashion. The main difference between GAC versus IX and novel adsorbents is that GAC is non-selective and will adsorb a range of pollutants, whereas IX and novel adsorbents are used for only specific pollutants (PFAS, in this case). Thus, while GAC provides the benefit of a multi-purpose process, it requires more initial carbon inventory and associated vessels because it reaches exhaustion more quickly than the other technologies,

which increases its footprint. Also, after reaching exhaustion, the media requires replacing, which increases the transportation and media replacement requirements. For the purposes of this EIR and providing a reasonable worst-case analysis, it is assumed that as part of the Proposed Project, space at the GHWTP would be reserved for the implementation of GAC, should such a treatment become necessary due to regulatory changes, reduced source water quality, or a combination of both factors, as further described below.

If needed in the future, after filtration through the biological filters, the filtered water would be pumped via three new pumps, such as new vertical turbine or submersible transfer pumps, through GAC contactors, where TOC and potential trace contaminants are adsorbed onto the GAC media.

The future GAC contactors would be at-grade vessels, 14-feet in diameter, 27-feet high, with the capacity to contain approximately 60,000 pounds of GAC each. Construction of the GAC contactors could occur in phases. Initial construction may include a partial installation of the GAC contactors. Space would be retained, and the associated infrastructure would be sized, to accommodate future installation of up to a total of eight GAC contactors that would be capable of treating the maximum flowrate.

Backwashing of the future GAC contactors would be accomplished using booster pumps on the primary backwash water line that serves the filters. Backwashing is expected to be infrequent, on the order of once every 2 or 3 weeks. Spent backwash water from the contactors would discharge to the wash water reclaim tank (see Solids Handling System below).

The GAC media is expected to require changeout after approximately 6 to 12 months, dependent on several factors, including source and filtered water TOC levels, GHWTP flowrates, and finished treatment goals. To minimize waste generation, the removed GAC media would be sent to an off-site facility to be reactivated. The future GAC contactors would be refilled with regenerated media.

Post-Chlorination

As part of the Proposed Project, pre-chlorination would be retained as an emergency provision, and the point of chlorination would be relocated to an injection point after GAC adsorption (post-chlorination). Pathogen removal via disinfection is a state requirement and is currently achieved by a practice referred to as pre-chlorination. Under existing conditions pre-chlorination involves injecting chlorine before flocculation in the powder activated carbon contactors. Pre-chlorination can lead to higher DBPs when source water organic substance levels are elevated, as is often the case for the City, and therefore would not be used except during emergencies. The soon to be constructed treated water storage tank would contain a chlorine contactor that would permit moving the chlorine addition point to the end of the treatment process. The benefit of post-chlorination, in combination with the ozone contact and biological filtration that would reduce the amount of organic matter in the water, is a reduction in the time that chlorine is in contact with any remaining organic matter, thus reducing the potential for DBP formation.

Future Ultraviolet Disinfection

As part of the Proposed Project, space at the GHWTP would be reserved for the implementation of a UV disinfection system, should such a treatment become necessary due to regulatory changes, reduced source water quality, or a combination of both factors. If needed in the future to address microbial contaminants, UV disinfection would be added ahead of the treated water storage tank, which is under construction as part of the Concrete Tanks Project. The primary equipment associated with a UV disinfection system includes lamps to provide UV light, reactors, and

electronic ballast, which would be housed in a single-story building or enclosure. The UV disinfection process would not generate a waste stream.

Wash Water Storage Tanks

The Proposed Project would include a new 500,000-gallon steel wash water storage tank that would replace the existing 500,000-gallon tank. The new wash water storage tank would be approximately 75 feet in diameter and up to 25 feet in height. In addition to a replacement tank, a new 150,000-gallon steel maintenance tank is proposed in the vicinity of the existing wash water tank. The new maintenance tank would be approximately 45 feet in diameter and up to 20 feet in height. This new steel tank would provide sufficient interim storage volume for backwash water, as well as to supply water to the water distribution system while the main tank is offline. This would allow the demolition of the existing tank and replacement with a tank at the same location and capacity. Having two tanks would provide redundancy, increased reliability, and the ability to conduct routine maintenance.

Solids Handling System

The process of water treatment produces residual water that contains sediment and other impurities. To minimize inefficient waste of this water to the sewer, and to maximize water supply, solids handling systems further refine residual water to generate water suitable for recycling, solids suitable for off-haul and disposal, and a discharge suitable for the sewer system.

The current GHWTP struggles to manage the high sediment concentration removed from source waters after heavy rain events and must rely solely on one, 4-inch-diameter sewer disposal line. Further, usage of the sewer disposal line is limited by the GHWTP's Significant Industrial User discharge permit issued by the City's Wastewater Treatment Plant. The Proposed Project would seek to improve the ability to manage removed solids by including a process that would mechanically concentrate the sediments from the water treatment process and off-haul that material from the GHWTP.

The Proposed Project would include processes to further clarify the residual water. Clarified water is returned to the headworks of the GHWTP (recycled water stream) through the reclaimed water clarifiers (lamella clarifiers) while the residuals are pumped to a new solids dewatering facility, which would use a centrifuge to separate solids for off-haul to a landfill and send the remaining liquid discharge to the sewer.

Residual water at the GHWTP is generated from existing and proposed processes. Residual water generated from the proposed processes includes: spent backwash water from filters; solids from sedimentation tanks with plate settlers; filter-to-waste from filters; and sedimentation basin/plate settlers cleaning; and spend backwash from future GAC adsorbers. The proposed solids handling system would include the following elements:

- Reclaimed water clarifiers (lamella clarifiers) (two existing units, with the addition of up to two additional units in this Proposed Project).
- Solids storage tank, wash water reclaim tank and associated pump stations (under construction as part of the Concrete Tanks Project).
- Solids dewatering facilities including centrifuge dewatering and loadout of dewatered solids onto haul trucks, thickened solids equalization tank, and dewatering feed pump station (Proposed Project).

Additionally, two options are being considered to provide for adequate sewer discharge to support the Proposed Project solids handling system (see Section 3.4.2.4, Infrastructure and Site Improvements, for additional details).

Reclaimed Water Clarifiers (Lamella Clarifiers)

As part of the Proposed Project, up to two new lamella clarifiers would add capacity to the two existing lamella clarifiers (for up to a total of four lamella clarifiers) for spent backwash and residuals recycling. Lamella clarifiers are a compact piece of equipment that provides coagulation, flocculation, and high-rate clarification for a small volume of water. In normal treatment plant operations, water used to rinse out the sedimentation basins and backwash the mixed-media filters is sent to the wash water reclaim tank. Rather than sending this water to waste, water from the tank is metered to lamella clarifies that remove sediment from the water. Through this process, the reclaimed water is sent back to the rapid mixer at the head of the treatment plant to go through the treatment process again, resulting in finished treated water. The waste from the lamella clarifiers would continue to be discharged to the existing sewer in compliance with the permitted flow and solids content.[11]

Solids Dewatering Facilities

The Proposed Project would include solids dewatering facilities for use during period of high solids generation, which would involve the use of a centrifuge. The new solids dewatering facilities would include repurposing an existing concrete bulk storage tank into a thickened solids equalization tank, a new dewatering feed pump station, and a new drive-through unloading operation for off-site disposal. Some of these facilities would be located within a new Solids Dewatering Building (see Section 3.4.2.3)

Solids dewatering is expected to be an intermittent process. With the Proposed Project, solids from the lamella clarifiers would be stored in the solids storage tank (under construction as part of the Concrete Tanks Project) and sent to the centrifuge to further remove water from the solids stream at times when the sewer disposal line cannot accept additional treatment process solids or the sewer discharge permit limit is reached. The centrifuge would reduce the solids volume and produce a dry, solids cake that can be efficiently removed from the GHWTP premises via haul trucks. The solids cake produced would be discharged to a screw conveyor system to load the hauling trucks. The screw conveyor would be in operation every time the dewatering system is in service. Solids must be conditioned with polymer before entering the dewatering process to ensure optimal performance and the resulting liquid discharge would be sent to sewer rather than recycled into the treatment process.

Chemical Feed System Upgrades

Many of the chemicals proposed for the Proposed Project are currently in use and would be retained at the GHWTP. Treatment chemicals currently in use at the GHWTP include potassium permanganate, aluminum sulfate (alum), aluminum chlorohydrate, aluminum orthophosphate, carbon aqueous solution, non-ionic polymer, anionic polymer, sodium hypochlorite, and sodium hypochlorite). New chemicals would include liquid oxygen, sodium hydroxide, sulfuric acid, calcium thiosulfate, hydrogen peroxide, and polymer for dewatering. Any chemicals used in the treatment process would be certified as meeting the specifications of National Sanitation Foundation International/American National Standard Institute (NSF/ANSI) Standard 60, which is a national standard that establishes the minimum health-effects requirements for the chemicals, chemical contaminants and impurities that are directly added to drinking water.

[11] Currently, the GHWTP has a wastewater discharge permit to discharge wastewater with solids directly into the sewer system to the City of Santa Cruz's wastewater collection system in compliance with special conditions that solids discharge shall not exceed a concentration of 3,320 milligrams per liter and shall not exceed 2,085 pounds per day. An amendment to this permit or a new permit may be required to allow for the Proposed Project.

Existing chemical feed lines, day tanks and pumps would be replaced as part of the Proposed Project except for the existing alum, aluminum chlorohydrate, and sodium hypochlorite bulk storage tanks, which would be retained. A new chemical storage area next to the existing chemicals bulk storage area would be constructed for additional bulk storage for new process chemicals and would include a new chemical unloading station. The existing chemical fill station would be decommissioned and a new chemical fill station would be provided on the north side of the GHWTP to serve both the existing and new chemical storage areas. A new Chemical Storage and Feed Building would be constructed within the existing sedimentation basin 1 footprint. The Chemical Storage and Feed Building would include day tanks storage, control panels, pumping and metering equipment for the chemicals referenced above (see Section 3.4.2.3).

New facilities for chemicals, unloading areas, and dosing pumps would be designed for full compliance with current safety codes and regulations, with provisions for emergency eye wash/shower stations, chemical spill containment areas, separation between acids and bases, and fire-suppression systems.

3.4.2.3 New and Upgraded Buildings

Upgraded Operations and Filter Building

The existing Operations and Filter Building, built in 1960, does not meet current California Building Code (CBC) and would require substantial strengthening modifications to meet such codes. In addition, the locker room and restroom facilities are dated and do not meet current CBC and Americans with Disabilities Act (ADA) accessibility requirements. The Proposed Project would include an upgraded approximately 19,600-square-foot Operations and Filter Building, including an administration wing, to support the operations and maintenance, administration, and filtration functions of the GHWTP. This would involve removal of the above-ground portion of the existing Operations and Filter Building, while protecting the existing basement and mechanical and electrical equipment in the operations portion of the building and the existing filtration basins in the basement of the filter portion of the building. Improvements to the below grade basement include mechanical, electrical, and instrumentation modifications. Additionally, seismic upgrades would also be made to the basement areas.

A new pre-engineered metal building would be installed over the existing remaining basement areas. The new above-grade building structure would be single-story above the existing basement areas with a maximum building height of up to 25 feet. Building materials include a steel structure with insulated metal panels on the exterior and an insulated metal roof with gutters and downspouts. An insulated wall would separate the filters from the non-process areas within the interior of building. The building would include commercial grade, insulated windows with overhangs and other shading. The upgraded Operations and Filter Building would replace the existing Operations and Filter Building to provide space for operations functions and would include operations/control room, laboratory, offices, locker rooms, restrooms, uniform closet, printer room, instrument repair space, janitorial locker, and mechanical and electrical rooms.

The upgraded Operations and Filter Building would include a new approximately 4,500-square foot administration wing to support the administrative functions of the GHWTP. The new wing would be single-story with a building height of up to 25 feet. Building materials include a steel structure with insulated metal panels. This new wing would replace the administrative space in the existing Operations and Filter Building to provide additional space for administrative functions and would include a conference room, reception area, breakroom, kitchen, server room, restrooms, storage areas, and mechanical and electrical rooms.

New Maintenance Building

The Proposed Project would include a new approximately 2,400-square foot Maintenance Building with workshop and storage space, mechanical and electrical rooms, and welding, painting, and sandblasting areas to reduce the number of temporary structures currently at the GHWTP. The building would be single-story with a maximum building height of up to 25 feet. Building materials include a steel structure with insulated metal panels on the exterior and an insulated metal roof with gutters and downspouts. The building would include commercial grade, insulated windows with overhangs and other shading. This building would include a workshop; designated uses for welding, sand and bead blasting, and painting; a restroom; mechanical and electrical rooms; indoor storage; and outdoor storage and staging areas. Roll-up vehicle doors would provide access to the workshop and the storage area.

New Ozone Building

The Proposed Project would include a new approximately 3,600 square foot Ozone Building to house the chemicals and equipment for the ozone treatment (see Section 3.4.2.2). The building itself would be a structure consisting of a single-story above grade with a maximum height of approximately 25 feet. The building would be constructed of reinforced concrete with concrete masonry unit (CMU) infill walls and insulated metal panel system on the exterior. The roof assembly would be a reinforced-concrete slab. The building would accommodate pumps and ozone equipment, some small quantities of chemicals, and an electrical room.

New Solids Dewatering Building

The Proposed Project would include a new approximately 2,700-square-foot Solids Dewatering Building to house the solids dewatering facilities (see Section 3.4.2.2). The Solids Dewatering Building would consist of a two-story rectangular structure with a maximum height of up to 45 feet. The building would be constructed of reinforced concrete with CMU infill walls with a concrete roof structure. The building would accommodate a semi-tractor trailer, dewatering equipment, some small quantities of polymer, a sampling room, and an electrical room. The sampling room will include a sink and bench space for samples, small oven, and miscellaneous laboratory tools. There would be an exterior staircase to access the second floor where the dewatering equipment would reside. Overhead doors would be on the northern and southern sides of the building to allow a full-size semi-truck to pull through the building. A retaining wall would need to be constructed, as the building would be situated against a sloping topography and would also serve as the building's exterior wall.

New Chemical Storage and Feed Building

The new approximately 3,000 square foot Chemical Storage and Feed Building would house chemicals for the GHWTP. The Chemical Storage and Feed Building would consist of a single-story rectangular structure with a maximum height of up to 25 feet. The building would be constructed of reinforced concrete with CMU infill walls and an insulated metal panel system on the exterior. The roof assembly would be concrete with insulated metal panels. The building would accommodate pumps and metering equipment, chemicals, and an electrical room.

3.4.2.4 Infrastructure and Site Improvements

Proposed Project infrastructure and site improvements would include sewer, stormwater management, electrical/lighting/HVAC/SCADA/alarm, vehicular access, screening and landscaping, and fencing and site security improvements.

Sewer Improvements

The GHWTP's existing sewer system has two, 4-inch gravity sewers. One sewer serves the Water Quality Lab, the existing temporary construction trailers, the lamella clarifiers, and the solids storage tank and wash water reclaim tank. The other sewer serves the existing Operations and Filter Building. These sewers combine at the lower part of the GHWTP into a 4-inch sewer lateral built in 1987 to modernize the GHWTP. This sewer lateral conveys GHWTP sewage southward on an existing line dedicated to the GHWTP within Ocean Street Extension to the City of Santa Cruz sewer main.

The existing 4-inch Ocean Street Extension sewer lateral has a capacity limited to approximately 150 gallons per minute (gpm) to service existing and proposed sewer and water treatment residuals flows. The Proposed Project is estimated to increase wastewater flow by up to 200 gpm during peak conditions. This increased flow is due to the upgraded treatment processes of the solids handling system; the number of staff at the GHWTP would not increase as a result of the Proposed Project. The City's existing 4-inch sewer lateral currently serving the GHWTP would not be able to accommodate the increased peak flows in addition to the existing sanitary flows, which combined are estimated to total up to approximately 350 gpm.

There are two options being considered to improve the sewer capacity to adequately serve the GHWTP: (1) build a new sewer main and a sanitary sewer lift station, if needed, to connect to the County's existing 12-inch sewer line within Graham Hill Road, which ultimately discharges to the City's collection system; and (2) replace the existing sewer line in Ocean Street Extension with one of larger capacity. The City prefers the first option and discussions have commenced with the County. A sewer capacity analysis of the County-owned sewer collection system demonstrates sufficient capacity exists to accommodate the Proposed Project flows from a new on-site sewer network and still accommodate future build-out of the County sewer service area. The City also evaluated the downstream City owned sewer collection system and confirmed that the existing system has sufficient capacity for the Proposed Project flows.

Connect to County Sewer Line

If the City can connect to the County sewer main in Graham Hill Road, a new on-site sewer network with several new sewer manholes would be installed as part of the Proposed Project to collect discharges from the new Maintenance Building, Chemical Storage and Feed Building, Solids Dewatering Building and portions of the Operations and Filter Building. Sanitary sewer flows from the Water Quality Lab could also potentially be diverted to the new on-site sewer network. The Operations and Filter Building, lamella clarifiers, solids storage tank and wash water reclaim tank would continue to discharge to the existing sewer system. A new sanitary sewer lift station may be added, if needed, southeast of the new Solids Dewatering Building to convey flows from this new on-site sewer network to the County sewer main. If the sanitary flows cannot flow via gravity a sanitary sewer lift station would be installed and would include a precast wet well, a control panel, two submersible pumps with a unit capacity of 160-200 gallons per minute, flow meter, and a valve vault. Sewage would be pumped east toward Graham Hill Road within the entrance to the GHWTP through a new 4-inch force main.

An existing 12-inch gravity sewer main manhole in Graham Hill Road in front of the GHWTP entrance drive is expected to be the discharge point for the new 4-inch sewer force main from the new sanitary lift station (if needed). The anticipated flow for the proposed 4-inch force main is estimated to be up to 200 gpm during peak conditions. A sewer connection permit and wastewater discharge permit issued by Santa Cruz County, as well as Local Agency Formation Commission (LAFCO) authorization, may be required for the City connection to the existing County 12-inch gravity sewer main.

Replace Existing City Sewer Line

If the new sewer connection to the County's existing 12-inch gravity sewer main within Graham Hill Road is not approved, the City would pursue upsizing the existing 4-inch Ocean Street Extension sewer lateral. While the existing 4-inch Ocean Street Extension sewer lateral appears to be in good condition, it is undersized for the necessary sewer discharge flows that the Proposed Project would generate under certain conditions. Upsizing the line to a 6-inch sewer lateral would address this capacity issue. The pipeline would be installed within the paved right-of-way, which is 14- to 16-feet wide using open trenching; the typical width of trench disturbance would be 3 feet and the depth of the trench would be up to 6 feet.

Stormwater Management Improvements

The Proposed Project stormwater management improvements include those required to comply with state and local stormwater regulations, as well as replacement or rehabilitation of some or all of the storm drain line that runs from the GHWTP to the San Lorenzo River. These improvements are described herein.

Stormwater Management Site Improvements

As part of project improvements, water treatment- and storage-related stormwater features would be constructed in several areas. As part of this work, the existing stormwater collection system would be updated to accommodate collection of runoff from new impervious surfaces. In areas where runoff is anticipated to increase due to the construction of new impervious surfaces over previously unpaved or non-building footprint areas, stormwater treatment features are planned to be integrated with the improvements. In the proposed development area at the GHWTP there is approximately 127,109 square feet of existing impervious surfaces (e.g., roads, other pavement, buildings) and the Proposed Project would result in a total of approximately 149,513 square feet of impervious surfaces for a net increase of 22,404 square feet of impervious surfaces. Additionally, the Proposed Project would include 85,269 square feet of net impervious surfaces (including new and replaced impervious area).

The Proposed Project would comply with the Stormwater Management Requirements per the Central Coast Regional Water Quality Control Board and State of California General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems, as described in Chapter 6B of the Best Management Practices (BMP) Manual for the City's Storm Water Management Program (City of Santa Cruz 2014). Preliminary calculations suggest that post-construction BMP requirements would include Tiers 1 through 4 given the amount of replaced and new impervious surfacing.[12] All four tiers are required, if feasible, if new and replacement impervious area is equal to or exceeds 22,500 square feet.

A site-specific hydrology study was performed to evaluate site requirements and to develop the proposed low impact development and stormwater control measures (SCMs) needed to meet those requirements (AECOM/W.M. Lyles Co. 2023). On-site infiltration testing was also conducted by AECOM in April 2023, which found that infiltration on site is not technically feasible. Responsive to these site limitations, the proposed SCMs include use of permeable pavement areas with underlying storage galleries as permanent stormwater control features to be included in the final design. The planned SCMs are capable of meeting Tier 1, 2, and 4 requirements; however, the planned site improvements would require on the order of 13,649 cubic feet of detention storage volume to comply with Tier 3,

[12] Tier 1 = Use of low impact development best management practices storm water control measures; Tier 2 = Collection and treatment of 85th percentile rainfall (1.35 inch) via infiltration or evaporation; Tier 3 = Retention of 95th percentile 24-hour rainfall volume (2.25 inch); and Tier 4 = Routing of 95th percentile rain event while not exceeding pre-developed 10-year/24-hour rain event flowrate (City of Santa Cruz 2014).

which is infeasible. However, the City's Storm Water BMP Manual allows for alternative compliance for projects with technical infeasibility, as is the case for the Proposed Project. Therefore, alternative compliance is proposed by providing 10% of the Proposed Project's Equivalent Impervious Surface Area dedicated to retention-based SCMs consistent with City requirements.

In addition to BMP requirements needed for compliance, the Proposed Project would incorporate the required source control BMP measures in the stormwater control plans, and operation and maintenance plans. The source control measures include, but are not limited to, storm drain stenciling, prohibition of direct connections to storm drains from chemical unloading areas, material storage area requirements, trash storage area requirements, proper design of vehicle wash areas, and proper treatment of condensate line and fire sprinkler drain lines.

The proposed site grading would promote positive drainage conditions away from building and structure foundations. For pavement areas, the pavement grades would be between 1.5 percent and 4 percent, with positive slopes toward drainage inlets and gutters. The existing stormwater collection system would be augmented with additional stormwater collection piping and drainage inlets where needed. Site design and construction practices would implement recommendations and BMPs both during construction and after completion.

Replacement/Rehabilitation of Existing Storm Drain Line

The majority of the stormwater collected at the GHWTP combines into an existing, continuous underground storm drain system that discharges directly to the San Lorenzo River. This storm drain line starts at the concrete tanks pad and conveys GHWTP storm water south and westward on a storm drain dedicated to the GHWTP. The existing storm drain line, constructed in 1960, is made of steel pipe with concrete mortar and varies from 18 inches to 24 inches in diameter. A condition assessment of the storm drain line has not been performed due to inaccessibility by active construction and critical water infrastructure. While it is not expected to have deficiencies, if stormwater modeling and/or a condition assessment indicates insufficient capacity or deterioration, the Proposed Project could include replacement or rehabilitation of some or all of the storm drain line.

Electrical, Lighting, HVAC, SCADA, and Alarm Improvements

The facility electrical service from Pacific Gas and Electric Company (PG&E) is brought to the existing substation at the GHWTP which includes a 21.8-kilovolt (kV), 1,200-ampere (A) breaker, and PG&E metering equipment. Before the switchgear in the Electrical Building, the 21.8 kV is reduced to 480 volts that feeds both the Water Quality Lab and the remainder of the GHWTP. The switchgear distributes power throughout the GHWTP, and feeds two local motor control centers in the main Electrical Building. To support the Proposed Project, the electrical distribution system would be expanded with local distribution. New feeder breakers would be installed to sub-feed the Ozone Building, Solids Dewatering Building, Operations and Filter Building, Chemical Storage and Feed Building, and Maintenance Building. The existing 1,500-kilowatt, 480 VAC diesel standby generator would not be modified as a part of the Proposed Project. No additional or replacement backup generators would be required to serve the Proposed Project. As required by California Green Building Standards Code (CALGreen), the upgraded Operations and Filter Building would be made ready for the installation of solar photovoltaic panels in the future.

Existing natural gas infrastructure at the GHWTP would be removed and replaced with electrical infrastructure as part of the Proposed Project. Therefore, no natural gas would be used for space or water heating.

Similar to existing conditions at GHWTP, exterior safety lighting may be installed on the new tanks and along pathways between structures, and along access roads for security and safety purposes. Lighting, using

light-emitting diode (LED) type luminaires, would be provided for the new process areas and electrical spaces. Lighting in the existing and retained facilities would remain. Interior and external lighting would be provided in accordance with Title 24 of the California Energy Code, where applicable and lighting illumination levels would be in accordance with the Illuminating Engineering Society's recommended values. Exterior lighting would be provided at new building exteriors and shall be Dark Sky compliant, which means that fixtures would be fully shielded and emit no light above the horizontal plane. All exterior lights would comply with the LEHCP for Mount Hermon June beetle (MHJB).

To address CBC deficiencies and dated safety and communication equipment and systems, new HVAC systems and telephone/data networks would be installed in new buildings. HVAC equipment would be rooftop mounted or at grade mounted. Automatic control, monitoring, and alarm of HVAC systems would be provided. A new SCADA system and fiber-optic conduits and cables would need to be installed in the upgraded Operations and Filter Building to provide for the proper operations and monitoring of the new and existing processes. New fire alarm system notification/detection devices would be provided at each new building in accordance with the local codes and requirements of the City of Santa Cruz fire department.

Vehicular Access Improvements

The Proposed Project would include internal vehicular access improvements within the GHWTP site to allow for truck traffic circulation for chemical delivery trucks, fire trucks, dewatered solids hauling, and other delivery trucks within the GHWTP site. A total of approximately 75 parking spaces would be included, including permanent, temporary, electrical vehicle and ADA parking. This proposed parking provides a net increase of 23 parking spaces over the existing 52 parking spaces at the GHWTP to address the existing insufficient parking to accommodate employee, visitor, maintenance, and fleet vehicle needs. An increase in the number of parking spots would accommodate the existing need, improve internal congestion, and provide safe, delineated areas for vehicles. Electrical vehicle charging stations would also be provided.

The project site would be secured at vehicle access points using either automatic or manually operated, lockable chain-link fence gates that would be open only during regular business hours. Internal signage would be provided to direct chemical and other delivery and off-haul traffic to the appropriate working areas at the GHWTP and to direct plant personnel and visitors to the appropriate parking areas.

No physical intersection improvements would be required at the Graham Hill Road and Entrance Roadway Intersection, based on a traffic study conducted for the Proposed Project (AECOM/W.M. Lyles Co. 2022b). Specifically, given the low driveway vehicle volumes, the signal warrant is not met under existing conditions and would not be met under Proposed Project conditions.[13] The GHWTP entrance driveway corner sight distance to the north of the intersection is inadequate but can be improved with vegetation removal. Additionally, traffic calming measures may be installed on Graham Hill Road and could include installing warning signs on both approaches to the Graham Hill Road and Entrance Roadway Intersection, to warn approaching drivers of the presence of the GHWTP driveway; and markings/striping of transverse strips or optical bars to encourage drivers to reduce speed.

Screening and Landscaping Improvements

The Proposed Project would remove existing trees to accommodate new and upgraded facilities at the GHWTP. Of the trees to be removed, up to 45 trees may be heritage trees under Chapter 9.56 of the City Municipal Code

[13] A signal warrant is the minimum condition or criteria that an intersection must meet to justify installation of a traffic signal.

(Heritage Tree Ordinance), which defines heritage trees by size, historical significance, and/or horticultural significance. City regulations require replacement of approved heritage tree removals by replanting three 15-gallon or one 24-inch-box size specimen or the current value, or by contributing to the in-lieu fee program allowed by the ordinance called the Tree Trust Fund. Removal would be permitted by the City under a Heritage Tree & Street Tree Permit if found to be in accordance with the ordinance criteria, which has provisions for construction projects (see Section 3.4.5.3, Local Approvals).

The Proposed Project would include screening and landscaping improvements using locally native, fire resistant,[14] and drought-tolerant species around the upgraded Operations and Filter Building, and in areas where screening and erosion control would be important. Any new tree plantings would count towards the required tree replacements under the ordinance. Specific plants and soil types would be recommended for any bioretention and/or bioswale features that may be necessary to accommodate potentially extended periods of inundation, and resultant higher soil moisture levels associated with the collection and treatment of stormwater. If green roof areas would be implemented,[15] a suitable range of plant types would be evaluated for use with a specific roof-plant-drainage system. Hardscaping would also be provided using crushed stone and river cobbles to assist stormwater infiltration and reduce irrigation needs.

Fencing and Site Security Improvements

The upgraded GHWTP with the Proposed Project would be fully contained within the existing site. Proposed Project site security improvements, if implemented, could include portions of new 6-foot perimeter fencing composed of wrought-iron and closed-circuit television surveillance, to harden the facility and to maximize the safety of GHWTP personnel. An interior fence would be constructed around the pretreatment process area similar to existing conditions and would be a chain-link fence with barbed wire.

3.4.3 Project Operations and Maintenance

Except for very limited planned and unplanned outages, the GHWTP would continue to operate 24 hours a day, 365 days a year, as is the case under existing conditions. Operation and maintenance of the upgraded GHWTP with the Proposed Project would include many activities largely consistent with current activities. These operation and maintenance activities include monitoring and controlling the GHWTP flow, chemical feed systems, filtration process, lamella clarifiers, and equipment functions including monitoring of SCADA system and alarms; testing water samples; filter backwashing practices; sedimentation basin sludge removal; managing and handling chemical deliveries; maintaining equipment; in-kind replacement and repair of equipment and facilities; trash and recycling pick-ups; and maintaining the grounds. All of these activities take place as needed and are not necessarily restricted to certain hours of the day, as under existing conditions.

The new processes (e.g., ozone contact, future GAC adsorption, portions of the solids handling system) would require additional operations support, as well as additional maintenance requirements. The new solids process would require potable water for cleaning the dewatering centrifuge and hosing down the trucking bay and dewatered solids would require trucking for off-site disposal and operating the centrifuge. Additional chemical deliveries would be required to support the new processes. The ozone contact system would include pumps and equipment that require periodic repairs and potential replacement to support continued operation The new GAC contactors would require periodic removal and replacement of the GAC media. Additionally, if UV disinfection is

[14] New landscaping would meet the City of Santa Cruz fire-resistant landscaping requirements.
[15] Green roofs are roofs with a water proofing membrane, soil, and plants that overly a traditional roof to provide green space.

implemented in the future, the UV lamps and electronic ballast would require periodic cleaning and replacement. While additional operations and maintenance requirements would result with the Proposed Project, it is anticipated that no new staff would need to be hired to perform the work.

After construction, it is anticipated that during normal operations, the new wash storage water tank (i.e., 500,000-gallon tank) would be in operation to provide storage for backwash water and supply water for the water distribution system. During maintenance periods, the maintenance tank (i.e., the 150,000-gallon tank) would be in service, while maintenance on the new wash water storage tank takes place. Having two tanks would provide redundancy, increased reliability, and the ability to conduct routine maintenance.

3.4.4 Project Construction

3.4.4.1 Construction Schedule and Sequencing

A consideration of the Proposed Project is the Concrete Tanks Replacement Project (Concrete Tanks Project), which is currently under construction. The Concrete Tanks Project will be completed, or nearly complete, prior to the commencement of the Proposed Project construction in 2025. The Proposed Project would be integrated with the new infrastructure in place at the completion of the Concrete Tanks Project. The major elements of the Concrete Tanks Project include a new treated water storage tank with an internal baffled chlorine contactor (racetrack), a new solids storage tank and pump station, a new wash water reclaim tank and pump station, a new Electrical Building, and roadway improvements. The Concrete Tanks Project is considered in this EIR as a component of the cumulative analysis, as described in Section 4.0, Introduction to Analysis.

The Proposed Project construction is anticipated to commence in phases over a four-year period (from approximately 2025 through 2029) while generally maintaining ongoing operations. As the only surface water treatment plant servicing the City's water service area, the construction sequencing would generally maintain a continuously operating water treatment plant that produces potable water in accordance with all local, state, and federal permit requirements.

Construction would typically occur during normal weekday work hours, between 8:00 AM and 6:00 PM, with potential work outside of those hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36 (e). Specifically, up to 25 planned plant shutdowns are anticipated over the course of the four-year construction period to allow for required construction activities to occur. These shutdowns would vary with up to 14 shutdowns ranging between 4 and 8 hours and scheduled between 7:00 AM and 7:00 PM; and up to 11 shutdowns ranging between 8 and 24 hours in length with no restrictions on scheduled hours.

Construction would include, but not be limited to: procurement of all materials and equipment; mobilization of construction personnel and equipment to the project site; installation of the stormwater pollution prevention plan (SWPPP) BMPs (see below); demolition of existing buildings and infrastructure that would not be retained with the Proposed Project (see below); tree and vegetation removal in development areas; site preparation including clearing, grubbing, excavation/fill, and grading; foundation installation and construction of new buildings; construction and installation of process equipment and tanks; trenching and installation of new yard piping and conduit; paving in roadway, paths and parking areas; and landscaping, fencing, and signage. Given the need to maintain the operation of the plant during construction, these construction activities would be sequenced in phases

to allow for continued operation. Start-up and testing of processes and equipment would take place as each element of the Proposed Project is completed.

As the Proposed Project would disturb more than 1 acre of land, the construction contractors would be required to adhere to the National Pollution Discharge Elimination System Construction General Permit, which mandates preparation and implementation of a SWPPP. The SWPPP would include detailed BMPs to provide erosion control and hazardous materials measures for all construction activities. 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 (see Section 3.4.4.4, Standard Construction Practices).

The Proposed Project would include demolition of some existing buildings, water treatment facilities (e.g., a portion of the existing sedimentation basins), and some of the existing infrastructure, as needed, to address facilities beyond their useful life or to accommodate new facilities. Demolition activities would include removal of an abandoned in-place septic tank located underground in a paved area in the southwest corner of the GHWTP parcel. The above grade portions of the existing Operations and Filter Building would be removed. Demolition activities would occur in a phased manner as construction progresses given the need to keep the GHWTP operational during construction. Prior to demolition, the presence of hazardous building materials (e.g., asbestos) and potentially contaminated soil and groundwater would be fully assessed, and all materials and soil would be properly removed and disposed of according to the recommendations of the Asbestos and Lead-Based Paint Survey Report and the Contaminated Soils and Groundwater Testing and Evaluation Technical Memorandum prepared for the Proposed Project. All removal activities would also be in accordance with all applicable regulatory requirements.

3.4.4.2 Project Access and Staging

Two staging areas, Mt. Hermon Road staging area and Ocean Street Extension staging area, would be used during construction of the Proposed Project. From the Mt. Hermon Road staging area, access to the primary project site would be provided from Mt. Hermon Road to Graham Hill Road. From the Ocean Street Extension staging area, access to the primary project site would be provided from Ocean Street Extension to Graham Hill Road. A traffic control plan would be implemented during construction to manage work in any public right-of-way to maintain safe vehicle and emergency access during all periods of construction.

In addition, locations within the GHWTP site would also be used for temporary staging, laydown of equipment and/or storage during construction. During the construction phase, numerous structures, buildings, pipelines, and civil improvements would be constructed throughout the existing GHWTP. Performing this work would require careful logistical planning and coordination with plant staff so that operational continuity is maintained, and access is provided for all necessary personnel. Specific staging requirements for each process area would be defined as the Proposed Project advances through design.

3.4.4.3 Construction Equipment

Construction equipment would be used throughout the construction of the Proposed Project and would include equipment used on the primary project site to construct the facilities, as well as haul, vendor, and construction labor trucks and vehicles that would be travelling to or between the primary project site and the staging areas. Standard construction equipment would be used on the primary project site including, but not limited to, dozers,

excavators, tractors, loaders, backhoes, saws, graders, scrapers, forklifts, cranes, welders, pavers, rollers, air compressors, compactors, pumps, and generators.

3.4.4.4 Standard Construction Practices

The City has identified standard construction practices that would be implemented by the City and/ or its contractors during construction activities to provide erosion and air quality controls, water quality and habitat protection, inadvertent discovery of cultural resources, construction noise practices, and fire safety measures. These practices, measures, and controls are as follows:

1. **Erosion Control.** Implement and maintain effective erosion and sediment control measures at all times of the year. Measures may include:
   a. Install silt fencing, fiber rolls or straw wattles, and/or rice straw bales on slopes and along limits of work/construction areas to break up and filter surface runoff.
   b. Utilize additional erosion control including native duff, jute netting, etc.
   c. Utilize additional sediment control including fencing, dams, barriers, berms, traps, and associated basins.
   d. Cover of stockpiled spoils.
   e. Install rolling dips and revegetation on temporary accessways.
   f. Physical stabilization/revegetation of disturbed or graded areas including staging areas, prioritizing the use of native species for revegetation where appropriate.
   g. Install sediment containment measures for all active and inactive stockpiles, spoil disposal sites, concrete wash sites, stabilization structures, and other debris areas, such as Visqueen plastic sheeting, fiber or straw wattles, gravel bags, and hydroseed.
   h. Locate construction storage areas outside of any stream channel, and a minimum distance of 65 feet away from any jurisdictional aquatic resource.
   i. All erosion and sediment control materials shall avoid the use of plastic mesh.
   j. Prior to forecasted and following all rain events, all erosion and sediment control devices shall be inspected for their performance and repaired or replaced immediately if they are found to be deficient.

2. **Restoration.** Implement post-construction restoration on temporarily disturbed areas such as staging, new access routes, or work areas. Post-construction restoration may include:
   a. De-compact soils if necessary.
   b. Restore disturbed natural communities by replanting native species appropriate for the site, such as from native riparian, wetland, or upland communities. Planted material may include native seed mixes, pole cuttings, and/or container stock as appropriate.

3. **Wind Erosion Control.** Implement wind erosion control measures as necessary to prevent construction-related dust generation. Measures may include:
   a. Water active construction areas to control fugitive dust.
   b. Apply hydroseed and/or non-toxic soil binders to exposed cut and fill areas after cut and fill operations.
   c. Cover inactive storage piles.
   d. Cover trucks hauling dirt, sand, or loose materials off site.
   e. Install appropriately effective track-out capture methods at the construction site for all exiting vehicles.

4. **Trash Control.** Implement housekeeping measures to manage trash and debris pollution. These measures may include:
   a. Use covered trash containers.
   b. Clean up trash from the work site daily and before an extended period of no construction activity, including weekends.
   c. Ensure all trash and debris is removed from the work area at the end of construction activities.

5. **Containment of Work Area (Spill Prevention).** Implement hazardous materials containment measures to prevent fuel, oil, or any other substances from polluting aquatic or terrestrial habitats. Measures may include:
   a. Prepare a spill response plan to allow a prompt and effective response to any accidental spills.
   b. Inform all workers of the importance of preventing spills and the appropriate measures to take in the event of a spill.
   c. Ensure emergency spill kits are available on site at all times.
   d. Locate refueling, maintenance, and staging a minimum distance of 65 feet away from any jurisdictional aquatic resource.
   e. Store hazardous materials within an established containment area and store all gas, oil, or other substance that could be considered hazardous in water-tight containers within secondary containment.
   f. Implement appropriate containment measures to minimize the potential for hazardous spills from heavy equipment such as external grease and oil or from leaking hydraulic fluid, fuel, or oil.
   g. Check all equipment daily for leaks.

6. **Worker Training.** Provide a worker environmental awareness program (WEAP), prior to the onset of any mobilization-construction activities within the project work area. All construction personnel shall take the in-person or video training prior to on-site work, and any additional personnel joining the work crew shall receive the same training before beginning work. All personnel shall sign a sign-in sheet showing that they received the training. A qualified person shall be available after the training to answer any questions the crew may have. At a minimum the training or presentation, by a qualified biologist, shall include:
   a. Description of project boundaries.
   b. General provisions of the Migratory Bird Treaty Act, California Fish and Game Code, federal and state Endangered Species Acts, local ordinances and code, and any permits covering the work area.
   c. The necessity for adhering to the provision of these regulations.
   d. General measures for the protection of special-status species, including breeding birds and their nests.
   e. Basic identification and importance of special-status species that may occur on or near the project site.
   f. The special-status species habitat and how they may be encountered in the work area.
   g. Procedures to follow when they are encountered.

7. **Construction Monitoring.** Conduct pre-construction clearance surveys, construction monitoring, and delineate work areas as required by species-specific measures in the City's Operations and Maintenance HCP, Anadromous Salmonid HCP, and LEHCP for MHJB for all sites covered by a respective HCP when there is potential for impact to subject species.

8. **Vegetation Protection (Trees).** To protect on-site vegetation, implement the following measures:
   a. Minimize the potential for pathogen spread by sanitizing tools and equipment used in vegetation clearing including tree removal operations.
   b. If soil is collected on equipment, rinse equipment on site to remove soil-borne pathogens and prevent transport to new sites. Alternatively, debris can be cleaned from tools/equipment via brushing, sweeping, or blowing with compressed air.
   c. If importing vegetative material for restoration purposes, ensure that material that has been produced in conformance with the latest horticultural standards in pest and disease avoidance and sanitation.
   d. Where applicable implement project specific tree protection recommendations from an ISA Certified Arborist or a Registered Professional Forester.

9. **Vegetation Protection (Riparian).** Minimize impacts to riparian vegetation when working in or adjacent to an active stream channel by implementing avoidance and minimization measures. These measures may include:
   a. Avoid disturbance to and limit pruning of existing vegetation whenever possible.
   b. Minimize removal of overstory trees that provide shade to the stream channel or banks through marking trees that are not to be removed.
   c. Trim vegetation using hand tools and maintain canopy, downed trees, and snags to the extent possible.
   d. Limit management of vegetation that is stabilizing the stream banks to trimming and pruning.
   e. Demarcate temporary access routes to limit extent of impacts.
   f. Restore impacted riparian vegetation with native species appropriate for the site.

10. **In-Channel Erosion and Sedimentation Control.** Implement streambed and bank protection measures for construction activities that are in or adjacent to streams and drainages. These measures may include:
    a. Avoid activities in any active flowing channels when possible.
    b. Time work during the low flow season (June–October) when possible, to avoid work in a wetted channel.
    c. Utilize equipment or methods that do not require access in the channel.
    d. If work within a wetted channel cannot be avoided, isolate and temporarily bypass flowing water around work area before beginning work.
    e. Select appropriate equipment to minimize disturbances such as tracked or wheeled vehicles depending on site conditions.
    f. Use “floating” platforms to distribute the weight of heavy equipment during mobilization in saturated soils.

11. **In-Channel Fish Species Protection.** Decontaminate tools and equipment prior to entering waterways.
12. **In-Channel Dewatering Measures.** Implement dewatering measures for projects that cannot avoid working in a flowing stream. Measures may include:
    a. Isolate the work area from the stream by diverting the entire streamflow around or through the work area by a pipe or open channel.
    b. The work area shall remain isolated from flowing water until any necessary erosion protection is in place.
    c. Where feasible, techniques shall be used to allow stream flow by gravity.
    d. All diversions shall maintain ambient flows.
    e. All water shall be discharged in a non-erosive manner using energy dissipators such as on:
       i. Gravel or vegetated bars.

ii. Haybales, plastic, concrete.

iii. In storm drains when equipped with filtering devices.

f. All discharged water below the work area shall not be diminished or degraded by the diversion.

g. Dirt, dust, or potential discharge material in the work area will be contained and prevented from entering the flowing channel.

h. Removal of all foreign materials and temporary diversion structures such as, temporary fills, access ramps, diversion structures, or coffer dams shall be removed:

i. When the work is complete.

ii. As soon as reasonably possible, but no more than 72 hours after work is complete.

i. Normal flows shall be restored to the affected stream as soon as is feasible or safe after completion.

j. If water must be pumped around the work area, as gravity flow is not feasible:

i. Pumps and hoses shall be screened to prevent vertebrate intake.

ii. Sumps or basins may be used where appropriate to collect water (e.g., in channel with low flows).

k. If a bypass diversion will be open channel design, the berm confining the channel may be constructed of material from the channel.

l. Suitable site-specific conditions for a coffer dam installation up and downstream include:

i. Proximity to the construction zone.

ii. Type of construction activities to be conducted.

m. If coffer dams installation is determined to be suitable for the site, construction shall be adequate to prevent seepage into or from the work area to the maximum extent feasible.

13. In-Channel Species Capture and Relocation. Implement aquatic species capture and relocation during temporary water diversion to the extent feasible to minimize the potential for killing or harming native aquatic vertebrates in the work area. If the safety of the biologist conducting the capture may be compromised or if the equipment or gear is not reasonably effective for the operation, relocation is not required. Measures may include:

a. Work area may be isolated using fine mesh or block nets.

b. Methods of removal will be determined based on the site conditions but may include electrofishing, dipnet, or seine.

c. Relocation shall be done by a qualified biologist.

d. Relocation shall be located in a nearby suitable habitat.

e. Handling and holding time will be minimized to the maximum extent practicable.

f. As the work site is de-watered, the remaining pools will be inspected for presence of aquatic species suitable for relocation.

14. In-Channel Restoration. Implement post-construction streambed and bank measures unless the pre-existing condition was detrimental to the channel condition as determined by a qualified biologist or hydrologist. Measures may include:

a. Return streambed to as close to pre-project condition as possible.

b. Return stream contours to original condition.

15. **Archaeological Resources.** 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 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:
    a. 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 any federal lead agency and is contingent on the approved course of action in response to the discovery.
    b. Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager.
    c. 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.
    d. 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.
    e. 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 NRHP 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.
    f. 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.
    g. 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.
    h. 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.

i. A full written report will be prepared to include the results of all technical analyses and special studies 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.

16. **Archaeological Resources (Human Remains).** 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.
    a. 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.
    b. 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.
    c. 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.
    d. 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.
    e. The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).
    f. 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.

17. **Nighttime Construction.** For nighttime construction between the hours of 10:00 PM and 8:00 AM, notice of the dates and times nighttime tasks will be undertaken shall be provided to all residents, tenants and property owners who occupy or own property within 300 feet of the construction site at which such tasks will be performed. A Construction Noise Coordinator will be identified and the contact number for the 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. For construction in City limits, construction activities will comply with the City of Santa Cruz Municipal Code Section 9.36.

18. **Fire Suppression.** For construction in wildlands or in the wildland–urban interface,[16] internal combustion engine equipment shall include spark arrestors, fire suppression equipment (e.g. fire extinguishers and shovels) shall be stored on site 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/).
19. **Preconstruction Nesting Bird Surveys.** Vegetation removal activities shall be conducted outside the bird nesting season (February 1 through August 31) as possible to avoid direct impacts to nesting birds. For construction and vegetation removal activities occurring during the nesting season, a preconstruction survey of the work areas for active bird nests shall be conducted by a qualified wildlife biologist no more than seven days prior to the start of vegetation removal or construction activities. Once construction has started, if there is a break in activities that exceeds seven days, another survey shall be conducted. If at any time during construction or vegetation removal activities an active bird nest is found, the nest shall be flagged and the biologist shall determine an appropriate no-disturbance buffer based on the species' sensitivity to disturbance. The buffer shall be avoided until the nest is vacated or the young 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. If construction and vegetation removal activities do occur during the nesting season, the City may consider the use of decoys (e.g., owls or raptors) or noise makers at the beginning of the nesting season to limit or avoid nesting activities in proximity to construction sites.
20. **Cultural Resources Training.** Provide a cultural resource sensitivity training for workers prior to conducting earth disturbance in the vicinity of a documented cultural-resource-sensitive area. Prior to site mobilization or construction activities, a qualified archaeologist (as defined in SCP#15[c]) with training and experience in California prehistory and historical-period archaeology shall conduct the cultural resources awareness training for all construction personnel. The training format may be in person, virtual, or a video recording. The training shall address the identification of buried cultural deposits, including Native American and historical-period archaeological deposits and potential tribal cultural resources, and cover identification of typical prehistoric archaeological site components including midden soil, lithic debris, and dietary remains as well as typical historical-period remains such as glass and ceramics. The training will also explain procedures for stopping work if suspected resources are encountered. Any personnel joining the work crew subsequent to the training shall also receive the same training before beginning work.
21. **Construction Equipment Exhaust Control.** For projects utilizing off-road diesel-fueled equipment within 750 feet of sensitive receptors for more than one-year, all diesel-fueled off-road construction equipment greater than 75 horsepower shall be zero-emissions or equipped with California Air Resources Board (CARB) Tier 4 Final or Interim compliant engines. Alternatively, CARB Tier 2 or Tier 3 compliant engines can be used if CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS) filters are added to each piece of off-road diesel-fueled equipment. An exemption from these requirements may be granted by the City of Santa Cruz, at the Water Director's discretion, when equipment with the required tier is not reasonably available and when corresponding reductions in diesel particulate matter are achieved from other construction equipment on the project. An exemption may only be granted if total estimated project-generated construction emissions will not exceed applicable Monterey Bay Air Resources District

[16] Given that the primary project site and staging areas are either within or immediately adjacent to the wildland–urban interface, this practice would apply to all elements of the Proposed Project.

(MBARD) risk thresholds as verified using industry-standard emission estimation methodologies. This measure does not apply to linear projects (e.g., pipelines) as sensitive receptors would not be exposed for long durations.

3.4.4.5 HCP Minimization and Mitigation Measures

The City has an LEHCP that covers incidental take at the GHWTP for MHJB, Zayante bandwinged grasshopper, and Ben Lomond spineflower and also provides for protection of Zayante sandhills/Maritime Coast Range Ponderosa Pine Forest habitat (City of Santa Cruz 2013). The LEHCP is incorporated by reference into this EIR and summarized below.

MHJB is known to occur on the GHWTP property, and the other two listed species could potentially occur on the property due to the presence of appropriate soils and habitat. The LEHCP 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. In the western portion of the site, the soil type is classified as Zayante soils, which is typically similar in texture and other soil properties to beach sand. Because of long-term human use and farming, the current soils in this area are texturally a loam, and not sand (AECOM/W.M. Lyles Co. 2022a). However, most of the project construction work would be done outside of the area classified as Zayante soils. The Proposed Project would comply with the terms set forth in the LEHCP, including those for incidental "take" from Proposed Project activities that include the inclusion of avoidance and minimization measures, and compliance with identified mitigation measures (see below). In accordance with the LEHCP, compliance monitoring by a qualified biologist would occur throughout all construction activities and operations and maintenance activities in suitable or occupied MHJB habitat. The qualified biologist would monitor the implementation of the following measures. The qualified biologist would also be responsible for effects monitoring, which would include the calculation of areas of habitat disturbance and the number, if any, of individual MHJB relocated. All information gathered by the biologist would be included in the LEHCP annual report prepared by the City for the USFWS. The following measures are from the existing LEHCP and are incorporated into the Proposed Project.

- **Measure 1: Locate Project Activities on and Adjacent to Current Development.** To the extent practical, the covered activities of the HCP that occur on the portion of the project area characterized by Zayante sands will be located either within, or immediately adjacent to, the footprint of the existing GHWTP facilities (e.g., existing buildings, water tanks, service roads, pipelines).[17]
- **Measure 2: Delineate Boundaries of the Impact Area.** Temporary fencing and signs will be erected before any vegetation clearing, excavation, or grading activities occur to clearly delineate the boundaries of the project's impact area between areas disturbed by construction activities and those that will remain in existing conditions, specifically in the northern and western perimeters of the project area. Warning signs will be posted on the temporary fencing to alert workers not to proceed beyond the fence. All protective fencing will remain in place until the construction activities have been completed. Signs will include the following language: "NOTICE: SENSITIVE HABITAT AREA. DO NOT ENTER."
- **Measure 3: Cover Exposed Soils.** Adult males of the MHJB actively search for breeding females during the evenings between about May 15 and August 15. During this period, both sexes burrow into duff and Zayante sandy soils during the daytime for refuge until the following night's flight. If construction or other ground disturbing activities occur during any portion of the MHJB flight season, all exposed Zayante soils within the impact area will be covered by tarps, plywood, erosion control fabric, or another suitable impervious material. Exposed soils should be covered between the hours of 7:00 PM and 7:00 AM daily by a qualified

[17] Zayante sands and Zayante soils are used interchangeably.

biologist. This will prevent adult males from burrowing into the exposed soils and subsequently being injured or killed by soil disturbance (digging, grading, covering, etc.).

- **Measure 4: Dust Control.** Appropriate dust control measures, such as periodically wetting down the work areas, will be used as necessary during excavation or any soil disturbing activities in the impact area or any other covered activities that generate dust.
- **Measure 5: New Outdoor Lighting.** Adult MHJBs are active at dusk and may be distracted by incandescent, mercury vapor, sodium, and black light sources, which can disrupt normal behaviors and breeding activities. Thus, any new outdoor lighting installed as part of this project will use bulbs certified to not attract nocturnal insects.
- **Measure 6: Landscaping Elements That Degrade MHJB Habitat.** Because MHJB adults emerge from the soil to attract and search for mates, turf grass, dense ground covers (such as ivy), weed matting, aggregate, and mulch can degrade habitat conditions and will not be used in this project. Material for revegetation will use plants endemic to the Zayante Sandhills.
- **Measure 7: Revegetate Temporary Habitat Loss with Native Sandhills Plants.** Some areas at the water treatment facility will be temporarily cleared of vegetation or graded but will not support any new structures or other hardscape after a covered activity has been completed. After completion of such covered activities the impact area(s) will be revegetated with plants native to the Zayante Sandhills. Suggested sandhills plants include sticky monkeyflower, deer weed (*Lotus scoparius*), silver bush lupine (*Lupinus albifrons* var. *albifrons*), ponderosa pine, and coast live oak. Other sandhill endemic plants may be appropriate depending upon the location of the impact area and soil conditions. These native plants will provide suitable habitat conditions for MHJBs that might eventually colonize the temporarily impacted portion of the impact area. As previously noted, revegetated areas should not include any landscape elements that degrade habitat for the MHJB, including mulch, bark, weed matting, rock, aggregate, or turf grass.

3.4.5 Project Permits and Approvals

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, and adoption of CEQA Findings and the Mitigation Monitoring and Reporting Program with recommendations to be provided to the Council from the Water Commission regarding EIR certification and from the Planning Commission regarding the Proposed Project entitlements. In addition to CEQA, the Proposed Project would be subject to compliance and permitting requirements under federal, state, and local regulations. The anticipated agency permits and approvals necessary for the implementation of the Proposed Project are described below. The local approvals are informed by a recent City Staff Report that clarified the City approvals required for the Proposed Project (City of Santa Cruz 2023).

3.4.5.1 Federal Approvals

The anticipated federal agency permits and consultations include:

- **U.S. Army Corps of Engineers.** Federal agency that may issue a Clean Water Act Section 404 permit should construction activities result in fill of waters of the United States (i.e., if the Proposed Project impacts the San Lorenzo River due to storm drain modifications).
- **U.S. Environmental Protection Agency.** Federal agency that would administer and provide funding for the Proposed Project through the Water Infrastructure Finance and Innovation Act (WIFIA) loan program.

- **U.S. Fish and Wildlife Service.** Federal agency that consults with the lead Federal agency (either U.S. Army Corps of Engineers or U.S. Environmental Protection Agency) under Section 7 of the Endangered Species Act for projects that impact sensitive species of fish, wildlife, or their habitat. The City has an LEHCP that covers incidental take at the GHWTP of several species (see Section 3.4.4.5, HCP Minimization and Mitigation Measures).
- **National Marine Fisheries Service.** Federal agency that consults with the lead Federal agency (either U.S. Army Corps of Engineers or U.S. Environmental Protection Agency) under Section 7 of the Endangered Species Act for projects that impact U.S. fisheries. This may be required if the Proposed Project impacts the San Lorenzo River due to storm drain modifications.

3.4.5.2 State Approvals

The anticipated state agency permits, authorizations and consultations include:

- **State Water Resources Control Board, Division of Drinking Water.** Responsible Agency for issuing a Domestic Water Supply Permit Amendment.
- **State Water Resources Control Board, Division of Financial Assistance.** Responsible Agency if the Proposed Project obtains financing through the Drinking Water State Revolving Fund (SRF) Program.
- **California Department of Fish and Wildlife.** Trustee Agency for projects that may affect fish, wildlife, or their habitat and potentially a Responsible Agency for issuing a Lake and Streambed Alteration Agreement should construction activities result in fill of waters of the state if the Proposed Project impacts the San Lorenzo River due to storm drain modifications.
- **Central Coast Regional Water Quality Control Board.** Responsible Agency for approval of a Clean Water Act Section 401 Water Quality Certification Permit in areas of impacts to waters or wetlands of the United States, if the Proposed Project impacts the San Lorenzo River due to storm drain modifications. Also, the Regional Water Quality Control Board would oversee the City's Notice of Intent to Comply with the National Pollutant Discharge Elimination System Construction General Permit.
- **Monterey Bay Air Resources District.** Authority to Construct, Modify Existing Permit, Permit to Operate. Responsible Agency for Authority to Construct and Permit to Operate for any new generators or other stationary sources of air emissions. MBARD requires permits for any new or modified machine, equipment, or other device that may emit any of the criteria air pollutants, any of the toxic air contaminants, or odorous pollutants. In addition, any abatement device that may reduce or eliminate air contaminants must also have a permit. It is expected that two types of permits would be issued for the Proposed Project the Authority to Construct and the Permit to Operate. Specifically, the Ozone Building and associated operations and chemical storage tanks would require review and permitting by MBARD. Existing air permits would need to be amended if there are changes to the discharge of air pollutants from the revised processes. Existing air permits for the GHWTP are Permit Numbers 9970, 14520, and 13932.
- **State Historic Preservation Officer.** State agency that consults with the lead Federal agency (either U.S. Army Corps of Engineers or U.S. Environmental Protection Agency) under Section 106 of the National Historic Preservation Act for projects that impact designated or eligible historic resources.

3.4.5.3 Local Approvals

The anticipated local agency permits and authorizations include:

- **City of Santa Cruz, Building and Safety.** Building Permit (includes Green Building), only where not otherwise exempted from State law.
- **City of Santa Cruz, Park and Recreation Department.** Heritage Tree & Street Tree Permit.
- **City of Santa Cruz, Planning Department.** Design Permit and Special Use Permit for the upgraded Operations and Filter Building; the remainder of the Proposed Project is exempt from these permitting requirements under the California Government Code Section 53091(e).
- **City of Santa Cruz, Public Works, Stormwater.** Stormwater Control Plan.
- **City of Santa Cruz, Public Works, Traffic.** Temporary Encroachment Permit & Traffic Control Plans.
- **City of Santa Cruz, Public Works, Wastewater.** Wastewater Discharge Permit Amendment may be required.
- **County of Santa Cruz, Environmental Health Department, Certified Unified Program Agency.** Hazardous Materials Management Plan Amendment and Septic Tank Deconstruction Application.
- **Santa Cruz County, Public Works Department.** Encroachment Permit Traffic Control Permit.
- **Santa Cruz County, Public Works Department Sanitation.** Sewer Connection Permit & Waste Discharge Permit. Responsible Agency for issuing a Sewer Connection Permit and Wastewater Discharge permit if the Proposed Project connects to the County sewer main in Graham Hill Road. County of Santa Cruz would issue an encroachment permit for any work in Graham Hill Road.
- **Local Agency Formation Commission.** Extraterritorial Service Authorization. Responsible Agency for LAFCO Extraterritorial Service authorization that could be required to receive a single service from County Sanitation if the Proposed Project connects to the County sewer main in Graham Hill Road.

3.5 References

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4 Environmental Setting, Impacts, and Mitigation Measures

4.0 Introduction to Analyses

This chapter provides a project-level analysis of the physical environmental effects of implementing the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The following sections in this chapter evaluate the environmental impacts of the Proposed Project:

- 4.1 — Impacts Not Found to Be Significant
- 4.2 — Aesthetics
- 4.3 — Air Quality
- 4.4 — Biological Resources
- 4.5 — Cultural Resources and Tribal Cultural Resources
- 4.6 — Energy
- 4.7 — Geology and Soils
- 4.8 — Greenhouse Gas Emissions
- 4.9 — Hazards and Hazardous Materials
- 4.10 — Hydrology and Water Quality
- 4.11 — Land Use and Planning
- 4.12 — Noise and Vibration
- 4.13 — Transportation
- 4.14 — Utilities and Service Systems
- 4.15 — 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 conditions related to the topic being addressed, based on the conditions present at the time that the Notice of Preparation (NOP) for the environmental impact report (EIR) was released (2022).
- **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 (City) 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 4.0.4, Cumulative Impacts Overview, 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.
- **Beneficial.** This determination applies if there is a beneficial change in any of the physical conditions within the area affected by the Proposed Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

4.0.3 Scope of Analyses

4.0.3.1 Study Area

As described in Chapter 3, Project Description, the Proposed Project would primarily be constructed and located at the City's existing GHWTP, located within City limits. Additionally, the Proposed Project is anticipated to involve activities outside of the GHWTP for potential utility and traffic safety improvements and for temporary construction staging. These activities would occur in both City and County of Santa Cruz (County) jurisdictions. The Proposed Project is anticipated to be located at four sublocations of the primary project site and construction would be supported using two staging areas, which together constitute the project site.

The 17.1-acre primary project site consists of the GHWTP parcel, which is the site of the existing GHWTP; a utility corridor between the GHWTP parcel and the San Lorenzo River, which contains an existing underground storm drain line; a segment of the Graham Hill Road right-of-way between Mosswood Court and just south of Lyle Way, which contains a segment of the County's existing gravity sewer and other exiting utilities; and an alternative sanitary sewer lateral replacement area from the GHWTP parcel along Ocean Street Extension to the City Public Works Department maintained sanitary sewer connection at Graham Hill Road, which contains a segment of the City's existing sewer lateral.

For most impact topics, the study area includes the area within and adjacent to the project site, as described 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. In accordance with Section 15125 of the State CEQA Guidelines, the EIR examines impacts of the Proposed Project based on the physical environmental conditions as they exist at the time the NOP was released. For the Proposed Project the NOP was released in June 2022, which is the baseline for analyses in this EIR.

The Proposed Project consists of facility improvements at the GHWTP, potential upgrades or replacement of the storm drain line to the San Lorenzo River, potential replacement of a segment of the City's existing sewer lateral in Ocean Street Extension, and potential traffic calming measures on Graham Hill Road (e.g., warning signs at entrance). The design of the facility improvements at the GHWTP are underway. For the remainder of the project components, the analyses consider impacts of installation of the replacement storm drain and sewer pipelines and traffic calming measures within specified construction disturbance corridors shown in Chapter 3, Project Description (Figure 3-2).

The Proposed Project is scheduled to be constructed in phases over a four-year period (2025 through 2029) while maintaining ongoing operations and continuous production of drinking water at GHWTP. The estimated construction schedule, construction equipment, construction staging, and standard construction practices are summarized in Chapter 3, Project Description (Section 3.4.4, Project Construction). Construction would typically occur during normal weekday work hours, between 8:00 AM and 6:00 PM, with potential work outside of those hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36 (e).

4.0.4 Cumulative Impacts Overview

The section below presents the CEQA requirements pertaining to the cumulative analysis and the cumulative projects that have been considered in the cumulative impact analysis presented for each environmental resource topic.

4.0.4.1 CEQA Guidelines Requirements

CEQA Guidelines Section 15130(a) requires that an 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 funds its fair share of a mitigation measure designed to alleviate the cumulative impact. 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 either in an adopted plan that evaluates conditions contributing to cumulative impacts or in a certified environmental document for such a plan. Examples of plans that can be used for such purposes include a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. 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 this 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 Proposed Project 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 water capital investment projects planned by the City that would be located in proximity to the Project site or whose impacts would otherwise combine with the impacts of the Proposed Project. The Draft EIR and Final EIR for the Santa Cruz County Sustainability Update were also reviewed regarding potential cumulative projects that should be considered during the environmental review for the Proposed Project. Additionally, County Planning Department staff were also contacted to determine if other proposed or pending projects are located in proximity to the Project site; based on review of the list provided by County staff there are not any major proposed or pending development projects in the vicinity of the Project site or

within two miles of the Proposed Project. Cumulative projects are discussed below and summarized in Table 4.0-1 at the end of this section.

City of Santa Cruz Water Projects

Capital Investment Program Projects

The City Water Department Capital Investment Program, 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 City's Securing Our Water Future Policy (City of Santa Cruz 2022), as well as the recommendations of the Water Supply Advisory Committee for supplemental water supply, which are incorporated in the 2020 Urban Water Management Plan (City of Santa Cruz 2021a), to which some of these projects relate, including the Proposed Project. Table 4.0-1 reflects the comprehensive list of capital projects pending or under construction that were reviewed for this EIR. Additionally, construction of other capital projects have been recently completed on or in the immediate vicinity of the primary Project site including at the GHWTP (Tube Settler Replacement Project, Flocculator Replacement Project, and GHWTP Driveway Improvement Project), as well as in the immediate vicinity of the primary Project site (Ocean Street Extension Main Replacement and Coast Pump Station Raw Water Main Replacement Project).

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, the City negotiated with the California Department of Fish and Wildlife and the National Marine Fisheries Service 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, 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 completed the Final EIR for the SCWRP in November 2021 and is now waiting for the State Water Resources Control Board to act on the pending water rights modifications. 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 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.

Other Projects

There are several infrastructure and public projects that are proposed in the vicinity of the Proposed Project. These include the Conjunctive Use Plan for the San Lorenzo River Watershed, the Highway 9/San Lorenzo Valley Complete Streets Corridor Plan, the Quail Hollow Road at Zayante Creek Bridge Replacement, and the Quail Hollow Ranch County Park Master Plan Amendment.

These cumulative projects could have construction periods that overlap with the Proposed Project depending on the ultimate timing of construction of these projects. Additionally, the operation of these cumulative projects in conjunction with the operation of the Proposed Project are considered in the cumulative analysis as some of these projects could influence conditions in the San Lorenzo River.

Several other approved or pending development projects in the City, County, and City of Scotts Valley could result in construction periods that overlap with the Proposed Project depending on the ultimate timing of construction of these projects and/or result in cumulative effects within a specific geographic area.

Table 4.0-1. Cumulative Projects

#	Project Name	Project Location	Project Description	Estimated Construction Schedule
City of Santa Cruz Water Projects in Capital Investment Program (CIP)[1]				
1	River Bank Filtration Study	**Southwest of project site** Unincorporated Santa Cruz County	Assesses the feasibility of locating new vertical wells along the San Lorenzo River near the Tait Diversion If found feasible, locations and design parameters for installation of wells would be recommended.	2024-2026
2	Newell Creek Dam Inlet/Outlet Replacement Project	**North of project site** 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 that transports water to the Reservoir from Felton Diversion and from	2020-2023

Table 4.0-1. Cumulative Projects

#	Project Name	Project Location	Project Description	Estimated Construction Schedule
			the Reservoir to the GHWTP. Construction commenced in spring 2020.	
3	Newell Creek Pipeline Improvement Project	**Southern end pipeline terminus at project site** Unincorporated Santa Cruz County, in the Santa Cruz Mountains	Replacement of the Newell Creek Pipeline between the pipeline segment completed as part of the NCD Inlet/Outlet Replacement Project and GHWTP.	2023-2026 2030-2031
4	GHWTP Concrete Tanks Project	**At project site** City of Santa Cruz	Infrastructure improvements to the GHWTP are necessary to meet regulatory requirements, improve operations and increase overall reliability. Construction is underway.	2021-2024
Other Infrastructure Projects				
5	Santa Cruz Water Rights Project	Various Locations in unincorporated Santa Cruz County. Components in proximity to the Proposed Project include: ▪ **Northeast of project site** – Intertie with City of Scotts Valley ▪ **Northwest/ Southwest of project site** - Felton Diversion and Tait 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 (City of Santa Cruz 2021b).	2023-2030
6	Conjunctive Use Plan for the San Lorenzo River Watershed	**North and upstream from project site** Unincorporated Santa Cruz County	The San Lorenzo Valley Water District (SLVWD) and the County of Santa Cruz are developing a Conjunctive Use Plan to increase stream baseflow for fish and increase reliability of surface and ground water supplies for the SLVWD. This project would seek to increase opportunities for SLVWD's independent water systems to allow the distribution systems to utilize surplus surface water from each other, thereby increasing reliability and providing	Unknown

Table 4.0-1. Cumulative Projects

#	Project Name	Project Location	Project Description	Estimated Construction Schedule
			in-lieu recharge to the groundwater aquifers through conjunctive use. Project components identified to date that would seek to allow for conjunctive use within the SLVWD's service areas would include water rights changes, use of existing interties to move water between service areas, and use of SLVWD's Loch Lomond Reservoir contractual rights for specified quantities of reservoir water.	
7	Highway 9/ San Lorenzo Valley Complete Streets Corridor Plan (Hwy 9/SLV Corridor Plan)	**Northwest of project site** Unincorporated Santa Cruz County	The Hwy 9/SLV Corridor Plan is a planning study that provides a vision, guiding principles, and realistic strategies to improve how people get around the San Lorenzo Valley. Priority projects at the southern end of the corridor could potentially overlap with the use of the Mt. Hermon Road Staging Area for the Proposed Project, although implementation timing has not been established. Projects include safety measures, travel demand management projects, bicycle facilities or separated paths, bus turnouts, pedestrian crossing improvements, intersection redesign, roadway maintenance, and emergency preparedness and resiliency projects.	Unknown
8	Quail Hollow Road at Zayante Creek Bridge Replacement	**North of project site** 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. Access to the site would be via Graham Hill Road.	2024
9	Quail Hollow Ranch County Park Master Plan Amendment	**North of project site** Unincorporated Santa Cruz County	Master Plan amendment for new trails, habitat restoration and signage. Access to the site would be via Graham Hill Road.	Unknown
Residential, Commercial, and Mixed-Use Projects				
10	1930 Ocean Street Extension Project	**Southwest of project site** City of Santa Cruz	32 condominium units.	Unknown; approved in September 2018
11	119 Coral Street	**South of project site** City of Santa Cruz	Supportive/Transitional housing-120 residential units with demolition of existing 6 units and support facilities	Unknown, approved 2020
12	La Madrona Mixed-Use Project	**Northeast of project site** City of Scotts Valley	Development of up to a 180-room hotel with 3,500 square feet of commercial and 182 residential units 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	**Northeast of project site** City of Scotts Valley	Mixed-use commercial (25,000 square feet) and residential (52 units) development at Mt. Hermon Road and Glen Canyon (3640 Glen Canyon Drive)	Unknown; project under CEQA review
14	Valley Gardens	**Northeast of project site** City of Scotts Valley	Development of up to 5,000 square feet of commercial and 190 residential units at 263 Mt. Hermon Drive	Unknown; project under CEQA review
15	Encore Condominium Project	**Northeast of project site** City of Scotts Valley	16-unit condominium project	Unknown; Approved
16	Bay Village-Erba Lane	**Northeast of project site** City of Scotts Valley	10-unit single-family home project	Unknown; Approved

Notes:

[1] The Santa Cruz Water Rights Project includes the following CIP projects and therefore these projects are not listed separately above: Felton Diversion and Tait Diversion and Coast Pump Station upgrades, and aquifer storage and recovery in Mid-County and Santa Margarita Groundwater Basins.

4.0.5 References

City of Santa Cruz. 2020a. *Water Department CIP.* Fiscal Years 2020-2024. Water Department.

City of Santa Cruz. 2020b. "Capital Improvement Program." Water Department. Accessed August 19, 2020 at https://www.cityofsantacruz.com/government/city-departments/water/engineering/santa-cruz-water-program.

City of Santa Cruz. 2021a. *2020 Urban Water Management Plan*. October 2021.

City of Santa Cruz. 2021b. *Santa Cruz Water Rights Project Final Environmental Impact Report (SCH# 2018102039).* Prepared by Dudek for the City of Santa Cruz. November 2021.

City of Santa Cruz. 2022. *City Council Policy Number 34.7: Securing Our Water Future Policy Guidance for Water Supply Augmentation to Address Santa Cruz's Water Supply Reliability Issue*s. Adopted November 2022.

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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. This section describes impacts not determined to be significant related to implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). For this EIR, issues related to agriculture and forestry resources, mineral resources, population and housing, public services, and recreation were found not to be significant for the Proposed Project, and are discussed in greater detail below. See Chapter 3, Project Description, for a detailed description of the Proposed Project.

4.1.1 Agriculture and Forestry Resources

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 the GHWTP parcel, alternate sanitary sewer lateral replacement area, Graham Hill Road right-of-way, or the Ocean Street Extension staging area. Furthermore, these areas are not zoned for agricultural uses and are mapped as Urban and Built-Up Land or Other Land by the California Department of Conservation (California Department of Conservation 2018). The utility corridor, which is a part of the primary project site, is located on a parcel that is zoned Commercial Agriculture (CA) by the County. The intent of this zoning district is to preserve the commercial agricultural lands and maintain economic farm units comprising the commercial agricultural areas of the County. Public utilities, such as the existing storm drain line, are allowable uses in this zoning district. The utility corridor is also located on parcels mapped as Other Land by the California Department of Conservation (California Department of Conservation 2018). This farmland category is not included in any other mapping category. Common examples of Other Land include low density rural developments and riparian areas not suitable for livestock grazing.

The Mt. Hermon Road staging area is located on a parcel that is zoned Residential Agricultural (RA) by the County of Santa Cruz (County) and is mapped as Grazing Land by the California Department of Conservation. However, the Mt. Hermon Road staging area is currently used for the storage of construction equipment, materials, and vehicles. While no agricultural or grazing uses currently exist at the proposed Mt. Hermon staging area, prior to this area being used as a staging ground (est. 2020) it was grazed by horses. The continued use of the existing Mt. Hermon Road staging area with storage of construction equipment, materials, and vehicles would not result in the conversion of agricultural lands to non-agricultural lands. For these reasons, the Proposed Project would not have any impact on agricultural resources.

Forest Resources

Forested lands and timberland occupy a substantial portion of the County, with large areas of timber production in the Santa Cruz Mountains and North Coast. The Proposed Project is located within an area containing black cottonwood forest and woodland, California bay forest and woodland, California sycamore woodland, coast live oak

woodland and forest, Douglas fir forest and woodland, ponderosa pine forest and woodland, and redwood forest and woodland (see Section 4.4, Biological Resources, Table 4.4-1).

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 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 is not located on parcels zoned for timberland production (County of Santa Cruz 2023a).

The Proposed Project would not result in timber harvest or the removal of any trees that represent timber value. As described in Chapter 3, Project Description, the Proposed Project involves tree removal to accommodate new and upgraded facilities at the GHWTP. Some of these trees may be heritage trees under Chapter 9.56 of the City Municipal Code. However, these trees do not represent timber value, nor are they a forest resource. City regulations require replacement of approved heritage tree removals by replanting 3, 15-gallon or one 24-inch size specimen or the current value, or by contributing to the in-lieu fee program allowed by the ordinance called the Tree Trust Fund. Impacts associated with tree removal are addressed in Section 4.4, Biological Resources. Therefore, the Project would have no impact to forest resources.

4.1.2 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. Mineral resources in the County include four closed and four active quarries. Existing quarries in the project vicinity include the Quail Hollow and Hanson Quarries and the former Olympia Quarry, all of which are located north of the Proposed Project (County of Santa Cruz 2023b).

The California Geological Survey is responsible for classifying land into Mineral Resource Zones (MRZs) under the Surface Mining Control and Reclamation Act. The primary project site is located on lands with a mineral lands classification of MRZ-3a (areas containing known mineral deposits that may qualify as mineral resources); the Ocean Street Extension staging area is located on lands with a mineral lands classification of MRZ-3b (areas containing inferred mineral deposits that may qualify as mineral resources); and the Mt. Hermon Road staging area is located on lands with a mineral lands classification of MRZ-1 (areas where adequate geologic information indicates no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence) (California Department of Conservation 1999). Areas classified MRZ-3 are located in valleys that are generally underlain by Quaternary alluvial deposits containing sand and gravel; however, resource calculations in these areas cannot be definitively made due to inadequate subsurface data (California Department of Conservation 1987).

Although the primary project site is located on lands (MRZ-3a) that are classified as containing known mineral deposits that may qualify as mineral resources, no construction or operation activities are proposed that would have a

significant impact (resulting in the loss of availability of a known mineral resources or locally important mineral resource recovery site) on those potential mineral resources. The primary project site is currently used as a water treatment facility plant; the Proposed Project would replace the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities for its continued use as a water treatment facility plant. The Ocean Street Extension staging area would be used temporarily for staging during construction. Although the Ocean Street Extension staging area r is located on lands (MRZ-3b) that are classified as containing inferred mineral deposits, similar to the primary project site, no construction or operation activities are proposed that would have a significant impact on potential mineral deposits that may qualify as mineral resources. For these reasons, the Proposed Project would have no impact on known or locally important mineral resources.

4.1.3 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 would replace the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities. While the Mt. Hermon staging area is located on a parcel zoned Residential Agriculture, no residential land uses (e.g., housing) currently exist there. Further, the Proposed Project does not include any new uses that would displace existing housing or people, necessitating the construction of replacement housing. The Proposed Project would not generate new permanent or substantial temporary residential population or employment. Although the Proposed Project would generate a limited number of short-term construction jobs, these jobs would most likely be accommodated within the regional workforce and would not require substantial permanent relocation of workers. The Proposed Project does not include residential uses or improvements to off-site infrastructure such as a roadways or utilities that could indirectly induce population growth. The Proposed Project would not extend roads or require procurement of additional water supplies that could result in indirect population growth. As such, the Proposed Project would have no impact on population and housing. See Chapter 5, Other CEQA Considerations, for additional information about growth inducement.

4.1.4 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 Proposed Project would not include any new land uses that would generate new or increased demand for public services. As described above in Section 4.1.3, Population and Housing, no new residences or businesses are proposed and the Proposed Project would not lead to new permanent population or employment. Therefore, the Proposed Project would not result in an increase in population or employees and would have no impact on governmental facilities, including fire protection, police protection, schools, parks, and/or other public facilities.

Parks and Recreational Facilities

With regard to potential park and recreational facilities impacts, the CEQA Appendix G Guidelines focus on whether a project would include new or expanded facilities that may have a significant effect on the environment, or whether a project would increase the use of existing park and recreational facilities such that deterioration of the facilities

would be accelerated. The Proposed Project would not involve the construction of new or removal/reduction of existing parks or recreational facilities, and would not create a need for the expansion or addition of parks or recreational facilities. As previously discussed in Section 4.1.3, Population and Housing, the Proposed Project would not include any new residences, businesses, or additional permanent employment; nor would it displace existing housing or people, necessitating the construction of replacement housing. There would be no increase in population that could potentially generate increased demand for parks and recreational facilities in the project area. Therefore, the Proposed Project would have no impact on parks and recreational facilities.

4.1.5 References

California Department of Conservation. 1987. *Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area*. Special Report 146, Part IV.

California Department of Conservation. 1999. *Guidelines for Classification and Designation of Mineral Lands*.

California Department of Conservation. 2018. California Important Farmland Finder. Web Map Application. Accessed February 1, 2023. https://maps.conservation.ca.gov/DLRP/CIFF/.

County of Santa Cruz. 2023a. Planning Department GIS Web. Accessed February 7, 2023. https://gis.santacruzcounty.us/gisweb/

County of Santa Cruz. 2023b. "Santa Cruz County Quarries." Accessed February 7, 2023. http://www.sccoplanning.com/PlanningHome/Environmental/Quarries.aspx.

4.2 Aesthetics

This section describes the existing aesthetic conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The existing conditions assessment in this section is informed by observations/photographs from a site investigation/visit conducted by Dudek staff in January 2023 and follow-up site investigation in August 2023, and by as-built/construction drawings of the GHWTP provided by the City. The construction drawings are annotated and contain notes regarding lamp/lighting type (e.g., light-emitting diode [LED] or halogen) installed on the project site and whether any sources have subsequently been removed. The analysis is based on visualizations/renderings of the Proposed Project prepared by the design team, 60% design drawings of the Proposed Project, vendor information sheets for new lighting to be installed on at the GHWTP, existing conditions photographs illustrating the quality of existing views towards the GHWTP, and visual simulations of the Proposed Project prepared from off-site public vantage points in the surrounding area, as part of the preparation of this environmental impact report (EIR).

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. Comments related to aesthetics and more specifically, the elimination of non-essential artificial lighting and the use of light shrouds to improve nighttime lighting conditions, were received from the California Department of Fish and Wildlife and a neighboring resident. These comments, which are detailed in Table 2-1 and Section 4.4, Biological Resources, are related to the lighting and its potential effects on wildlife.

4.2.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3 in Chapter 3, Project Description. Given that the only above ground buildings and structures associated with the Proposed Project would be at the GHWTP parcel, this component of the primary project site is the focus of this description; however, the remainder of the primary project site and staging areas are also described.

Photographs of views to the GHWTP and surrounding areas from public vantage points were taken during a site investigation/visit conducted by Dudek staff in January 2023 with a follow-up visit in August 2023. Select photographs from the site visit are referenced below to illustrate existing character and/or view quality and the location of referenced photographs (and appropriate angle of view) is depicted in Figure 4.2-1, View Locations. In addition, the existing condition related to on-site lighting is informed by information (e.g., annotated site plan identifying location and number of on-site luminaires) provided by the City.

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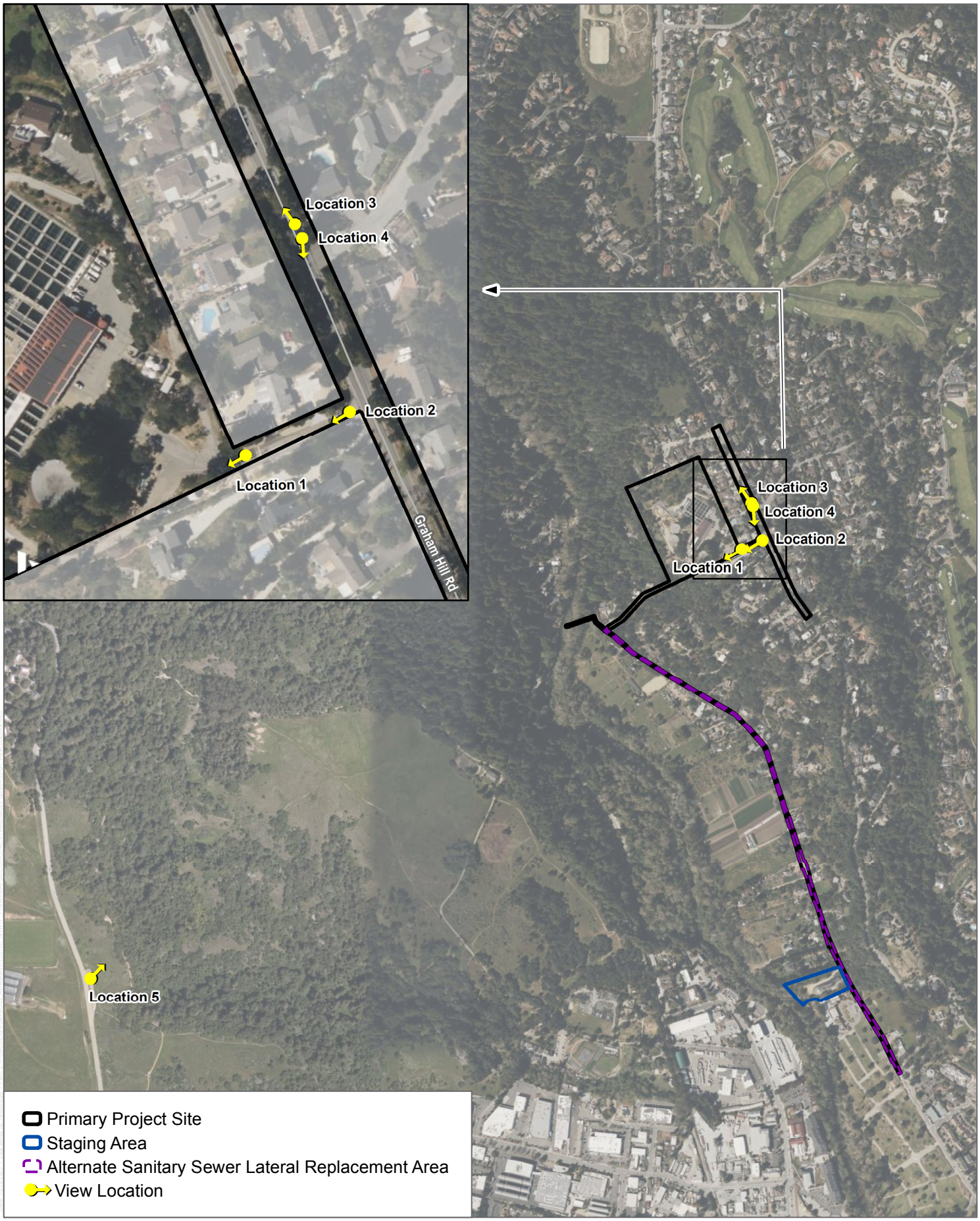

SOURCE: Bing Maps 2022

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0 500 1,000 Feet

FIGURE 4.2-1

View Locations

Graham Hill Water Treatment Plant Facility Improvements Project

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4.2.1.1 Visual Character

GHWTP Parcel

While the GHWTP parcel is generally blocked/screened from public view (i.e., public vantage points including parks, roads, trails, and other locations that offer broad public access) by intervening terrain, tall and mature trees, structures/residences, and a secured entrance gate (see Figure 4.2-2 [Location 1] that depicts the secured entrance gate, access driveway, area used for informal storage/laydown, and mature trees), the existing character of the site is described below to aid in the establishment of an aesthetics baseline and inform the assessment of view and visual character impacts.

The existing GHWTP parcel is illustrated on Figure 3-2 in Chapter 3, Project Description. As presented in the figure, existing components and developed features on the project site include the following:

- Water Quality Lab
- Water Treatment Basins
- Operations and Filter Building
- Filtration Basins
- Chemical Storage Areas
- Wash Water Supply Tank
- Concrete Tanks and Pad

The Water Quality Lab is located near the northeastern corner of the project site. The surrounding terrain gently slopes upwards to the east towards adjacent single-family residents (the property/fence line of the nearest residential property is approximately 20 feet away) while to the north, the local elevation rises over twenty feet from the Water Quality Lab to the nearest residential property/fence line (located approximately 145 feet away). Intervening terrain between the Water Quality Lab and residential properties are undeveloped but support clusters and lines of tall mature trees and lower shrubby plants. Trees and terrain effectively block the Water Quality Lab from view of residential properties to the north. The Water Quality Lab is housed in a single-story, ranch-style structure that aesthetically presents as similar to existing single-family residences in the surrounding area with one exception. The roof of the Water Quality Lab has been modified to accommodate three heating, ventilation, and air-conditioning systems (or similar systems) that are partially surrounded by a low enclosure on the west, east, and south. The Water Quality Lab also features a small, nine-spot, asphalt surface parking area to the southeast that is accessed via a narrow driveway extending south from the facility (paralleling the fence line of multiple [6] residential properties) to the main driveway to the project site off Graham Hill Road. To the west of road (and west of a single line of dense trees) lie multi-use trailers, water treatment basins, the Operations and Filter Building, and chemical storage areas. See Figure 3-2.

Located to the west of the Water Quality Lab and associated surface parking lot, the multi-use trailers and adjacent water treatment basins are situated on a paved pad that adjoins a narrow access road and abuts the nearby Operations and Filter Building to the south. The prefabricated trailers (approximately 8 feet high by 60 feet long) feature flat roofs, two entrances/doors each and several windows along the north-facing façade. The paved area immediately surrounding the trailers to the north and east are utilized by site staff for parking (the area to the west is occupied by two lamella clarifiers). A fenced area (approximately 190 feet long by 160 feet wide) encompasses a series of square, open basins and associated piping/infrastructure. Individual basins are separated from one another by a grid-like layout of narrow walkways that provide for staff access and observation.

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Location 1: View West from the GHWTP Driveway towards the gated entrance of the GHTWP and Wash Water Supply Tank (Obscured by Trees)

Location 2: View West from GHWTP Driveway towards GHWTP Entrance Gate

Source: Google Earth 2023

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FIGURE 4.2-2

Views: Existing Conditions

Graham Hill Water Treatment Plant Facility Improvements Project

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In addition to surface parking and a small, pre-fabricated storage trailer, the Operations and Filter Building is located to the south of the water treatment basins area. The rectangular, single-story structure (150 feet long by 80 feet wide; approximately 9,000 square feet) is topped by a brick red, pitched, metal siding roof that is nearly covered by flat, low-profile solar panels. The pitched roof of the Operations and Filter Building includes flat portions near the north and south extents that cover a narrow walk and landscaped area. Building facades incorporate regular sections of tan/light brown colored material that are separated by vertical posts that have been painted white. The southern portion of the Operations and Filter Building has a series (12) of rectangular basins separated into two rows/areas by a long and rectangular, tan-colored building. A small storage area featuring a metal siding building (i.e., the site's Electrical/Motor Control Center [MCC] Room) and other indeterminant structures abuts the Operations and Filter Building on the south.

The chemical storage areas are located to the east of the Operations and Filter Building. The chemical storage areas are surrounded by mature trees on three sides. The chemical storage areas include a cubic concrete structure, four cylindrical, aboveground tanks (approximate diameter of 10 feet each), a small and rectangular steel storage shed (approximately 25 feet long), and informal, surface parking spots.

Lastly, the project site's cylindrical wash water supply tank and the cylindrical concrete tanks are located near the southern and western extents, respectively, of the GHWTP. The wash water supply tank (approximate diameter of 75 feet and height of 10 feet) is surrounded by mature trees on three sides (existing trees inhibit clear views to the tanks). As viewed from Locations 1 and 2 (see Figure 4.2-2), the wash water supply tank is obscured by mature trees planted on the moderate slope surrounding the tank. The three concrete tanks (currently under construction as part of the GHWTP Concrete Tanks Project; approximate diameter of 75 feet and height of 20 feet each) are located downslope from the water treatment and filtration basins and are bordered on the west by a paved driveway used for access and storage.

The GHWTP is a secured and fully fenced facility that is closed to the public. The GHWTP has an entrance access road off Graham Hill Road, with a security gate and internal access roads (shown in Figure 4.2-2 [Location 1]). As previously stated, the GHWTP site features varying topography (elevations generally increase from west to east and south to north) and structures/facilities are generally buffered from nearby residences by intervening terrain and/or tall and mature trees.

Area Surrounding the GHWTP Parcel

The approximately 12.4-acre GHWTP parcel is surrounded by single-family residential land uses on the northern, eastern, and southern perimeters. On the north, single-family homes front Mosswood Court and back to an undeveloped area of the GHWTP that supports grasses and scattered mature trees. Existing residences and landscaping (primarily trees) block the GHWTP from view of Mosswood Court viewers. Homes to the east of the GHWTP parcel front Graham Hill Road and back up to the GHWTP and more specifically, to a narrow access road from the main facility driveway off Graham Hill Road to the Water Quality Lab. Similar to homes abutting the GHWTP parcel on the north, existing homes to the east are older, single-story ranch style structures that are constructed on 200-foot (or greater) long lots featuring mature trees including oak and other species. Figure 4.2-3 (Locations 3 and 4) illustrates the existing character of residential development and landscaping along Graham Hill Drive near the GHWTP (see Graham Hill Road Right-of-Way below for additional information). To the south of the GHWTP parcel boundary, single-family residential properties are adjacent to the primary driveway to the facility and an internal access road that encircles the facility's above-ground wash water supply tank. As previously discussed above, the wash water supply tank is surrounded by mature trees.

West of the water treatment basins, Operations and Filter Building, and associated filtration basins, the facility property slopes downwards towards the San Lorenzo River. The sloping terrain west of the GHWTP parcel features scattered single-family residences that are surrounded by a dense forest of mature trees (this landscape pattern generally continues to the banks of the San Lorenzo River; located 200 feet lower in elevation than the westernmost boundary of the main GHWTP facility). Beyond the San Lorenzo River and Highway 9 lies the City's Pogonip Open Space, a 640-acre area comprised of open meadows, woodlands, and creeks and featuring an 11.5-mile long trail system (City of Santa Cruz 2023).

Utility Corridor

The utility corridor spans between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension. This area contains the existing underground 18- to 24-inch storm drain line, dedicated to the GHWTP, that discharges directly to the San Lorenzo River. The City has an easement over the utility corridor that passes through private property encompassing forested, descending terrain. There are no above ground components of the storm drain line.

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way spans between just north of Mosswood Court and just south of Lyle Way. The two-lane north-south road features shoulders and no on-street parking. This area contains a segment of the County's existing gravity sewer in Graham Hill Road and other exiting utilities. Residential development, trees, and other vegetation line the Graham Hill Road right-of-way on either side, as shown in Figure 4.2-3 (Locations 3 and 4).

Alternate Sanitary Sewer Lateral Replacement Area

The alternate sanitary sewer lateral replacement area spans from the southwest corner of the GHWTP parcel at Ocean Street Extension and along Ocean Street Extension to the City Public Works Department maintained sanitary sewer connection at Graham Hill Road. Ocean Street Extension is a paved but largely unimproved road. This area contains an underground segment of the City's existing sewer lateral located in Ocean Street Extension. Rural residential development, trees, and other vegetation line this alignment on either side. Some agricultural lands occur along the alignment.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area for the Proposed Project is located on Ocean Street Extension. This area is currently being used for temporary staging and laydown of equipment and/or storage. The area is immediately north of the Santa Cruz Memorial Cemetery and is surrounded by trees on two sides. The eastern edge of the gated area is accessed and visible from Ocean Street Extension.

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is located at the northwestern corner of Graham Hill Road and Mt. Hermon Road. This area has been previously used for temporary staging and laydown of equipment and/or storage during the CZU Lightening Complex Fire recovery. The cleared site is covered in dirt or gravel and continues to be used for staging and laydown. Because the site is surrounded by woodland and other vegetation, views to the site from the adjacent Mt. Hermon Road are generally blocked; however, there are several gaps in the surrounding vegetation, such as at the access gate, through which views of the site are available from Mt. Hermon Road.

Location 3: View North from Graham Hill Road towards Existing Residential Development Near the GHWTP

Location 4: View South from Graham Hill Road towards Existing Residential Development Near the GHWTP

Source: Google Earth 2023

FIGURE 4.2-3

Views: Existing Conditions

Graham Hill Water Treatment Plant Facility Improvements Project

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4.2.1.2 Scenic Vistas

According to the City's General Plan 2030 EIR, prominent scenic views in the City are those "those that are oriented toward Monterrey Bay and the Pacific Ocean or toward the Santa Cruz Mountains" (City of Santa Cruz 2011). Further, the General Plan 2030 EIR expands upon this general description and on Figure 4.3-1, Significant Views/Features, maps locations in the City and on the campus of University of California (UC) Santa Cruz that offer panoramic and urban views.[1] None of the panoramic views depicted on General Plan 2030 Figure 4.3-1 (including views from Pogonip Open Space) are oriented towards the direction of GHWTP and the nearest northerly-oriented urban view (at the Highway 1 crossing of the San Lorenzo River; approximately 1 mile south of the GHWTP) does not extend to the GHWTP or GHWTP facilities due to intervening tall trees and higher terrain. The UC Santa Cruz campus is identified as a Visual Landmark on General Plan 2030 EIR Figure 4.3-1. "Landmarks:" are defined in the General Plan 2030 EIR as "distinctive built and natural features that are highly visible or that help to define the identity of a particular place" (City of Santa Cruz 2011).

While not a City-designated scenic vista or panoramic view, the Lookout Trail Trailhead parking lot off Coolidge Drive at the eastern boundary of the UC Santa Cruz campus offers scenic views of the surrounding area. Views from the trailhead parking lot, located within the Pogonip Open Space area, extend to the distant Santa Cruz Mountains to the east and the Pacific Ocean to the southwest and south. Due to the length and clarity of the views from the elevated vantage point, the Lookout Trail Trailhead parking lot is considered a scenic vista for purposes of this analysis (the parking lot is located approximately 1.1 miles to the southwest of the GHWTP). From this vista point, GHWTP facilities (primarily the concrete tanks in the western extent of the site) are visible and low on the hillside just above the tree line to the east of the Pogonip Open Space area (i.e., the large clearing of softly rolling hills in the foreground of the view; see Figure 4.2-4 (Location 5) for representative northeast-oriented view from the trailhead.

4.2.1.3 Scenic Highways and Roadways

Three eligible state scenic highways are located near the GHWTP and more generally, the Santa Cruz area (Caltrans 2023). Highway 17, an eligible state scenic route from Highway 1 north to Highway 9 in Los Gatos, is located approximately 0.65 mile to the east of the GHWTP. Highway 9, an eligible state scenic route from Highway 1 north to Highway 236 near Boulder Creek, is located approximately 0.20 mile to the west of the GHWTP. Lastly, Highway 1 is an eligible state scenic highway from Route 101 near San Luis Obispo to Route 35 near Daly City. Near the GHWTP, Highway 9 generally parallels the alignment of the San Lorenzo River. Due to intervening terrain and vegetation (i.e., tall, and mature trees), in general, neither Highway 17 nor Highway 9 provide views to the GHWTP. The only exception is that near the intersection of Highway 9 and Highway 1, a distant view of a portion of the GHWTP is visible to the north on the ridgeline along with other scattered residences. The nearest officially designated state scenic route is Highway 1 in San Mateo County. According to the City's General Plan 2030 EIR, "there are no designated scenic highways or roads within the City" (City of Santa Cruz 2011).

The County's General Plan identifies Graham Hill Road (from Lockwood Lane to Highway 9) and Mt. Hermon Road (from Scotts Valley City limits to Graham Hill Road) as scenic roads (County of Santa Cruz 2022). Intermittent views to the Mt. Hermon Road staging area between gaps in existing vegetation are available from both the scenic road segments of Mt. Hermon Road and Graham Hill Road (the staging area is located at the northwest corner of the intersection of these two roads).

[1] "Urban Views" encompass views (typically along streets) of the City's existing developed area.

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Location 5: View Northwest from Pogonip Open Space Lookout Trail Trailhead towards Pogonip, GHWTP, and distant Santa Cruz Mountains

Source: Google Earth 2023

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FIGURE 4.2-4

Views: Existing Conditions

Graham Hill Water Treatment Plant Facility Improvements Project

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4.2.1.4 Light and Glare

The following information is based on an annotated site plan provided by the City that identified location, number, technology (i.e., LED, halogen, or sodium), and mount type (e.g., wall or pole mounted) of existing on-site lighting.

Within the project site boundaries, outdoor lighting fixtures are installed at the main entry, and along the west, north and south façades of the Operations and Filter Building, around the Operations and Filter Building parking lot, on the facades of the Electrical/MCC Room, at the chemical storage areas, and at the water treatment basins area. Specifically, outdoor lighting at the GHWTP includes wall-mounted LEDs on the facades of the Operations and Filter Building and Electrical/MCC Room (a pole mounted halogen luminaire controlled by a photocell is also installed near the north façade of the Operations and Filter Building). Additional pole-mounted LED luminaries are installed around the Operations and Filter Building parking area (five total lamps are installed), at the chemical storage areas (lamps include two LEDs and one halogen luminary directed toward tanks), and on the flocculator deck of the water quality basin area. The pole-mounted luminaires (approximately eight in total) are distributed throughout the basin deck area and are manually controlled by switches.

Sources of light and glare in the area surrounding the GHWTP are generally limited. For example, no streetlights are installed along Graham Hill Road, Mosswood Court, Highway 9, or any of the small, neighborhood roads located to the east or west of the GHWTP parcel. The primary source of stationary outdoor light and glare in the surrounding area are wall mounted lights located near entryways to private residences.

4.2.2 Regulatory Framework

4.2.2.1 Federal

There are no federal aesthetics-related regulations, plans, or policies that are particularly applicable to the Proposed Project and/or project site.

4.2.2.2 State

Caltrans State Scenic Highway System

In 1963, the State Legislature established the California Scenic Highway Program through Senate Bill 1467 (Farr). The California Department of Transportation (Caltrans) manages the State Scenic Highway Program. Caltrans provides guidance to local government agencies, community organizations and citizens that are pursuing the official designation of a State Scenic Highway. Further, the State assigns responsibility for the regulation of land use and development along scenic highways to the appropriate State and local governmental agencies.

The California State Scenic Highway Program consists of Officially Designated State Scenic Highways and Eligible State Scenic Highways. While Officially Designated State Scenic Highways are identified as such in the State Streets and Highways Code, Eligible State Scenic Highways are typically locally or regionally designated scenic routes that agencies have yet to adopt corridor protection plans for and/or have not formally pursued official designation.

Title 24 Outdoor Lighting Zones

California Building Code (CBC) (California Code of Regulations Title 24), including Title 24, Part 6, includes Section 132 of the Building Energy Efficiency Standards, which regulates lighting characteristics, such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off. Different lighting standards are set by classifying areas by lighting zone. Outdoor lighting zones include LZ0 (very low ambient illumination; typically undeveloped areas), LZ1 (low ambient lighting; typically rural areas), LZ2 (moderate ambient lighting; typically urban clusters), LZ3 (moderately high ambient lighting, typically urban areas), and LZ4 (high ambient lighting). Based on the default location descriptions provided in Table 10-114-A, Lighting Zones Characteristics and Rules for Amendments by Local Jurisdictions, of the CBC, the project site is within the LZ1 zone. Exterior lighting allowances are stricter in very low and low ambient lighting zones compared to allowances in moderate to high ambient lighting areas.

4.2.2.3 Local

City of Santa Cruz General Plan 2030

The following policies of the City's General Plan 2030 (Community Design Chapter) are relevant to the Proposed Project:

Goal CD1. A built environment in harmony with its natural setting.

Policy CD1.2. Ensure that the scale, bulk, and setbacks of new development preserve important public scenic views and vistas.

Policy 1.2.1. Develop complimentary siting, scale, landscaping, and other design guidelines to protect important public views and ensure that development is compatible with the character of the area.

Policy CD1.3. Ensure that development is designed to be in harmony with natural topography and vegetation.

County of Santa Cruz 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). A partial update to the County's General Plan, known as the Sustainability Policy and Regulatory Update or Sustainability Update (County of Santa Cruz 2022), was approved by the County Board of Supervisors in December 2022 and is pending final certification by the California Coastal Commission. In the Sustainability Update, the existing Conservation and Open Space Element is proposed to be renamed as the Agriculture, Natural Resources + Conservation (ARC) Element and has been reorganized. The proposed amendments generally retain existing policies related to visual resources protection with only minor edits. The following policies of the County's General Plan are relevant to the Proposed Project:

Policy ARC-5.1.1. Designation of Visual Resources. Designate on the General Plan/LCP Resources and Constraints Maps (Appendix F) and define visual resources as areas having regional public importance for their natural beauty or rural agricultural character. Include the following areas when mapping visual resources: vistas from designated scenic roads, Coastal Special Scenic Areas, and unique hydrologic, geologic, and paleontologic features identified in Goal 6. Ocean views, agricultural fields, wooded

forests, open meadows, ridgetops, and mountain hillside views are also public scenic assets that should be identified and considered during development review permit processes.

Policy ARC-5.1.2. Development Within Visual Resource Areas. Recognize that designated visual resources of Santa Cruz County possess diverse characteristics that are worthy of protection. Require projects in visual resource areas to be evaluated against the context of their unique environments and regulate structure height, setbacks, materials, and design to protect these resources consistent with the objectives and policies of this section.

Policy ARC-5.1.3. Protection of Public Vistas and Scenic Assets. Protect significant public vistas and public scenic assets as identified in Policy ARC-5.1.1, even those that are not mapped and designated as visual resource areas, scenic roads, coastal special scenic areas, or other unique features, by minimizing disruption of landform and aesthetic character caused by grading operations, timber harvests, utility wires and poles, signs, inappropriate landscaping and structure design. Provide necessary landscaping to screen development that is unavoidably sited within these vistas. Proposed landscaping within public vistas should be sited and designed to retain existing public views of vistas and scenic assets over the life of the development whenever feasible, and especially for coastal designated visual resources.

Policy ARC-5.1.5. Preserving Agricultural Vistas. Preserve the aesthetic value of agricultural vistas. Encourage development to be consistent with the agricultural character of the community. Structures appurtenant to agricultural uses on agriculturally designated parcels are considered compatible with the agricultural character of surrounding areas.

Policy ARC-5.2.1. Designation of Scenic Roads. The following roads and highways are valued for their vistas. [The list includes Highway 9 – from Route 1 to Santa Clara County; Highway 17 – from Highway 1 to Santa Clara County; Graham Hill Road – from Lockwood Lane to Highway 9; and Mt. Hermon Road – from Scotts Valley City limits to Graham Hill Road.] The public vistas from these roads shall be afforded the highest level of protection.

Policy ARC-5.2.2. Development Visible from Rural Scenic Roads. In the viewsheds of rural scenic roads, require new discretionary development, including development envelopes in proposed land divisions, to be sited out of public view, designed for compatibility with area character, and/or obscured by natural landforms and/or existing vegetation. Where proposed structures on existing lots are unavoidably visible from scenic roads, identify those visual qualities worthy of protection and require the siting, architectural design and landscaping to mitigate the impacts on those higher value visual qualities.

4.2.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of the Proposed Project related to aesthetics. 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 is also identified.

4.2.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to aesthetics 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. Eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor, including views of the ocean, to and along the shoreline, and panoramic background mountain views.
B. Eliminate or substantially adversely affect significant scenic resources along a scenic highway or designated scenic roadway, including, but not limited to, visually prominent trees, rock outcrops, or historic buildings, or visually prominent trees or historic-landmark buildings in other locations within the City.
C. Substantially degrade the existing visual character or quality of the surrounding area--i.e., be incompatible with the scale or visual character of the surrounding area, or substantially detract from the integrity, character, and/or aesthetic character of the neighborhood.
D. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views or activities in the area, or pose a nuisance. This includes ambient nighttime illumination levels that would be increased beyond the property line, or use of highly reflective building materials.

4.2.3.2 Analytical Methods

Potential impacts related to aesthetics were identified based on the results of the site investigation conducted by Dudek staff in January 2023 with a follow-up site investigation in August 2023, review of existing lighting information, and physical changes associated with construction and operation of the Proposed Project. This analysis assumes that the Proposed Project would be designed and constructed in compliance with all relevant City codes. Impacts have been evaluated with respect to the thresholds of significance, as described above. In the event adverse environmental impacts would occur, impacts would be potentially significant, and mitigation measures would be provided to reduce impacts to less than significant.

The City has adopted standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. However, there are no City standard construction practices applicable to aesthetics that are part of the Proposed Project.

4.2.3.3 Project Impact Analysis

Areas of No Impact

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

- **Scenic Highways and Roadways (Significance Threshold B).** While there are three eligible state scenic highways near the GHWTP, neither Highway 17 nor Highway 9 currently provide views to the GHWTP and due to existing intervening features (terrain and vegetation), views to the GHWTP would generally not be available from these highways. However, from the Highway 9 and Highway 1 intersection, a distant view of a portion of the GHWTP is visible to the north on the ridgeline along with other scattered residences. While visible, elements of the GHWTP are not particularly distinct or clear as experienced from the intersection

and distant development on the GHWTP would not eliminate or adversely affect significant scenic resources within the available viewshed. The GHWTP is not within the viewshed of an officially designated state scenic highway and according to the City's General Plan 2030 EIR, there are no designated scenic highways or roads within the City.

The GHWTP is also not within the viewsheds of two County scenic roads: Graham Hill Road from Lockwood Lane to Highway 9 and Mt. Hermon Road from Scotts Valley City limits to Graham Hill Road. All other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities that would potentially affect the viewsheds from the above listed highways and roadways. The Ocean Street Extension staging area is not within the viewshed of the aforementioned scenic highways and roads and while views to the area are available from adjacent Ocean Street Extension (an unstriped, narrow and primarily residential access road), the site has been previously disturbed/partially cleared. While the Mt. Hermon Road staging area is adjacent to the two County scenic roads above, use of this site for staging by the Proposed Project would not eliminate or adversely affect significant scenic resources along these roads, as the site has been previously disturbed/partially cleared, is currently being used for a similar staging/laydown use, and is partially blocked from view by users of Graham Hill Road and Mt. Hermon Road by intervening topography and vegetation. Therefore, the Proposed Project would not eliminate or substantially adversely affect significant scenic resources along a scenic highway or designated scenic roadway and there would be no impact.

Project Impacts

Impact AES-1	Scenic Vistas (Significance Threshold A). The Proposed Project's construction and operational activities would not eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor. ***(Less than Significant).***

According to the City's General Plan 2030 EIR, prominent scenic views in the City are "those that are oriented toward Monterrey Bay and the Pacific Ocean or toward the Santa Cruz Mountains" (City of Santa Cruz 2011). Prominent scenic views in the City and on the UC Santa Cruz campus are mapped on General Plan 2030 EIR Figure 4.3-1, Significant Views/Features. As stated in Section 4.2.1.2, none of the mapped panoramic views depicted on General Plan 2030 EIR Figure 4.3-1 (including views from Pogonip Open Space) are oriented towards the GHWTP and from Highway 1 at the San Lorenzo River crossing (i.e., the nearest mapped urban view), GHWTP facilities are blocked by intervening, tall trees along the river corridor and on distant hillsides to the north. In addition, the typical duration of the available north-oriented view along the San Lorenzo River from Highway 1 is short, lasting only seconds. As previously mentioned, distant, partial views to a portion of the GHWTP are available from the Highway 9 intersection with Highway 1. Due to distance, development on the GHWTP site would not adversely affect, modify, or obstruct a visually prominent or significant public scenic vista and site development would not be distinct when experienced from the brief, mobile view available from Highway 1 at the intersection with Highway 9. As such, construction and operation activities associated with the Proposed Project would not eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor identified and mapped as a prominent scenic view in the City's General Plan.

While not a City-mapped panoramic or urban view, the Lookout Trail Trailhead parking lot off Coolidge Drive in the Pogonip Open Space area (i.e., within the northern portion of the City) offers a scenic views of the surrounding area. Specifically, views from the trailhead parking lot extend to the distant Santa Cruz Mountains to the east and the

Pacific Ocean to the southwest and south. Due to the length and clarity of views from the elevated vantage point, the Lookout Trail Trailhead parking lot is considered a scenic vista for purposes of this analysis (the trailhead parking lot is located approximately 1.1 miles to the southwest of the GHWTP). A representative east-oriented view of the surrounding landscape as experienced from the trailhead parking lot is presented on Figure 4.2-4 (Location 5). As shown in the existing conditions photograph, the trailhead view looks across the gently rolling hills and forested lands of the Pogonip towards visibly developed hillsides with dense forested terrain. Also, the distant background is defined by the dark, prominent terrain of the Santa Cruz Mountains. While the existing GHWTP and Proposed Project would be partially visible from the trailhead lookout, proposed construction and development would occur at an existing water treatment plant facility and would not entail the substantial alteration of forested lands or other modifications that would noticeably affect or modify the quality of the existing view. A visual simulation of the Proposed Project as experienced from the trailhead lookout is presented on Figure 4.2-5, and as depicted in the simulation, the resulting visual change associated with Proposed Project development would be detectable but would not be visually prominent in the visible landscape. Further, construction activities and equipment (including cranes, forklifts, dozers, excavators, and loaders) would not result in substantial or particularly noticeable view blockage as experienced from the Lookout Trail Trailhead (located over 1 mile away). Also, the new and upgraded water treatment processes, new and upgraded buildings, and infrastructure and site improvements at the GHWTP site would not create any view obstructions such as blockage of the distant Santa Cruz Mountains. As previously mentioned, the GHWTP is located approximately 1.1 miles away from and approximately 200 feet lower in elevation than the trailhead lookout and as such, construction equipment and activities including the removal of existing trees to accommodate new and upgraded GHWTP facilities would not eliminate or substantially adversely affect, modify, or obstruct the eastward view available from the Lookout Trail Trailhead parking lot. Further, the operation of new and upgraded buildings (heights ranging from 25 to 45 feet) and tanks (heights ranging from 10 to 25 feet) would not eliminate or substantially adversely affect, modify, or obstruct the eastward view available from the Lookout Trail Trailhead parking lot.

In addition to construction activities that would not be visible from a visually prominent or significant public scenic vista, public viewing area, or public view corridor, the operation of other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities. Therefore, these Proposed Project components would not potentially affect available views from mapped panoramic or urban views identified on General Plan 2030 EIR Figure 4.3-1. In addition, the Ocean Street Extension staging area is not visible from a mapped urban view or a significant public viewing area or view corridor and staging of equipment and materials at this location would not be clearly visible from the Pogonip Open Space area which offers panoramic views. For example, as experienced from the Lookout Trail Trailhead parking lot (located 1 mile to the northwest), activities at the Ocean Street Extension staging area would be obscured by the broad nature of the available view, presence of dense forested lands in the visible landscape, and distance. As previously discussed, both Graham Hill Road and Mt. Hermon Road are County-designated scenic roads and are adjacent to the proposed Mt. Hermon Road staging area. However, use of the site for construction staging would not adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor because the site has been previously disturbed/partially cleared and the temporary storage of materials, equipment, and vehicles would be partially blocked from view of road users by intervening topography and vegetation (including mature trees).

Overall, construction and operational impacts to scenic vistas, public viewing areas, or a public view corridor would be less than significant.

Existing View

Visual Simulation of the Proposed Project

FIGURE 4.2-5

Visual Simulation of Proposed Project from Pogonip Open Space Lookout Trail

Graham Hill Water Treatment Plant Facility Impovements Project

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Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to scenic vistas, public viewing areas, or a public view corridor, and therefore, no mitigation measures are required.

Impact AES-2	Visual Character (Significance Threshold C). The Proposed Project would not substantially degrade the existing visual character or quality of the surrounding area (i.e., be incompatible with the scale or visual character of the surrounding area, or substantially detract from the integrity, character, and/or aesthetic character of the neighborhood. ***(Less than Significant)***

A portion of the primary project site encompasses the existing GHWTP that is situated on a hillside located within City limits. Further, the GHWTP exists as an island annexation of City land zoned for Public Facility surrounded by County jurisdictional lands on all sides that are developed with single-family residential uses. While views to the GHWTP site are available from the GHWTP driveway off Graham Hill Road near the gated entrance (see Figure 4.2-6), the site and facilities have limited visibility from surrounding public viewing areas including public roads. GHWTP facilities are not visible from nearby Graham Hill Road and Mosswood Court, as facilities are blocked from view by intervening single-family residences, topography, and/or vegetation/trees. Distant and generally brief views to a portion of the GHWTP site are available from the Highway 9 intersection with Highway 1 along with other scattered residential development along the ridgeline. Thus, there would be limited visibility of construction activities from public vantage points in the immediate surrounding area. Where visible, increased activity at the GHWTP parcel and activities including tree removal activities, demolition, and building/facility construction would be experienced as temporary, short-term visual change that would cease following completion of construction.

Once constructed and where visible, the presence of new or upgraded buildings and tanks would result in on-site visual change that would be mostly compatible with the existing character of the GHWTP (a public service facility). the wash water tanks and chemical storage facilities would be in the same/similar location as the existing wash water tank and chemical storage area. While proposed tree removal would increase overall visibility from the GHWTP entrance gate (see Figure 4.2-6), the new 500,000-gallon wash water storage tank (approximately 75 feet in diameter and up to 25 feet in height) would present a similar apparent scale as the existing wash water tank. While a new 150,000-gallon maintenance tank is proposed (this feature is proposed to the east of the new wash water tank), the presence of this additional tank near the larger replacement tank would be visually compatible with the existing character of the treatment plant. The new Chemical Storage and Feed Building (approximately 25 feet in height) would be in a similar location as the existing chemical storage areas. While existing tanks in the storage area are not housed in a building, tanks are an established structure on the GHWTP parcel and the presence of a simple structure housing the chemicals would not result in substantial degradation of existing visual character of the site.

The Solids Dewatering Building (a 45-foot-high, two-story concrete and concrete masonry unit structure to be located to the west of the Chemical Storage and Feed Building) would have limited visibility from public vantage points including Graham Hill Road due to the characteristics of local terrain and presence of nearby mature trees on private property that would help to block views of the structure. Also, the upgraded Operations and Filter Building (approximately 25 feet high and consisting of a metal paneled structure) is sited in the same area as the existing Operations and Filter Building and would have limited public visibility.

While proposed tree removal would have lasting effects and maturation of replacement vegetation/trees would take years to replicate height and spread removed trees, the visual effects of tree removal and reestablishment of vegetation would generally have limited visibility from public vantage points in the surrounding area (thus reducing the overall severity of change). Due to proximity and location at the GHWTP access entrance gate, the visual simulation from the entrance (Figure 4.2-6) illustrates the worst-case scenario regarding visibility of tree removal (and related enhanced visibility of the wash water storage tank) from a public vantage point. Also, and as viewed from the GHWTP entrance gate, implementation of the Proposed Project would result in a generally more orderly appearance/site. As shown on Figure 4.2-5, removal of existing trees from the site to accommodate new and/or reconstructed facilities would also be visible from the elevated vantage point offered at the Lookout Trail Trailhead parking lot; however, effects to overall site integrity and character would be limited as the site is an existing and operating water treatment plant with various structures, tanks, and facilities. From the Lookout Trail Trailhead parking lot, Proposed Project implementation including proposed tree removal would result in increased color contrasts compared to the existing site due to reduce screening of GHWTP facilities associated with removal of vegetation from the GHWTP parcel. Views to Proposed Project components would be available from this elevated vantage point; however, since components would be located on the site of an existing water treatment plant and despite the taller (compared to existing on-site structures) vertical scale of the new Solids Dewatering Building (45 feet high), new and upgraded components would not be incompatible with the visual character of the existing treatment plant that consists of a series of buildings, tanks, and process facilities.

Regarding scale discrepancies between new buildings/structures and off-site land uses (and structures) to the east, the apparent scale of the Solids Dewatering Building would be slightly reduced by the drop in elevation across the GHWTP parcel from east to west. Regarding proposed tree removal, the loss of mature heritage trees would result in noticeable change to site landscape coverage and character. However, the loss of heritage trees would be addressed through compliance with Chapter 9.56 of the City Municipal Code (Heritage Tree Ordinance) that requires replanting of tree species or payment of in-lieu fees. While on-site tree canopy would be visibly less than existing during the establishment period, the increased visibility of building and tanks from the elevated vantage point offered at the Lookout Trail Trailhead parking lot would not substantially degrade the existing visual character of the treatment plant.

As previously stated, portions of the GHWTP are visible from the Lookout Trail Trailhead parking lot off Coolidge Drive in the northern area (i.e., Pogonip Open Space) of the City. Specifically, concrete tanks in the western portion of the GHWTP are relatively clear in the available view (see Figure 4.2-4 [Location 5]) but all other components including the Operations and Filter Building, wash water supply tank, water treatment basins, and Water Quality Lab are either not visible or are indistinguishable due to distance and partial screening from intervening vegetation. While Proposed Project construction would temporarily impact the view due to increased on-site activity including additional vehicles and equipment, tree removal, and demolition and construction of structures, the character of the post-construction GHWTP would remain similar to existing conditions. The concrete tanks that are currently under construction in the western portion of the GHWTP would remain the primary visual element of the facility in views from the Lookout Trail Trailhead parking lot and new and updated buildings ranging in height from 25 feet (e.g., the new Ozone Building, upgraded Operations and Filter Building, Chemical Storage and Feed Building, and Maintenance Building) to 45 feet (e.g., the new Solids Dewatering Building) would not be visually distinct and would not result in adverse or particularly prominent impacts to the existing visual character of the site or surrounding area (see Figure 4.2-5). Due to distance, partial or complete screening by intervening GHWTP structures or existing vegetation, and/or the vertical profile of non-building components (such as new and upgraded treatment processes and new 25-foot and 20-foot wash water storage tanks), infrastructure and site improvements, and stormwater management improvements, would not have an adverse effect on visual character and would not result in substantial degradation of views of the site or surrounding area.

Existing View

Visual Simulation of Proposed Project Showing 10 years of Vegetation Growth and Upgraded Operations and Filter Building

FIGURE 4.2-6

Visual Simulation of Proposed Project from Access Driveway

Graham Hill Water Treatment Plant Facility Impovements Project

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Lastly, the construction and operation of other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities. Construction activities associated with these components would temporarily alter existing character through ground disturbing activities, presence of equipment, vehicles, and personnel; however, this change would be short-term and would not result in substantial degradation of the existing landscape setting. Similarly, use of the Ocean Street Extension staging area could result in visible change to existing on-site conditions; however, due to the previously disturbed nature of the site, ongoing use of the site for construction staging, limited public visibility of the site, and lack of significant visual resources on site, temporary use for staging activities would not substantially degrade existing visual character, result in substantial incompatibility with the visual character of the surrounding area, or substantially detract from the integrity of the neighborhood. Temporary use of the Mt. Hermon Road staging area during construction would not degrade existing character or detract from the existing site integrity because the site has been previously disturbed/partially cleared and is currently used for similar construction staging purposes. Therefore, construction and operation of Proposed Project components within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way, and staging of construction at the Ocean Street Extension and Mt. Hermon Road staging areas would not result in the substantial degradation of existing visual character or quality.

Overall, construction and operation of the Proposed Project would not result in the substantial degradation of existing visual character or quality and impacts would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to visual character, and therefore, no mitigation measures are required.

Impact AES-3	Light or Glare (Significance Threshold D). The Proposed Project components, including new sources of lighting, new structures, and new materials, would not adversely affect daytime or nighttime views or activities in the area or pose a nuisance ***(Less than Significant)***

Lighting

Existing sources of light and glare on the GHWTP were previously discussed in Section 4.2.1.4. As stated therein, pole-mounted and building exterior mounted lights are the primary sources of light and potential glare at the GHWTP site. As proposed and similar to existing conditions, new exterior safety lighting may be installed on the new tanks and along pathways between structures, and along access roads for security and safety purposes. All new exterior site lighting would be LED type, and designed and selected to meet exterior lighting allowances established in the CBC for the applicable LZ1 zone. Lastly, roadway luminaires would have external glare shields or house side shields to minimize light trespass.

Construction would be phased and typically occur during normal weekday work hours, between 8:00 AM and 6:00 PM, with potential work outside of those hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36(e). As further discussed in Section 3, Project Description, up to 25 planned plant shutdowns are anticipated over the course of the four-year construction period to allow for required construction activities to occur (approximately half of the shutdowns would range between 8 and 24 hours in length and would have no restriction on scheduled hours of work). Since most construction would occur during daylight hours and would not require or need mobile lighting sources to illuminate work areas, construction is not anticipated to create substantial light or glare that would affect nighttime views in

the area (or pose a nuisance). While work would occur outside of the hours of 8:00 AM to 6:00 PM, such occurrences would be limited, and lighting sources would be limited in number, hooded, and generally directed downward to minimize illumination of the sky and trespass to off-site/off-GHWTP areas.

As mentioned above, site lighting may include roadway lights, wall mounted lights at the exterior of buildings; and maintenance lights located at outdoor open process areas. For roadway lighting, all luminaires would be pole mounted (14- to 16-foot-high poles) and photocell controlled to automatically operate during nighttime hours. Roadway luminaires would be designed to provide average lighting level of 1.0 foot-candle. Lastly, roadway lighting poles would be constructed of round tapered aluminum. Regarding building wall mounted lighting, these luminaries would be spaced along building sides to provide sufficient light levels and would be photocell controlled. Further, wall mounted lighting, if included, would feature various distribution patterns as necessary to provide average lighting level of 2.0 to 3.0 foot-candles for the walkways/areas around the buildings. Maintenance lighting would be provided for outdoor open tanks/process areas and would generally be manually controlled and turned on/off by use of light switch. A limited number of fixtures around tanks may be installed to operate automatically (and be on during night hours) for safety.

While the Proposed Project may include the installation of new site lighting, all fixtures would be LED type, and selected and designed to the applicable exterior lighting allowances for the LZ1 zone as established in the CBC. Lighting would also be selected to meet the applicable requirements of the GHWTP Low Effect Habitat Conservation Plan. Specifically, and consistent with Measure 5 of the GHWTP Low Effect Habitat Conservation Plan, all new outdoor lighting bulbs/fixtures installed on site would be certified not to attract nocturnal insects, including Mount Hermon June Beetle. Based on a review of the Santa Cruz Municipal Code, the City does not have established thresholds/value for illumination levels from on-site sources at the project site boundaries. Despite the lack of established illumination/light trespass level at site boundaries, potential off-site light trespass would be minimized by focusing the installation of lighting in similar locations as under existing conditions and using hooded and downward directed luminaires. All installed lighting would be useful (i.e., all lighting would have a clear purpose), targeted, and directed only where needed, and would feature the lowest light level required to provide safety appropriate illumination. In addition, on-site lighting sources would be selected and installed to avoid casting of light outside of the GHWTP property line. Lastly, light levels at GHWTP site boundaries with the Proposed Project would not be excessive due to the presence of on-site vegetation (primarily tall and mature trees) that generally buffer nearby land uses from GHWTP facilities and associated luminaires. Lighting fixtures would be hooded, luminaires would be downward directed, and installation would be targeted to provide adequate site lighting for on-site operations and personnel.

The construction and operation of other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities. Therefore, these Proposed Project components would not entail the introduction of permanent lighting sources to the local environment. If construction of these components occurs during night hours, use of lighting would be limited and focused and fixtures would be hooded and directed downward. Lighting may be installed at staging areas; however, such lighting would only be turned on when needed and would be controlled to not continually illuminate the sky during evening and night hours (lighting would also typically be shielded and directed downward to minimize potential light trespass). Because use of lighting during construction would be infrequent and lighting sources at staging areas would be controlled to minimize unnecessary illumination during evening and night hours, these components would not adversely affect daytime or nighttime views or activities in the area or pose a nuisance.

Overall, construction and operation of the Proposed Project would not create new sources of substantial light that would adversely affecting daytime or nighttime views or activities in the area or pose a nuisance and therefore the impact would be less than significant.

Glare

In addition to the lighting sources described above that may be installed at the GHWTP, exterior finishes of new and upgraded buildings are a potential source of glare. While direct line of sight to new and upgraded buildings from public off-site vantage points is limited due to intervening development, terrain, and vegetation (large trees) that generally block GHWTP buildings from view, exterior finishes are considered herein for disclosure purposes. The updated Operations and Filter Building, Maintenance Building, Chemical Storage and Feed Building, Ozone Building, and Solids Dewatering Building would feature areas of insulated metal panel exteriors. The roofs of these structures would also generally incorporate insulated metal panels.

Despite the inclusion of metal structures and exterior metal finishes/panels, proposed building materials at the GHWTP would not create a new source of substantial glare that would adversely affect daytime views or activities in the area or pose a nuisance. The selection and use of excessively reflective materials is not anticipated and is generally atypical of public service/treatment plant facilities. While use of metal panel exteriors may generate some glare, intervening terrain and vegetation would typical intercept (and/or diminish) glare prior to off-site receipt and visibility. Regarding lighting, all lighting fixtures to be installed on site would be fully shielded and directed downward (and focused), and Dark-Sky Approved by the International Dark Sky Association.[2] Similarly, lighting used for infrequent construction activities occurring outside of the hours of 8:00 AM to 6:00 PM (or during planned shutdowns) would be shielded and directed downward and onto the area of active construction (use of shields would minimize creation of glare). Lastly, and because lighting is currently installed on the GHWTP in similar locations as planned for the Proposed Project, new LED lighting installed on the GHWTP site would not create a new source of substantial glare.

Proposed Project components including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities. Therefore, these Proposed Project components would not entail the introduction of permanent glare sources to the local environment. If construction of these components occurs during night hours, lighting be hooded and directed downward to minimize potential for glare exposure. Lighting may be installed at staging areas; however, such lighting would only be turned on when needed and would be controlled to not continually illuminate the sky during evening and night hours (lighting would also typically be shielded and directed downward to minimize potential trespass and glare). Therefore, these components would not adversely affect daytime or nighttime views or activities in the area or pose a nuisance.

Overall, construction and operation of the Proposed Project would not create new sources of substantial glare that would adversely affect daytime or nighttime views (including ambient nighttime illumination and highly-reflective building materials) and therefore the impact would be less than significant.

[2] The Dark-Sky Approval certifies outdoor lighting fixtures as being Dark-Sky Friendly, meaning that they restrict upward-directed light and have low color temperature. See International Dark Sky Association 2023.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to light or glare, and therefore, no mitigation measures are required.

4.2.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative aesthetics 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 where relevant to this topic. The geographic area of analysis for cumulative impacts related to aesthetics is generally the vicinity of the project site and projects that are located in the same viewshed and therefore only cumulative projects located in the vicinity of the project site and within the same viewshed are considered in the analysis herein.

The Proposed Project would not contribute to cumulative impacts related to scenic resources along a scenic highway or designed scenic roadway (Significance Threshold B) because it would have no impacts related to this threshold, as described above. Therefore, this significance threshold is not further evaluated.

Impact AES-4	Cumulative Aesthetic Impacts (Significance Thresholds A, 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 aesthetics. ***(Less than Significant)***

Known cumulative projects planned within the vicinity of the project site include the Water Capital Investment Program Projects, Santa Cruz Water Rights Project, the Conjunctive Use Plan for the San Lorenzo River Watershed, the Highway 9/San Lorenzo Valley Complete Streets Corridor Plan, the Quail Hollow Road at Zayante Creek Bridge Replacement, and the Quail Hollow Ranch County Park Master Plan Amendment. Each of these cumulative projects would be subject to County or City approval; such projects that require discretionary approval are assumed to be designed or otherwise conditioned to avoid and minimize impacts to aesthetics. As described in Section 3.4.4.1, Construction Scheduling and Sequencing, the GHWTP Concrete Tanks Project is currently under construction and will be complete or nearly complete prior to the commencement of the Proposed Project construction in 2025. As such, it has already been included in the Proposed Project aesthetic analysis and visual simulations. Furthermore, potential cumulative impacts related to aesthetics (affecting scenic vistas, degrading visual character and quality, or generating new sources of light and glare) would be reduced on a site-by-site basis. As described in the analysis above, the Proposed Project impacts would be localized and would not result in construction or design features which could directly or indirectly contribute to an increase in a cumulative aesthetic impact. The Proposed Project would not cumulatively alter aesthetic conditions in the project vicinity.

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 impact related to aesthetics.

4.2.4 References

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4.3 Air Quality

This section describes the existing air quality conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on the air quality modeling 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 C.

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. One public comment was received from a neighboring resident that related to air quality. The letter requested that solar power and battery storage be incorporated into the Proposed Project to eliminate the existing diesel emergency generator and the associated emissions.

4.3.1 Existing Conditions

This section outlines the existing meteorological and topographical conditions of the North Central Coast Air Basin (Air Basin), where the Proposed Project is located, as well as provides an overview of air pollutants, sensitive receptors in the vicinity, and existing ambient air quality monitoring data within the project area.

4.3.1.1 Meteorological and Topographical Conditions

The Proposed Project is located in the Air Basin that 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 (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 within the Air Basin. 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 the fall 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-pressure cell 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).

4.3.1.2 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 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.

1 The descriptions of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (EPA 2022a), 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.

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 that 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 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) 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 (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 (SO_x), 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 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 that 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.

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

Vinyl Chloride

Vinyl chloride is a colorless gas with a mild, sweet odor that 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 2019f). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) (17 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.

4.3.1.3 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). Residential sensitive receptors are located immediately adjacent to or within close proximity to the primary project site, including the GHWTP parcel,

as well as along Ocean Street Extension (sanitary sewer lateral replacement area and Ocean Street Extension staging area), and the Graham Hill Road right-of-way (truck travel route and location for traffic calming measures). In addition, although not considered sensitive receptors under CEQA, workers at the GHWTP were included in the analysis as that site would be the primary location of construction and operational activities. No other sensitive receptors were identified in close proximity to the project site.

4.3.1.4 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 National Ambient Air Quality Standards (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 support 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 California Ambient Air Quality Standards (CAAQS) rather than the NAAQS.

Table 4.3-1 identifies the current attainment status of the Air Basin, including the project site, 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 PM_{10} standard. The Air Basin is designated as unclassified or attainment for all other state and federal standards (EPA 2022b; CARB 2022). Since the Air Basin has met all NAAQS, it is no longer subject to federal conformity requirements (MBARD 2008).

Table 4.3-1. 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
National Standards		
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	Attainment
NO_2	1 hour; annual arithmetic mean	Attainment
CO	1 hour; 8 hours	Unclassified
SO_2	1 hour; 24 hours	Attainment
PM_{10}	24 hours; annual arithmetic mean	Nonattainment
$PM_{2.5}$	Annual arithmetic mean	Attainment

Table 4.3-1. North Central Coast Air Basin Attainment Classification

Pollutant	Averaging Time	Designation/Classification
Lead	30-day average	Attainment
SO4	24 hours	Attainment
H2S	1 hour	Unclassified
Vinyl chloride	24 hours	No designation
Visibility-reducing particles	8 hours (10:00 AM – 6:00 PM)	Unclassified

Sources: CARB 2022 (California); EPA 2022b (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

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 4.3-2 presents the most recent background ambient air quality data from 2019 to 2021. The Santa Cruz monitoring station, located at 2544 Soquel Avenue, Santa Cruz, California, is the nearest air quality monitoring station to the project site. This station monitors O_3 and $PM_{2.5}$. 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 project site. This data is shown in Table 4.3-2 and includes the number of days that the ambient air quality standards were exceeded.

Table 4.3-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2019	2020	2021
Ozone (O_3) – Santa Cruz Monitoring Station				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.068	0.070	0.072
Number of days exceeding state standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.059	0.058	0.058
	0.070 ppm (federal)	0.059	0.057	0.058
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)	0.030	0.032	0.027
	0.100 ppm (federal)	0.030	0.032	0.027
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)	0.004	0.004	0.003
	0.053 ppm (federal)	0.004	0.004	0.003

Table 4.3-2. Local Ambient Air Quality Data

Averaging Time	Ambient Air Quality Standard	Measured Concentration and Exceedances by Year		
		2019	2020	2021
Carbon Monoxide (CO) – Salinas Monitoring Station				
Maximum 1-hour concentration (ppm)	20 ppm (state)	**35**	1.6	7.5
	35 ppm (federal)	35	1.6	7.5
Number of days exceeding state standard (days)		*ND*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Maximum 8-hour concentration (ppm)	9.0 ppm (state)	5.3	1.2	1.3
	9 ppm (federal)	5.3	1.2	1.3
Number of days exceeding state standard (days)		*0*	*0*	*0*
Number of days exceeding federal standard (days)		*0*	*0*	*0*
Fine Particulate Matter ($PM_{2.5}$) – Santa Cruz Monitoring Station				
Maximum 24-hour concentration (µg/m³)	35 µg/m³ (federal)	21.3	**90.4**	17.5
Number of days exceeding federal standard[a]		*0.0 (0)*	*13.0 (13)*	*0.0 (0)*
Annual concentration (µg/m³)	12 µg/m³ (state)	6.5	8.2	4.9
	12.0 µg/m³ (federal)	6.5	8.1	4.8
Coarse Particulate Matter (PM_{10}) – Hollister Monitoring Station				
Maximum 24-hour concentration (µg/m³)	50 µg/m³ (state)	ND	ND	**130.0**
	150 µg/m³ (federal)	130.7	**159.0**	128.8
Number of days exceeding state standard[a]		*ND*	*ND*	*5.1 (5)*
Number of days exceeding federal standard[a]		*0.0 (0)*	*1.0 (1)*	*0.0 (0)*
Annual concentration (state method) (µg/m³)	20 µg/m³ (state)	ND	ND	19.3

Sources: CARB 2023; EPA 2022c.
Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.
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 $PM_{2.5}$. Notably, the CZU Lightning Complex wildfire was determined to be an exceptional event by CARB and likely contributed to the higher than usual levels of particulate matter recorded during that year**.** **Bolded** text shows exceedances.
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.

4.3.2 Regulatory Framework

4.3.2.1 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 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.

4.3.2.2 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 CAAQS that 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 4.3-3 presents the NAAQS and CAAQS.

Table 4.3-3. 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	—	—

Table 4.3-3. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentrations[c]	Primary[c,d]	Secondary[c,e]
Visibility reducing particles	8 hour (10:00 AM to 6:00 PM 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 O3, CO, SO2 (1-hour and 24-hour), NO2, suspended particulate matter—PM10, PM2.5, 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.

[b] National standards (other than O3, NO2, SO2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O3 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 PM10, 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 PM2.5, 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 O3 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 SO2 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 SO2 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 PM2.5 primary standard was lowered from 15 µg/m3 to 12.0 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 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 about 200 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 have a prioritization score (unitless value based on potency, toxicity, quantity, and volume of hazardous materials released from the facility, and the proximity of the facility to potential receptors) of greater than 10 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. Notably, a prioritization score of 10 for a high-priority facility may be considered similar to a calculated cancer risk of 100 chances in one million (i.e., 1 in 10,000), or a hazard index of 10 (SCAQMD 2020). The Proposed Project would not be considered a high-priority facility.

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.

4.3.2.3 Local

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 project site 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.

At the time the 2012-2015 AQMP was written, the Air Basin had been a nonattainment area for the CAAQS for both O_3 and PM_{10}.[4] 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.

The AQMP's emission inventory, a key component of the plan, is an estimate of the amount of O_3 precursors emitted into the air each day by man-made (anthropogenic) activities. The inventory represents emissions of ROG and NO_x (tons per day) on a typical weekday during the May through October O_3 season. The inventory includes stationary sources, area-wide sources, and mobile sources. Stationary sources include typically large facilities such as power plants or cement plants, while area-wide sources include an aggregate of individually smaller sources, which when grouped together have significant emissions such as consumer products or residential fuel consumption. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the Air Basin, as well as other mobile sources such as off-road agricultural and construction equipment, trains, and aircraft (MBARD 2017).

The emissions forecasts consider growth factors, such as population, housing, employment, industrial output, vehicle miles traveled (VMT), etc., developed by state and local agencies, such as Association of Monterey Bay Area Governments (AMBAG). The 2012–2015 AQMP demonstrated how progress had been made toward achieving the O_3 CAAQS between 2006 to 2015 even with some population growth during that same period. Without emission controls, increases in precursor emissions would correspond directly with increases in population. Although the population in the Air Basin has increased slightly, the number of exceedance days continued to decline during the past 10 years. More stringent and protective emissions standards for automobiles, power plants and other sources of ozone precursors have outpaced population growth with the net result being an improvement in air quality. Specifically, the following list from the 2012–2015 AQMP summarizes some of the key programs and rules that have and will continue to reduce emissions while population increases (MBARD 2017):

- CARB's Low Emission Vehicle Program – This program is key to major declines for NO_x and ROG emissions from on-road motor vehicles.
- CARB's Off-Road Motor Vehicle Program – Similar to the above program, CARB's off-road motor vehicle program is responsible for reductions in NO_x emissions from diesel powered off-road trucks, agricultural equipment and other heavy-duty equipment.
- CARB's Advanced Clean Cars – This CARB program promotes new technologies for motor vehicles including low emission and zero emission vehicles as well as clean fuels.

[4] The Air Basin is currently designated attainment of the O_3 CAAQS, and therefore, the MBARD is no longer required to update the AQMP.

- **District Rule 431, Emissions from Electric Power Boilers** – This rule reduced the MBARD's NO_x inventory by about 20 tons per day due to reductions from the Moss Landing Power Plant. Total NO_x emissions from the plant, including its newer high efficiency gas turbines are less than 2 tons per day.
- **District Rule 1002 Transfer of Gasoline into Vehicle Fuel Tanks** – This rule continues to produce a better than 90% reduction in ROG as well as toxic emissions from the gasoline vapors emitted during refueling of motor vehicles.
- **District Rule 426 Architectural Coatings** — The purpose of this Rule is to limit the emissions of VOCs in the formulation of various architectural coatings.

Of note, the 2012–2015 AQMP indicates that despite a significant overall increase in population of over 152,292 persons within the Air Basin between 2010 and 2035 (21% increase), emissions of NO_x are expected to decrease by over 20 tons per day (44% decrease) in that same time period.

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 support 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.

4.3.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of 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.

4.3.3.1 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 CAAQS and NAAQS (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 SO_x, and 82 pounds per day of PM_{10} from on-site sources. 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 that 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}). For localized CO, the MBARD does not have screening levels for intersection traffic

that could result in potential CO hotspots; however, several other air districts have established these levels, which are described below to provide context of the magnitude of hourly volumes that could result in significant localized CO:

- The South Coast Air Quality Management District conducted CO modeling for its 2003 AQMP (SCAQMD 2003) for the four worst-case intersections in the South Coast Air Basin. At the time the 2003 AQMP was prepared, the intersection of Wilshire Boulevard and Veteran Avenue was the most congested intersection in Los Angeles County, with an average daily traffic volume of approximately 100,000 vehicles per day. Using CO emission factors for 2002, the peak modeled CO 1-hour concentration was estimated to be 4.6 ppm at the intersection of Wilshire Boulevard and Veteran Avenue. Accordingly, CO concentrations at congested intersections would not exceed the 1-hour or 8-hour CO CAAQS unless projected daily traffic would be at least more than 100,000 vehicles per day.
- The Bay Area Air Quality Management District determined that projects would result in a less-than-significant impact to localized CO concentrations if (1) project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour, or (2) project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway) (BAAQMD 2017).

The Bay Area Air Quality Management District screening criterion of 24,000 vehicles per hour has been applied to the Proposed Project as a metric to evaluate CO hotspots, since it is the most conservative of the screening volumes.

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. For context, the National Cancer Institute estimates that approximately 39.5% of people will be diagnosed with cancer during their lifetimes (National Cancer Institute 2020). A cancer risk of 10 in a million indicates that a person has an additional risk of 10 chances in a million (0.001%) of developing cancer during their lifetime as a result of the air pollution scenario being evaluated, which is minimal and defined as the "No Significant Risk Level" for carcinogens in Proposition 65. 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.[5]

4.3.3.2 Analytical Methods

Potential impacts related to air quality were identified using modeling. Specifically, emissions from construction and operation of the Project and existing land uses were estimated using the California Emissions Estimator Model (CalEEMod) Version 2022.1.[6] CalEEMod input parameters, including the Proposed Project land use type and size and construction schedule, were based on information provided by the City, or default model assumptions if Proposed Project specifics were unavailable. The results of the air quality modeling are summarized in this section and are included in Appendix C. Additional information on how impacts were analyzed is provided below.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices), that would be implemented during construction to avoid or minimize effects to air quality. Standard construction

[5] 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.

[6] CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant emissions associated with the construction and operational activities from a variety of land use projects, such as residential, commercial, and industrial facilities.

practices #1 (erosion control), #3 (wind erosion control), and #21 (construction equipment exhaust control) apply to the Proposed Project. Where applicable, these practices and their effectiveness in avoiding and minimizing effects are described in Section 4.3.3.3, Project Impact Analysis.

Construction

For the purpose of estimating Proposed Project emissions, construction was modeled beginning in November 2024 and concluding December 2028. This construction schedule represents the worst-case scenario for construction emissions even though it is likely that construction would not commence until 2025, as described in Chapter 3, Project Description.[7] Facility development at the GHWTP and improvements in other areas of the primary project site (storm drain and sewer pipeline replacement) were accounted for in the modeling. Notably, the modeling conservatively assumes condensed phases that occur for the entire duration of the activity for simplicity; however, actual construction would be more episodic based on the facility components being constructed at any one time. For instance, demolition is anticipated to be performed intermittently throughout the first 2 years of the Proposed Project as structures are sequentially retrofitted and then put back online, and grading would occur intermittently on a structure-by-structure basis. The analysis contained herein is based on the following schedule assumptions (duration of phases is approximate):

GHWTP Facility Construction:

- Site preparation: November 2024 – November 2024
- Demolition: January 2025 – July 2025
- Grading: February 2025 – May 2025
- Building construction: February 2025 – September 2028
- Architectural coating: August 2025 – December 2025
- Paving: October 2028 – December 2028

Storm Drain and Sewer Pipeline Replacement Construction:

- Linear, grubbing and land clearing: February 2025
- Linear, grading and excavation: February 2025 – April 2025
- Linear, drainage, utilities, and subgrade: April 2025 – May 2025
- Linear, paving: May 2025

Construction modeling assumptions for equipment and vehicles are provided in Table 4.3-4. For all components, it was assumed that approximately 20,000 cubic yards of soil would be exported, and 12,000 cubic yards of structural fill would be imported. For the analysis, it was generally assumed that heavy-duty construction equipment would be operating at the site 5 days per week. To account for the City's standard construction practices, the modeling accounts for watering exposed areas two times per day during earthwork activity and that all off-road equipment greater than 75 horsepower will have Tier 4 Interim engines.

[7] The analysis assumes a construction start date of November 2024, which represents the earliest date construction would initiate. Assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutant and greenhouse gas emissions, because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Table 4.3-4. Construction Scenario Assumptions

Construction Phase	Average Daily One-Way Vehicle Trips			Equipment		
	Worker Trips	Vendor Truck Trips	Haul Truck Trips	Equipment Type	Quantity	Daily Usage Hours
GHWTP Construction						
Site Preparation	18	2	0	Rubber Tired Dozers	3	8
				Tractors/ Loaders/ Backhoes	4	8
Demolition	16	0	2	Rubber Tired Dozers	2	8
				Excavators	3	8
				Concrete/Industrial Saws	1	8
Grading	16	2	60	Graders	1	8
				Excavators	1	8
				Tractors/ Loaders/ Backhoes	3	8
				Rubber Tired Dozers	1	8
Building Construction	52	20	0	Forklifts	3	8
				Generator Sets	1	8
				Cranes	1	7
				Welders	1	8
				Tractors/ Loaders/ Backhoes	3	7
Architectural Coatings	12	0	0	Air Compressors	1	6
Paving	16	0	0	Pavers	2	8
				Paving Equipment	2	8
Storm Drain and Sewer Pipeline Replacements						
Linear, Grubbing & Land Clearing	20	2	0	Signal Boards	2	8
				Crawler Tractors	2	8
				Excavators	4	8
Linear, Grading & Excavation	80	2	0	Excavators	6	8
				Crawler Tractors	2	8
				Graders	4	8
				Rollers	4	8
				Signal Boards	2	8
				Tractors/ Loaders/ Backhoes	8	8
				Rubber Tired Loaders	2	8
				Scrapers	4	8
Linear, Drainage,	56	0	0	Scrapers	2	8
				Rough Terrain Forklifts	2	8

Table 4.3-4. Construction Scenario Assumptions

Construction Phase	Average Daily One-Way Vehicle Trips			Equipment		
	Worker Trips	Vendor Truck Trips	Haul Truck Trips	Equipment Type	Quantity	Daily Usage Hours
Utilities, and Sub-Grade				Tractors/ Loaders/ Backhoes	6	8
				Signal Boards	2	8
				Graders	2	8
				Plate Compactors	2	8
				Pumps	2	8
				Air Compressors	2	8
				Generator Sets	2	8
Linear, Paving	40	0	0	Rollers	4	8
				Paving Equipment	2	8
				Pavers	2	8
				Tractors/ Loaders/ Backhoes	6	8
				Signal Boards	2	8

Source: Appendix C.

Operation

Operational criteria air pollutant emissions were estimated for mobile, area, and energy sources for the Proposed Project and existing baseline scenarios using CalEEMod. A net change from baseline analysis was then conducted to estimate the net change in emissions resulting from Proposed Project implementation. The first full year of project operations was assumed to be 2029, consistent with the anticipated end of construction. The existing scenario was based on year 2022, to reflect the release date of the Notice of Preparation for the EIR for the Proposed Project, which establishes the basis for the existing conditions. The calculation of operational air pollutant emissions is explained below.

Mobile Sources

The Proposed Project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of employee passenger vehicles (workers) and truck traffic associated with the operation of the facility. Based on the infrequent occurrence of truck traffic, mobile sources were modeled on a maximum/worst case day and annual basis, with the max day used to compare to MBARD criteria air pollutant thresholds, and annual emissions for the greenhouse gas inventory (see Section 4.8, Greenhouse Gas Emissions).

Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within CalEEMod, which is based on the CARB EMFAC2021 model. Emission factors representing the vehicle mix and emissions for year 2029 (for the Proposed Project) and year 2022 (for existing baseline) were used to estimate emissions associated with vehicular sources (i.e., trucks and passenger vehicles). The “general light industrial” and “industrial park” land uses were used with separate fleet mixes in order to model passenger cars and trucks, respectively. For passenger vehicles, the default fleet mix was adjusted to reflect passenger only type vehicles composed of light-duty auto, light-duty trucks, and medium-duty vehicles. The trucks were assumed to consist of

medium-heavy-duty and heavy-duty trucks. For the Proposed Project, it was assumed that 15 employees (30 one-way trips) with an average trip length of 9.88 miles and 3 trucks (6 one-way trips) (one truck each for chemical delivery, future granular activated carbon (GAC) replacement, and sludge removal) with an average trip length of 142 miles would occur on the maximum day.[8] For the existing baseline, it was assumed that 15 employees (30 one-way trips) with an average trip length of 9.88-miles and 1 truck (2 one-way trips) (one truck for chemical delivery) with an average trip length of 50 miles would occur on the maximum day. Note, that there is no net increase in employee trips with the Proposed Project, as indicated above, as no new staff would be hired to operate the upgraded facilities.

For the purpose of this analysis, it is assumed that all mobile source emissions generated by the Proposed Project would occur within the MBARD jurisdictional boundaries. Assuming all mobile source emissions are included in the Proposed Project's criteria air pollutant emissions inventory prior to comparing emissions to the MBARD thresholds represents a conservative assumption. Nonetheless, it is acknowledged that due to the assumed trip length for some truck trips, especially the GAC trips to Compton, California, that portions of trips and associated mobile source emissions could occur outside of the MBARD jurisdictional boundaries and within other air district boundaries. However, as detailed in Impact AIR-2 below, since the total mobile source emissions are minimal and truck trips would be infrequent, further apportionment by air district would not be meaningful as the split would be negligible.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating and water heating are calculated in the building energy use module of CalEEMod, as described in the following text.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2022). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of nonresidential buildings and on the default factor of pounds of VOCs per building square foot per day. For the asphalt surface land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on the square footage of parking surface area and pounds of VOCs per square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers used during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of nonresidential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The model default reapplication rate of 10% of area per year is assumed.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values.

[8] The average truck trip length is based on chemical delivery trips of 50 miles, GAC replacement trips to Compton, California of 356 miles, and sludge removal trips of 20 miles.

Energy Source Emissions

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, because criteria pollutant emissions occur at the site of the power plant, which is typically off-site. Therefore, for the purposes of the air quality analysis, the energy source parameters focus on criteria air pollutants generated because of natural gas consumption within the built environment. Natural gas consumption is attributed to systems like heating, ventilation, and air conditioning and water heating. Notably, the Proposed Project would be all-electric and would reduce natural gas consumption currently required for the existing facility.

Off-Road Equipment

For the Proposed Project, although they would operate infrequently, one propane forklift (modeled as compressed natural gas) and one extendable forklift were assumed to operate 8 hours on the maximum day. For the existing baseline, only one propane forklift was assumed to operate for 8 hours on the maximum day.

Stationary Sources (Emergency Generators)

The Proposed Project would continue to operate the existing diesel-fueled 2,092-horsepower emergency, back-up generator, which was assumed to operate one-hour a day for up to 50-hours a year for routine testing and maintenance.

Health Risk Assessments

Construction Health Risk Assessment

A health risk assessment (HRA) was performed to evaluate potential health risk associated with construction of the project. The following discussion summarizes the dispersion modeling and HRA methodology; supporting construction HRA documentation, including detailed assumptions, is presented in Appendix C.

The greatest potential for TAC emissions during Proposed Project construction would be DPM emissions from heavy equipment operations and heavy-duty trucks. Use of heavy-duty construction equipment is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce diesel particulate emissions and use of diesel trucks is also subject to an Airborne Toxics Control Measure. Additionally, the City's standard construction practice #21 requires Tier 4 Interim engines for off-road equipment greater than 75 horsepower. The HRA conducted for the Proposed Project analyzes long-term cancer and noncancer health risk from the Proposed Project's use of diesel equipment and trucks during construction at the GHWTP. A construction HRA CalEEMod run was performed to estimate onsite emissions of exhaust PM_{10}, which was used as a surrogate for DPM.[9] The predominant source of construction exhaust PM_{10} is operation of offroad diesel construction equipment. However, it was conservatively assumed that all vehicles would travel 0.25-miles to represent potential onsite travel and nearby local offsite travel. Total exhaust PM_{10} emissions from CalEEMod were averaged over the Proposed Project's construction duration to estimate the annual and hourly exposure.

[9] Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. CalEPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

The most recent guidance from the Office of Environmental Health Hazard Assessment (OEHHA) is the 2015 Risk Assessment Guidelines Manual (OEHHA 2015). Cancer risk parameters, such as age-sensitivity factors, daily breathing rates, exposure period, fraction of time at home, and cancer potency factors were based on the values and data recommended by OEHHA as implemented in Hotspots Analysis and Reporting Program Version 2 (HARP2).

The dispersion modeling for the HRA was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (Version 22112), which is the model MBARD requires for atmospheric dispersion of emissions. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion and scaling concepts, including treatment of surface and elevated sources, building downwash, and simple and complex terrain. A unit emission rate (1 gram per second) was normalized over the line of adjacent volume sources[10] for the AERMOD run to obtain the "X/Q" values. X/Q is a dispersion factor that is the average effluent concentration normalized by source strength and is used as a way to simplify the representation of emissions from Proposed Project construction. Two AERMOD runs were conducted depending on whether the receptors were residents or workers. Principal parameters of this modeling are presented in Table 4.3-5.

Table 4.3-5. Construction Health Risk Assessment American Meteorological Society/ Environmental Protection Agency Regulatory Model Principal Parameters

Parameter	Details
Meteorological Data	AERMOD-specific meteorological data for the Watsonville Airport air monitoring station (KWVI) was used for the dispersion modeling based on the recommendation of the MBARD. A meteorological data set from 2015 through 2019 was obtained from CARB in a preprocessed format suitable for use in AERMOD.
Urban versus Rural Option	Urban areas typically have more surface roughness as well as structures and low-albedo surfaces that absorb more sunlight—and thus more heat—relative to rural areas. Based on the Proposed Project location, the rural dispersion option was selected.
Terrain Characteristics	Digital elevation data were imported into AERMOD and elevations were assigned to receptors and emission sources, as necessary. Digital elevation data were obtained through the AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a resolution of 1 arc-second resolution.
Source Release Characterizations	Air dispersion modeling of DPM emissions was conducted assuming the off-road equipment and trucks would operate in accordance with the modeling scenario estimated in CalEEMod, based on the best information available at the time of analysis: ▪ Off-road equipment and trucks were modeled as a lines of adjacent volume sources across the Proposed Project areas to be demolished/ constructed, as well as the off-site corridor for the storm drain/ and sewer pipeline replacements, with a release height of 5 meters, a plume height of 10 meters, and plume width of 10 meters.
Receptors	▪ For the residential run, a 2-kilometer by 2-kilometer receptor grid with 100-meter spacing and a 1-kilometer by 1-kilometer grid with 50-meter spacing were placed over the facility and surrounding area. Additional discrete receptors were placed at the residences adjacent to the facility boundary if the receptor grids did not include them. ▪ For the worker run, discrete receptors were placed at buildings on the project site.

Source: Appendix C.
Notes: AERMOD = American Meteorological Society/Environmental Protection Agency Regulatory Model; MBARD = Monterey Bay Air Resources District; DPM = diesel particular matter; CalEEMod = California Emissions Estimator Model.

[10] A volume source is a three-dimensional source of diffuse air pollutant emissions that is used to model releases unrestricted by any physical means.

Dispersion of DPM emissions was modeled using AERMOD, then the concentration plot files were used to estimate cancer risk and noncancer health impacts at the residential and worker receptors using CARB's HARP2. HARP2 implements the OEHHA age-weighting methodology for assessing toxics risks. The exposure parameters included in HARP2 for the different receptors are described below:

- For residential receptors during project construction, DPM exposure was assumed to begin in the 3rd trimester of pregnancy (assumed to be the worst-case scenario for cancer risk) for a duration of 4.15 years (Proposed Project construction).
- For on-site worker receptors during project construction, TAC exposure was assumed to begin at 16 years old for a duration of 4.15 years.

The OEHHA Derived Method was used to estimate cancer and chronic noncancer risk. The cancer and chronic risk results were then compared to MBARD thresholds to assess the Proposed Project's impact significance. There is no reference exposure level for acute health impacts from DPM, and, thus, acute risk was not evaluated.

Operational Heath Risk Assessment

In order to determine the incremental increase in health risk associated with the Proposed Project (i.e., risk above the existing baseline conditions), only new sources of TACs were evaluated, including additional diesel truck trips and the diesel-fueled extendable forklift. As with the construction HRA described above, emissions dispersion of TACs were modeled using AERMOD, then cancer risk and noncancer health impacts subsequently using the CARB HARP2. The majority of parameters identified in Table 4.3-5 were also incorporated into AERMOD for the operational HRA. Unique parameters of the operational HRA modeling include the following source release characteristics:

- Diesel truck travel was modeled as a line of adjacent volume sources at the project site and south along Graham Hill Road with a release height of 3.4 meters, a plume height of 6.8 meters, and plume width of 9.7 meters.
- The forklift was modeled as a line of adjacent volume sources at the project site with a release height of 3.4 meters, a plume height of 6.8 meters, and plume width of 9.7 meters.

The exposure parameters included in HARP2 for the operational HRA are described below:

- For residential receptors during Proposed Project operation, DPM exposure was assumed to begin in the 3rd trimester of pregnancy (assumed to be the worst-case scenario for cancer risk) for a duration of 30 years.[11]
- For on-site worker receptors during Proposed Project operation, DPM exposure was assumed to begin at 16 years old for a duration of 25 years.[12]

The cancer and chronic risk results were then compared to MBARD thresholds to assess the Proposed Project's impact significance.

[11] OEHHA describes cancer risk evaluations for 9-, 30-, and 70-year exposure durations in the 2015 Risk Assessment Guidelines Manual, and identifies that the 9- and 30-year durations correspond to the average and high-end of residency time recommended by the EPA, with the 30-year exposure duration recommended for use as the basis for estimating cancer risk at the maximally exposed individual resident in all HRAs (OEHHA 2015).

[12] The initial age of 16 years with a duration of 25 years are the default worker exposure parameters identified in the 2015 Risk Assessment Guidelines Manual (OEHHA 2015).

4.3.3.3 Project Impact Analysis

Impact AIR-1	Conflict with an Applicable Air Quality Plan (Significance Threshold A). Construction and operation of the Proposed Project would result in emissions of criteria pollutants but would not exceed adopted thresholds of significance and therefore would not conflict with the MBARD's AQMP. ***(Less than Significant)***

As described in the MBARD CEQA Guidelines (2008), project emissions that are not accounted for in the AQMP's emission inventory would result in a significant cumulative impact to regional air quality. However, for construction of a project, exhaust emissions are accounted for in the AQMP emissions inventory (MBARD 2018), and therefore Proposed Project construction emissions would not result in a significant impact. Furthermore, as determined in Impact AIR-2 (discussed below), the Proposed Project would result in emissions during short-term construction and long-term operations that would not exceed the MBARD thresholds of significance. In addition, the Proposed Project would not generate growth not anticipated in the development of the AQMP since it would not result in an increase in staff for long-term operations. As such, construction and operation of the Proposed Project would not conflict with or obstruct implementation of the AQMP and 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 an applicable air quality plan, and therefore, no mitigation measures are required.

Impact AIR-2	Criteria Pollutant Emissions (Significance Threshold B). Construction and operation of 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 and long-term operational activities associated with the Proposed Project would result in a minimal increase in daily criteria air pollutant emissions and would not exceed the applicable MBARD thresholds. MBARD considers emissions of ROG, NO_X, and PM_{10} from an individual project that exceed the applicable emissions thresholds to be a substantial contribution to a cumulative impact on regional air quality, and projects that do not exceed the project-level thresholds may conclude that they are not cumulatively considerable. 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 described below.

Construction

Proposed construction activities would result in the temporary addition of pollutants to the local airshed caused by off-road construction equipment, soil disturbance, ROG off-gassing from architectural coatings and asphalt pavement application, as well as 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, such emissions levels can only be estimated, with a corresponding uncertainty in precise ambient air quality impacts.

As discussed in Section 4.3.3.3, Analytical Methods, criteria air pollutant emissions associated with temporary construction activity were quantified using CalEEMod based on the construction scenario presented in Table 4.3-4. Construction schedule assumptions, including phase type, duration, and sequencing, were based on information provided by the City and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed project information was not available.

The City would implement standard construction practices as part of the Proposed Project. These standard construction practices require the implementation of erosion control best management practices and wind erosion (dust) controls, such as watering active construction areas, hydroseeding and/or applying non-toxic soil binders to exposed areas after cut and fill activities, covering all trucks hauling loose materials (such as dirt and sand) off-site, and installing appropriate track-out capture methods for exiting trucks. They also require higher tier engines for equipment greater than 75 horsepower. These standard construction practices are described in Section 3.4.4.4 and provided below:

- Standard Construction Practice #1 (Erosion Control). Implement and maintain effective erosion and sediment control measures at all times of the year. Measures may include:
  a. Install silt fencing, fiber or straw wattles, and/or rice straw bales on slopes and along limits of work/ construction areas to break up and filter surface runoff.
  b. Utilize additional erosion control including native duff, jute netting, etc.
  c. Utilize additional sediment control including fencing, dams, barriers, berms, traps, and associated basins.
  d. Cover of stockpiled spoils.
  e. Install rolling dips and revegetation on temporary accessways.
  f. Physical stabilization/revegetation of disturbed or graded areas including staging areas, prioritizing the use of native species for revegetation where appropriate.
  g. Install sediment containment measures for all active and inactive stockpiles, spoil disposal sites, concrete wash sites, stabilization structures, and other debris areas, such as Visqueen plastic sheeting, fiber or straw wattles, gravel bags, and hydroseed.
  h. Locate construction storage areas outside of any stream channel, and a minimum distance of 65 feet away from any jurisdictional aquatic resource.
  i. All erosion and sediment control materials shall avoid the use of plastic mesh.
  j. Prior to forecasted and following all rain events, all erosion and sediment control devices shall be inspected for their performance and repaired or replaced immediately if they are found to be deficient.
- Standard Construction Practice #3 (Wind Erosion Control). Implement wind erosion control measures as necessary to prevent construction-related dust generation. Measures may include:
  a. Water active construction areas to control fugitive dust.
  b. Apply hydroseed and/or non-toxic soil binders to exposed cut and fill areas after cut and fill operations.
  c. Cover inactive storage piles.
  d. Cover trucks hauling dirt, sand, or loose materials off site.
  e. Install appropriately effective track-out capture methods at the construction site for all exiting vehicles.

- **Standard Construction Practice #21 (Construction Equipment Exhaust Control).** For projects utilizing off-road diesel-fueled equipment within 750 feet of sensitive receptors for more than one-year, all diesel-fueled off-road construction equipment greater than 75 horsepower shall be zero-emissions or equipped with California Air Resources Board (CARB) Tier 4 Final or Interim compliant engines. Alternatively, CARB Tier 2 or Tier 3 compliant engines can be used if CARB Level 3 Verified Diesel Emissions Control Strategy (VDECS) filters are added to each piece of off-road diesel-fueled equipment. An exemption from these requirements may be granted by the City of Santa Cruz, at the Water Director's discretion, when equipment with the required tier is not reasonably available and when corresponding reductions in diesel particulate matter are achieved from other construction equipment on the project. An exemption may only be granted if total estimated project-generated construction emissions will not exceed applicable MBARD risk thresholds as verified using industry-standard emission estimation methodologies. This measure does not apply to linear projects (e.g., pipelines) as sensitive receptors would not be exposed for long durations.

To account for the City's standard construction practices, the modeling accounts for watering exposed areas two times per day during earthwork activity and that all off-road equipment greater than 75 horsepower will have Tier 4 Interim engines. Construction emissions associated with the Proposed Project are depicted in Table 4.3-6. Details of the emission calculations are provided in Appendix C.

Table 4.3-6. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
2024	—	—	—	—	—	—
2025	13.59	92.17	154.16	0.28	9.25	3.25
2026	0.81	10.02	17.67	0.03	0.57	0.22
2027	0.79	9.94	17.50	0.03	0.57	0.21
2028	0.78	9.85	17.35	0.03	0.56	0.21
Winter						
2024	0.73	14.90	29.28	0.05	7.90	4.07
2025	13.59	92.72	154.07	0.28	9.25	3.25
2026	0.81	10.10	17.65	0.03	0.57	0.22
2027	0.79	10.01	17.49	0.03	0.57	0.21
2028	0.76	9.91	17.33	0.03	0.56	0.21
2024	0.73	14.90	29.28	0.05	7.90	4.07
Maximum Daily Emissions	**13.59**	**92.72**	**154.16**	**0.28**	**9.25**	**4.07**
MBARD Threshold	*N/A*	*N/A*	*N/A*	*N/A*	*82*	*N/A*
Threshold Exceeded?	**N/A**	**N/A**	**N/A**	**N/A**	**No**	**N/A**

Source: Appendix C
Notes: ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; MBARD = Monterey Bay Air Resources District.
As construction is anticipated to begin in the Winter of 2024, no emissions were estimated for Summer 2024. Emissions include compliance with the City's standard construction practice #1 (erosion control), #3 (wind erosion), and #21 (construction equipment exhaust control).

As shown in Table 4.3-6, Proposed Project construction would not exceed MBARD's daily thresholds. Therefore, Proposed Project construction impacts associated with criteria air pollutant emissions would be less than significant.

Operations

Emissions from the operational phase of the Proposed Project and existing baseline scenarios were estimated using CalEEMod. Table 4.3-7 presents the net change in maximum daily mobile, area, energy source, off-road equipment, and stationary source emissions associated with operation of the Proposed Project and operation of the existing facility. The values shown are the maximum summer or winter daily emissions (i.e., worst-case) results from CalEEMod. Details of the emission calculations are provided in Appendix C.

Table 4.3-7. Estimated Maximum Daily Operation Criteria Air Pollutant Emissions

Emissions Source	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Project						
Mobile	0.12	3.39	2.04	0.03	1.00	0.29
Area	1.89	0.00	2.72	<0.01	<0.01	<0.01
Energy – Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment	0.07	1.94	10.97	<0.01	0.02	0.02
Stationary	4.70	21.03	11.99	0.02	0.69	0.69
Total	**6.79**	**26.36**	**27.72**	**0.05**	**1.72**	**1.00**
Existing						
Mobile	0.13	0.54	1.44	<0.01	0.29	0.08
Mobile	0.13	0.54	1.44	<0.01	0.29	0.08
Energy – Natural Gas	0.01	0.17	0.14	<0.01	0.01	0.01
Off-Road Equipment	0.00	0.88	8.80	0.00	0.00	0.00
Stationary	4.70	21.03	11.99	0.02	0.69	0.69
Total	**6.09**	**22.63**	**24.17**	**0.02**	**1.00**	**0.79**
Net Change in Emissions						
Net Change (Project – Existing)	**0.70**	**3.73**	**3.55**	**0.03**	**0.72**	**0.21**
MBARD Threshold	*137*	*137*	*550*	*150*	*82*	*N/A*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**N/A**

Source: Appendix C
Notes: ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; MBARD = Monterey Bay Air Resources District.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. Columns may not add due to rounding. Values of "<0.01" indicate that the estimated emissions are less than 0.01 pounds per day.

As shown in Table 4.3-7, the net increase in criteria air pollutant emissions associated with Proposed Project operations would not exceed MBARD's significance thresholds and, therefore, operational impacts associated with criteria air pollutant emissions would be less than significant.

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.

Impact AIR-3	Exposure of Sensitive Receptors (Significance Threshold C). The Proposed Project would not expose sensitive receptors to substantial pollutant concentrations during short-term construction or during long-term operations. (***Less than Significant***)

Health Impacts of Toxic Air Contaminants

Construction Health Risk

As discussed in Section 4.3.3.2, a construction HRA was performed to estimate the potential health risk for proximate residential and worker receptors associated with Proposed Project construction. Notably, as there is no reference exposure level for acute health impacts from DPM, acute risk was not evaluated in the construction HRA. Results of the construction HRA are presented in Table 4.3-8 and include the application of City standard construction practice #21 described in detail in Impact AIR-2. Detailed model outputs are presented in Appendix C.

Table 4.3-8. Construction Health Risk Assessment Results

Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Cancer Risk – MEIR	Per Million	7.52	10.0	Less than Significant
Chronic Hazard Index – MEIR	Not Applicable	0.0035	1.0	Less than Significant
Cancer Risk – MEIW	Per Million	0.46	10.0	Less than Significant
Chronic Hazard Index – MEIW	Not Applicable	0.0085	1.0	Less than Significant

Source: Appendix C
Notes: CEQA = California Environmental Quality Act; MEIR = Maximum Exposed Individual Resident; MEIW = Maximum Exposed Individual Worker.
Risk estimates account for compliance with the City's standard construction practice #21 (construction equipment exhaust control).

As shown in Table 4.3-8, the results of the construction HRA for the Proposed Project demonstrate that the construction emissions would result in a potential incremental increase in cancer risk and chronic risk that would each be below the respective MBARD significance thresholds at the Maximum Exposed Individual Resident (MEIR) and the Maximum Exposed Individual Worker (MEIW). Therefore, the impact of the Proposed Project related to construction TAC emissions would be less than significant impact.

Operational Health Risk

As discussed in Section 4.3.3.2, an HRA was performed to estimate the potential health risk for proximate residential and worker receptors associated with Proposed Project operations. Results of the operational HRA are presented in Table 4.3-9. Detailed model outputs are presented in Appendix C.

Table 4.3-9. Operational Health Risk Assessment Results

Impact Parameter	Units	Impact Level	CEQA Threshold	Level of Significance
Cancer Risk – MEIR	Per Million	0.44	10	Less than Significant
Chronic Hazard Index – MEIR	Index Value	0.0001	1.0	Less than Significant
Cancer Risk – MEIW	Per Million	0.038	10	Less than Significant
Chronic Hazard Index – MEIW	Index Value	0.0001	1.0	Less than Significant

Source: Appendix C.
Notes: CEQA = California Environmental Quality Act; MEIR = Maximum Exposed Individual Resident; MEIW = Maximum Exposed Individual Worker.

As shown in Table 4.3-9, the DPM emissions from operation of the Proposed Project would result in a potential incremental increase in cancer risk and chronic risk that would each be below the respective MBARD significance thresholds at the MEIR and the MEIW. The Proposed Project operational DPM health risk impacts would be less than significant.

CO Hotspots

Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. Localized areas where ambient concentrations exceed federal and/or state standards for CO are termed CO "hotspots." CO transport is extremely limited and disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels affecting sensitive receptors. Typically, high CO concentrations are associated with severely congested intersections operating at an unacceptable level of service (LOS) (LOS E or worse is unacceptable). Projects contributing to adverse traffic impacts may result in the formation of a CO hotspot. Additional analysis of CO hotspot impacts would be conducted if a project would result in a significant impact or contribute to an adverse traffic impact at a signalized intersection that would potentially subject sensitive receptors to CO hotspots.

Title 40 of the Code of Federal Regulations, Section 93.123(c)(5), 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 that 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 CFR 93.123). While project construction would involve on-road vehicle trips from trucks and workers during construction, construction activities would last approximately 4 years and would not require a project-level construction hotspot analysis.

With no new employees and potentially a few new truck trips in a day, the Proposed Project would generate negligible new traffic trips and would not exceed the 24,000 vehicles per hour screening criterion. Accordingly, Proposed Project-related traffic would not exceed CO standards and therefore, no further analysis was conducted for CO impacts. Therefore, the CO emissions impact of the Proposed Project would be less than significant.

Health Impacts of Other Criteria Air Pollutants

Construction and operation of the Proposed Project would not result in emissions that would exceed any of the MBARD thresholds for criteria air pollutants (see Impact AIR-2).

Health effects associated with O_3 include respiratory symptoms, worsening of lung disease leading to premature death, and damage to lung tissue (CARB 2019b). ROG and NO_x are precursors to O_3. The health effects associated with O_3 are generally associated with 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. 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. However, because the Proposed Project would not exceed MBARD thresholds for ROG or NO_x and the Air Basin is designated as in attainment of the NAAQS and CAAQS for O_3, implementation of the Proposed Project would not significantly contribute to regional O_3 concentrations or the associated health effects.

In addition to O_3, NO_x emissions contribute to potential exceedances of the NAAQS and CAAQS for NO_2 (since NO_2 is a constituent of NO_x). Health effects associated with NO_x and NO_2 include lung irritation and enhanced allergic responses (CARB 2019c). Because the Proposed Project would not generate NO_x emissions that would exceed the MBARD mass daily threshold and because the Air Basin is designated as in attainment of the NAAQS and CAAQS for NO_2 and the existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards, the Proposed Project would not contribute to exceedances of the NAAQS and CAAQS for NO_2 or result in significant health effects associated with NO_2 and NO_x.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (CARB 2019d). CO tends to be a localized impact associated with congested intersections. Impacts associated with CO hotspots were identified above as less than significant. Thus, the Proposed Project's CO emissions would not contribute to the health effects associated with this pollutant.

Health effects associated with PM_{10} include premature death and hospitalization, primarily for worsening of respiratory disease (CARB 2017). Construction and operation of the Proposed Project would not exceed MBARD's PM_{10} thresholds and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the Air Basin from coming into attainment for this pollutant. Regarding $PM_{2.5}$, the Air Basin is designated as in attainment for the NAAQS and CAAQS. Additionally, the Proposed Project would implement construction dust control through compliance with the City's standard construction practices #1, #3, and #21 (see Impact AIR-2), which limit the amount of fugitive dust and off-road equipment particulate exhaust generated during construction. Due to the minimal contribution of particulate matter during construction and operation, the Proposed Project would not result in significant health effects associated with PM_{10} or $PM_{2.5}$.

Based on the preceding considerations, because construction and 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 NAAQS and CAAQS, and the NAAQS and CAAQS are established to protect public health and welfare, it is anticipated that the Proposed Project would not result in health effects associated with criteria air pollutants and the impact would be less than significant.

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-4	Result in Other Emissions Adversely Affecting a Substantial Number of People (Significance Threshold D). Construction and operation of the Proposed Project would not result in other emissions that would adversely affect a substantial number of people. ***(Less than Significant)***

Based on available information, the Proposed Project is not anticipated to result in other emissions that have not been addressed under Impact AIR-1 through Impact AIR-3, above. As such, this analysis focuses on the potential for the Proposed Project to generate odors.

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, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the project site 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 operational odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries. Regarding operations, the Proposed Project involves improvements to the existing GHWTP infrastructure and any odors produced would be minimal and would be similar to existing conditions. Unlike biological sludge produced at sewage treatment plants, drinking water treatment plants generate water treatment residuals with solids that are inert and not odorous. 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 odors, and therefore, no mitigation measures are required.

4.3.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative air quality impacts from 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 where relevant to the topic. 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. As such, all projects identified in Table 4.0-1 are relevant to this discussion.

Impact AIR-5	Cumulative Air Quality Impacts (Significance Thresholds A, B, C, and D). 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 air quality. ***(Less than Significant)***

Air Quality Management Plan

As described under Impact AIR-1, Proposed 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). Notably, construction exhaust emissions are accounted for in the AQMP emissions inventory (MBARD 2018). Since the Proposed Project would result in typical construction activities that would generate exhaust emissions that are accounted for in the AQMP, and since the net increase in long-term operational emissions would be minimal, the Proposed Project would be consistent with the AQMP, as discussed in Impact AIR-1. Therefore, the cumulative impact of the Proposed Project related to conflicts with MBARD's AQMP would be less than significant.

Criteria Air Pollutants

By its nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants (i.e., CAAQS for PM_{10}) is a result of past and present development, and the MBARD develops and implements plans for future attainment of these 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. Specifically, MBARD considers criteria air pollutant emissions from an individual project that exceed the applicable emissions thresholds to be a substantial contribution to a cumulative impact on regional air quality, and projects that do not exceed the project-level thresholds may conclude that they are not cumulatively considerable. 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-2. As previously discussed, the Proposed Project would not exceed the MBARD significance thresholds for any criteria air pollutant. Therefore, the cumulative impact of the Proposed Project related to construction and operations would be less than significant.

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-3, 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 ambient air quality standards, which are established to protect public health and welfare.

TACs have a localized impact, with the geographic context consisting of other development projects and sensitive receptors proximate[13] to the GHWTP and storm drain and sewer pipeline replacement areas. The emissions of multiple TACs, including DPM emissions, from cumulative projects could result in a significant cumulative impact to air quality in locations where receptors are exposed to high concentrations of TACs over the long term. Notably, the MBARD has not developed cumulative health risk thresholds. However, as described under Impact AIR-3, short-term construction and long-term operation of the Proposed Project would be short term and resultant health impacts would be less than significant. As such, TACs emitted during Proposed Project construction and operations would not be cumulatively considerable. Therefore, the cumulative impact of the Proposed Project related to substantial pollutant concentrations would be less than significant.

Odors

Odors are a localized impact. As indicated in Impact AIR-4, 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. Therefore, cumulative impacts related to odor would be less than significant.

4.3.4 References

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[13] The Bay Area Air Quality Management District identifies a 1,000-foot 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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4.4 Biological Resources

This section describes the existing biological resources of the biological study area (BSA), which constitutes the project site and a 300-foot buffer. It also identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The existing conditions in this section are based on the Biological Resources Existing Conditions Report (BREC) (Dudek 2022) for the Proposed Project, prepared to support this environmental impact report (EIR). The results of the BREC are summarized in this section and the entire report is 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. One comment letter related to biological resources was received from the California Department of Fish and Wildlife (CDFW). Specifically, the CDFW letter recommends: (1) avoiding or limiting the use of artificial lighting during dawn and dusk hours, when wildlife species are most active; and (2) outdoor lighting be shielded, cast downward, does not spill onto other properties or upwards into the night sky; and (3) outdoor lighting be limited to warm light colors with an output temperature of 2700 kelvin (K) or less. Proposed Project lighting is specifically evaluated in Section 4.2, Aesthetics. The letter also recommends that the EIR provide habitat assessments for special-status species, and states that the EIR analysis should discuss: (1) possible encroachments into riparian habitats, drainage ditches, wetlands, or other sensitive areas; (2) potential for impacts to special-status species or sensitive natural communities; (3) potential loss or modification of breeding, nesting, dispersal, and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features; (4) permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic, or human presence; and (5) potential obstruction of movement corridors, fish passage, or access to water sources and other core habitat features. The CDFW comment letter also provides a list of special-status species from the California Natural Diversity Database (CNDDB) within 5-mile radius of the project site and recommends a riparian buffer zone of 50-feet to limit development and vegetation clearing. The letter also requests that the EIR analyzes site-specific noise impacts in terms of potential habitat disturbance.

4.4.1 Existing Conditions

Information on biological resources occurring or potentially occurring in the project sites was obtained by reviewing pertinent literature, mapping vegetation communities and land cover, evaluating the BSA's potential to support special-status plant and wildlife species, and conducting a preliminary jurisdictional aquatic resources assessment. This section summarizes information presented in the BREC report (Appendix D).

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3 in Chapter 3, Project Description.

4.4.1.1 Vegetation Communities and Land Cover Types

The BSA supports nine natural vegetation communities and eight non-natural land cover types. Detailed descriptions of each vegetation community or land cover type are provided in Appendix D. Table 4.4-1 summarizes and Figures 4.4-1A through 4.4-1D depict the areal extent of each vegetation community or land cover type in the BSA.

Table 4.4-1. Summary of Vegetation Communities and Land Cover Types

Vegetation Community or Land Cover	CDFW Code*	Area (acres)[1]				
		Primary Project Site[2]	Mt. Hermon Road Staging Area	Ocean Street Extension Staging Area	Biological Study Area 300-foot Buffer	Total
Forest and Woodland Alliances and Stands						
Black cottonwood forest and woodland	61.120.00	0.1	–	0.2	4.6	4.9
California bay forest and woodland	74.100.00	0.3	–	–	4.5	4.8
California sycamore woodlands	61.310.00	–	0.1	–	7.7	7.8
Coast live oak woodland and forest	71.060.00	4.9	–	0.2	27.9	33.0
Douglas fir forest and woodland	82.200.00	0.3	–	–	0.3	0.7
Ponderosa pine forest and woodland	87.010.00	–	–	–	0.6	0.6
Redwood forest alliance	86.100.00	0.7	–	–	8.4	9.1
Subtotal Forest and Woodland Alliances and Stands	–	6.3	0.1	0.4	54.0	60.8
Shrubland Alliances and Stands						
Coyote brush scrub	32.060.23	0.5	0.1	–	1.4	1.9
Subtotal Shrubland Alliances and Stands	–	0.5	0.1	–	1.4	1.9
Herbaceous Alliances and Stands						
Wild oats and annual brome grasslands	42.027.00	1.4	0.1	–	3.4	4.9
Subtotal Herbaceous Alliances and Stands	–	1.4	0.1	–	3.4	4.9
Non-Natural Land Covers/Unvegetated Communities						
Agricultural	–	0.01	–	–	5.5	5.5
Dirt road	–	–	<0.1	–	0.1	0.1
Disturbed habitat	–	0.01	–	1.2	2.4	3.6
Eucalyptus grove	79.100.00	–	–	–	0.1	0.1
Monterey pine forest and woodland	–	–	–	–	0.4	0.4

Table 4.4-1. Summary of Vegetation Communities and Land Cover Types

Vegetation Community or Land Cover	CDFW Code*	Area (acres)[1]				
		Primary Project Site[2]	Mt. Hermon Road Staging Area	Ocean Street Extension Staging Area	Biological Study Area 300-foot Buffer	Total
Rural residential	—	1.7	—	—	55.4	57.1
Urban/Developed	—	7.3	4.8	0.1	18.5	30.7
Wattle (*Acacia* sp.) groves	—	—	—	0.2	2.0	2.2
Subtotal Non-Natural Land Covers/ Unvegetated Communities	—	9.1	4.8	1.4	84.4	99.8
Total	**—**	**17.1**	**5.1**	**1.9**	**143.3**	**167.4**

Notes:
CDFW = California Department of Fish and Wildlife; GHWTP = Graham Hill Water Treatment Plant; Ext = Extension

* CDFW Code per CDFW 2022a.

1 Totals may not sum due to rounding.

2 The primary project site includes the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way.

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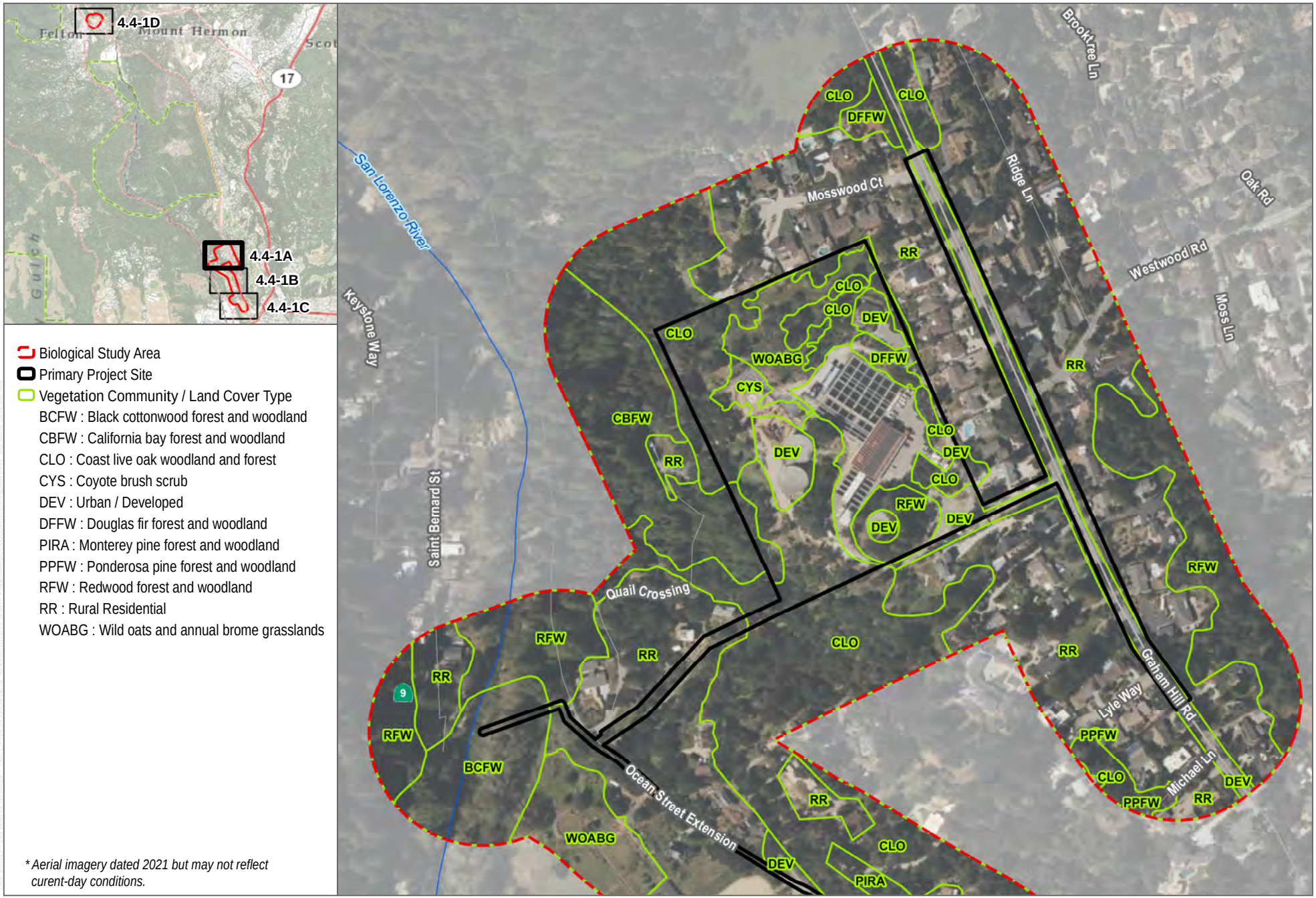

SOURCE: Bing Maps 2021*

FIGURE 4.4-1A

Vegetation Communities and Land Covers - Graham Hill Water Treatment Plant

Graham Hill Water Treatment Plant Facility Improvements Project

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SOURCE: Bing Maps 2021*

DUDEK

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FIGURE 4.4-1B

Vegetation Communities and Land Covers - Alternate Sanitary Sewer Lateral Replacement Area

Graham Hill Water Treatment Plant Facility Improvements Project

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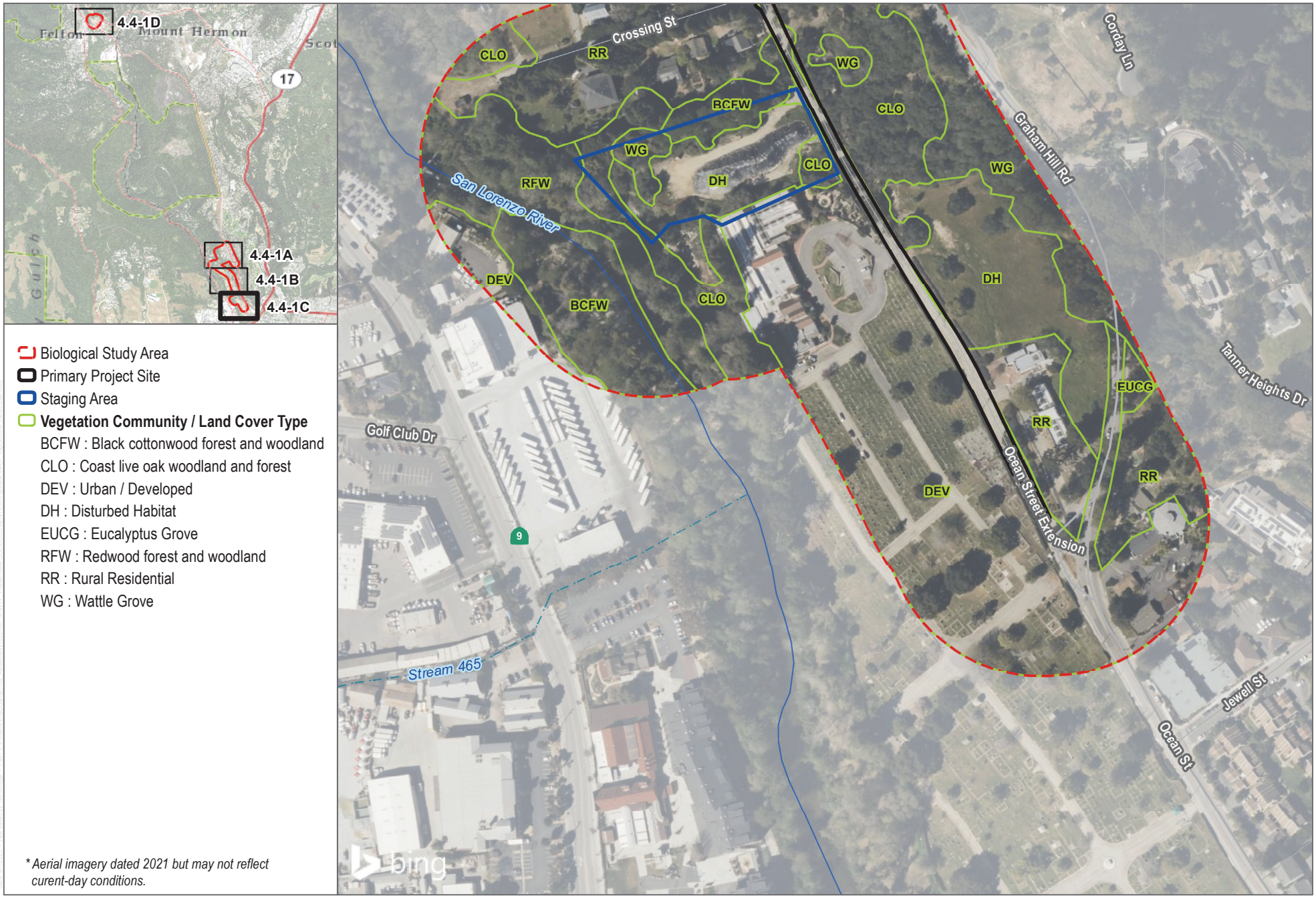

SOURCE: Bing Maps 2021*

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FIGURE 4.4-1C

Vegetation Communities and Land Covers - Ocean Street Extension Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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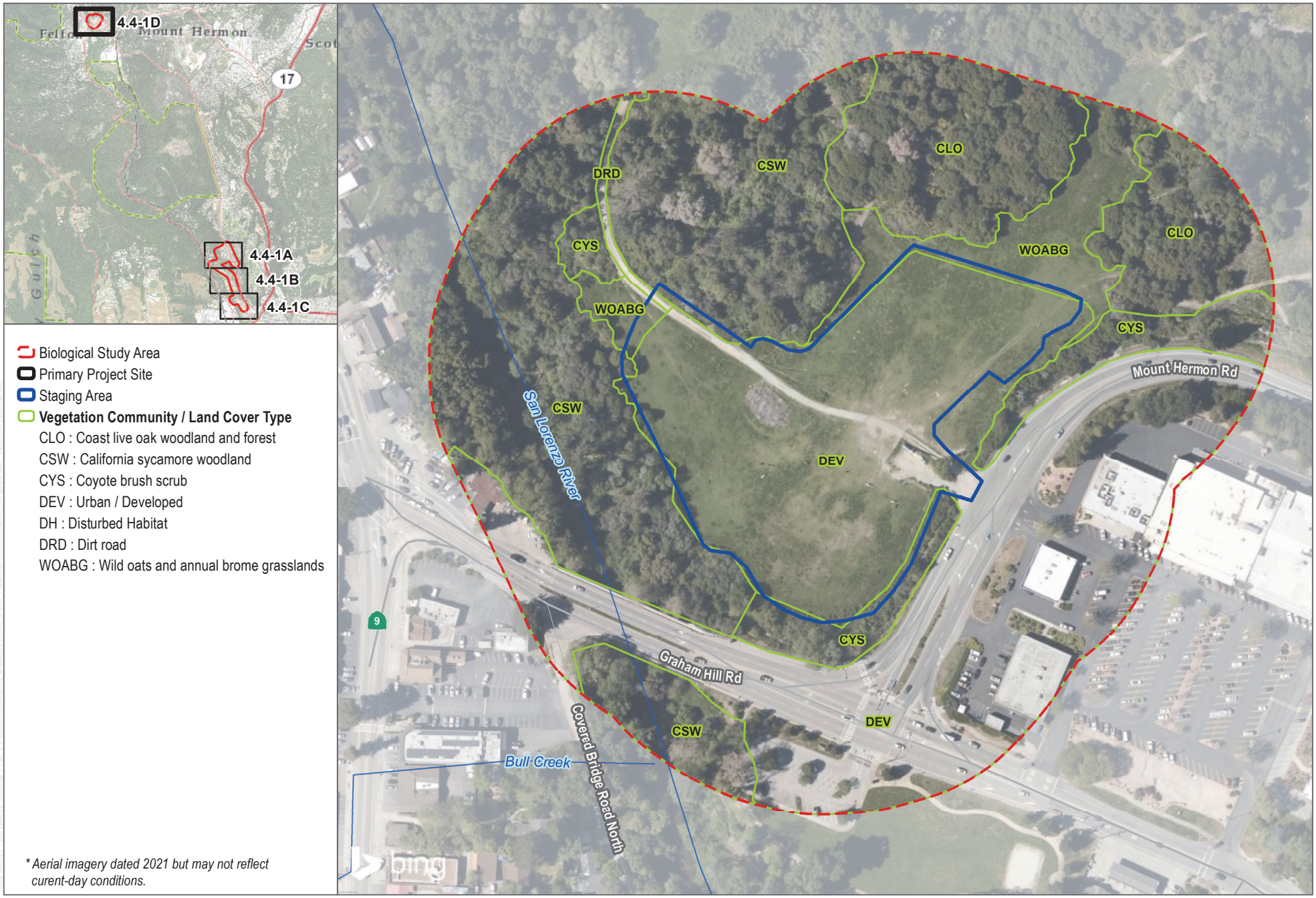

SOURCE: Bing Maps 2021*

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FIGURE 4.4-1D

Vegetation Communities and Land Covers - Mt. Hermon Road Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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4.4.1.2 Special-Status Biological Resources

Special-status biological resources occurring or potentially occurring in or near the BSA were determined based on Dudek's literature review and results of field surveys. The following special-status biological resources are discussed below: sensitive vegetation communities, special-status plants, special-status wildlife, jurisdictional wetlands and waters, and wildlife corridors and habitat linkages. Figures 4.4-2A through 4.4-2D provide known special-status species observations in or near the BSA.

Sensitive Natural Communities

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 (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). Natural communities with an S rank of S1, S2, or S3 are considered "sensitive" by CDFW and are typically addressed during the California Environmental Quality Act (CEQA) review process. Within the BSA, four vegetation communities are designated as sensitive by CDFW: black cottonwood forest and woodland, California bay forest and woodland, California sycamore woodland, and redwood forest and woodland. All four have an S-rank of S3 (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).

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 include most areas mapped as black cottonwood forest and woodland, and California bay forest and woodland. However, portions of these communities also transition into upland, non-riparian settings. Also, smaller, unmapped stands may occur wherever water is available.

Two additional sensitive habitat types are mapped by the County and protected under County Code 16.32: Special Forests and Sandhills Habitat. Both habitat types are defined and mapped in the County General Plan (County of Santa Cruz 1994). Special forests are forests that are unique natural communities; limited in supply and distribution; threatened by substantial disturbance from human activities; and habitat for rare, endangered, and/or locally unique species of plants and animals. No special forests have been mapped within the BSA. Sandhills habitat occurs in the Scotts Valley, San Lorenzo Valley, and Bonny Doon areas, where Zayante soils provide habitat for several special-status species endemic to this area (i.e., found nowhere else in the world). While the County has mapped sandhills habitat in the western portion of the primary project site on the GHWTP parcel, a soils investigation by HDR in 2020 revealed that the soils consist of engineered fills and loamy soils instead of the sandy soils characteristic of Sandhills Habitat. Neither of these sensitive habitats occur within the BSA.

Special-Status Plants

Special-status plants include those listed, or candidates for listing, as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) and/or CDFW, and species identified as rare by the California Native Plant Society (particularly California Rare Plant Rank [CRPR] 1A – presumed extinct in California; CRPR 1B – rare, threatened, or endangered throughout its range; and CRPR 2 – rare or endangered in California, more common elsewhere). No special-status plant species were observed within the BSA during focused surveys from April through July 2021

(McGraw 2021; Appendix B of Appendix D), nor have they been observed during previous surveys (Harris & Associates 2019; McGraw 2021-2023).

Dudek biologists performed a desktop review of literature, existing documentation, and GIS data to evaluate the potential for special-status plant species to occur within the BSA. Out of 42 special-status plant species identified as occurring or potentially occurring in the BSA, only six special-status plant species were determined to have a moderate potential to occur in the BSA (Table 4.4-2). For detailed descriptions of the special-status plant species refer to Appendix D.

SOURCE: Bing Maps 2021, HDR 2021

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FIGURE 4.4-2A

Known Special-Status Species Observations and Potentially Jurisdictional Aquatic Resources - Graham Hill Water Treatment Plant

Graham Hill Water Treatment Plant Facility Improvements Project

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SOURCE: Bing Maps 2021, HDR 2021

FIGURE 4.4-2B

DUDEK

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Known Special-Status Species Observations and Potentially Jurisdictional Aquatic Resources - Alternate Sanitary Sewer Lateral Replacement Area

Graham Hill Water Treatment Plant Facility Improvements Project

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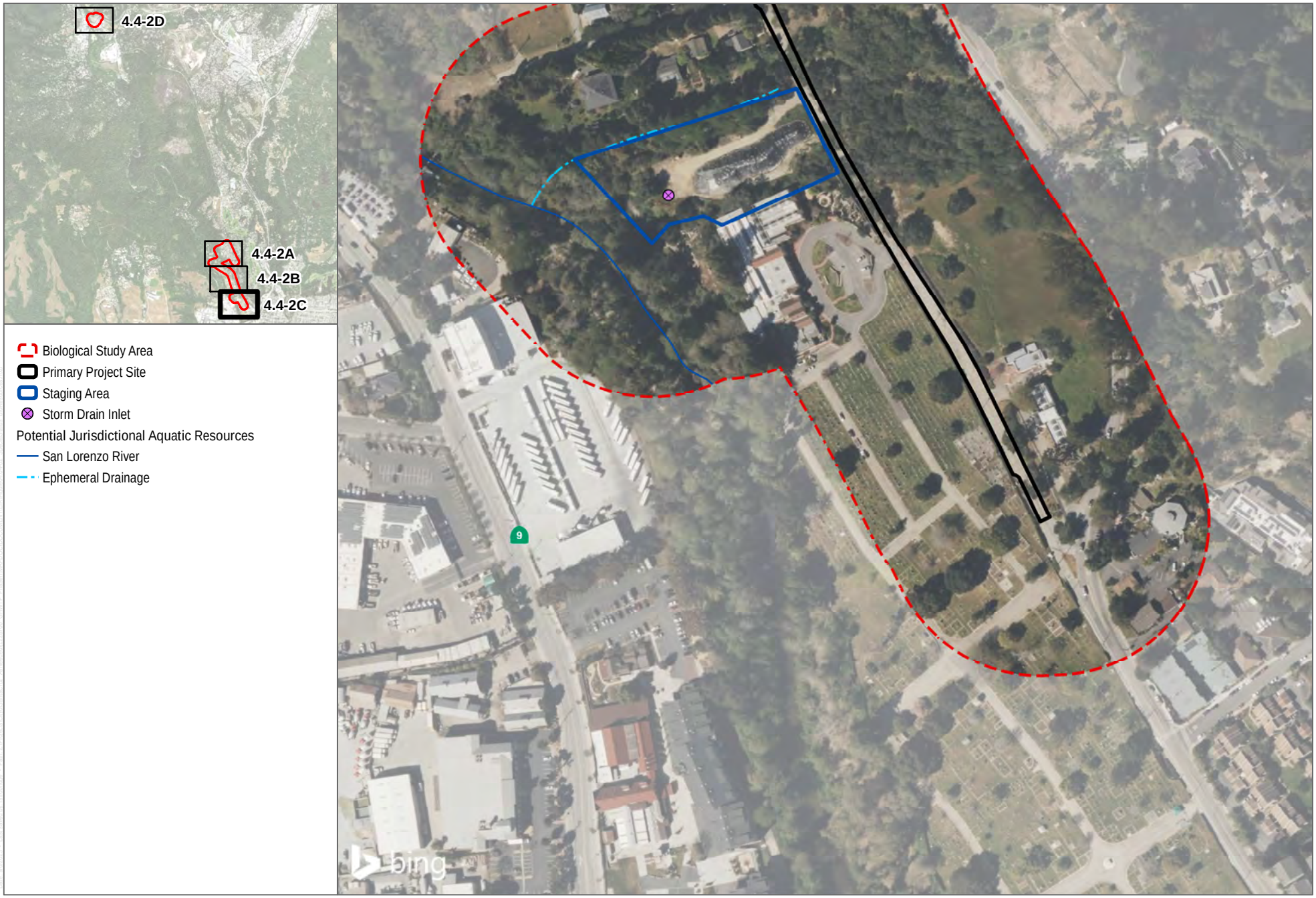

SOURCE: Bing Maps 2021, HDR 2021

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FIGURE 4.4-2C

Known Special-Status Species Observations and Potentially Jurisdictional Aquatic Resources - Ocean Street Extension Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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SOURCE: Bing Maps 2021, HDR 2021

DUDEK

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FIGURE 4.4-2D

Known Special-Status Species Observations and Potentially Jurisdictional Aquatic Resources - Mt. Hermon Road Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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Table 4.4-2. Special-Status Plant Species with at Least a Moderate Potential to Occur within the Biological Study Area

Common Name	Scientific Name	Federal/State/CRPR	Potential
Ben Lomond buckwheat	*Eriogonum nudum* var. *decurrens*	None/None/1B.1	**Moderate.** Occurs on Zayante soils within chaparral, cismontane woodland, and lower montane woodland coniferous forest. The closest CNDDB occurrence was documented within 0.1 miles in 2017 (CDFW 2022b; No. 1).
Ben Lomond spineflower	*Chorizanthe pungens* var. *hartwegiana*	FE/None/1B.1	**Moderate.** Occurs on Zayante soils in lower montane coniferous forest (CDFW 2022b; CNPS 2021). The closest CNDDB occurrence was documented approximately 20 feet southwest of the BSA in 1988 (CDFW 2022b; No. 3).
northern curly-leaved monardella	*Monardella sinuata* ssp. *nigrescens*	None/None/1B.2	**Moderate.** Occurs in sandy soils in coastal dune, coastal scrub, and lower montane coniferous forest habitats. Suitable woodland, grassland, and/or Ponderosa pine sandhill habitat are present within the BSA. The closest CNDDB occurrence was documented immediately northeast of the BSA in 1993 (CDFW 2022b; No. 11).
robust spineflower	*Chorizanthe robusta* var. *robusta*	FE/None/1B.1	**Moderate.** Occurs in maritime chaparral, cismontane woodlands, and coastal dune habitats. Suitable open woodland habitat is present within the BSA. The CNDDB lists eight occurrences within the region (CDFW 2022b).
silverleaf (Bonny Doon) manzanita	*Arctostaphylos silvicola*	None/None/1B.2	**Moderate.** Occurs in closed-cone coniferous forest, chaparral, lower montane coniferous forest, and inland marine sands/perennial evergreen shrub (CDFW 2022b; CNPS 2022). Suitable forest and shrub habitat are present within the BSA. The closest CNDDB occurrence was documented within chaparral/sandhill habitat approximately 0.06 miles southwest of the BSA in 2014 (CDFW 2022b; No. 1).
woodland woolythreads	*Monolopia gracilens*	None/None/1B.2	**Moderate.** Occurs on serpentine soils in opening within broadleafed upland forests, chapparal, cismontane woodland, north coast coniferous forests, and foothill grassland. The BSA supports suitable habitat for this species, and the CNDDB lists 31 occurrences throughout the County (CDFW 2022b).

Sources: CDFW 2022b; CNPS 2022.
Status Legend
Federal
FE: Federally endangered
CRPR (California Rare Plant Rank)
CRPR 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)

Special-Status Wildlife

Special-status wildlife include those listed, or candidates for listing, as threatened or endangered by USFWS and CDFW, and designated as species of special concern by CDFW and sensitive by USFWS. Multiple San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) middens were observed within the BSA during the April 2021 and December 2022 surveys. Additionally, the federally endangered Mount Hermon June beetle (*Polyphylla barbata*) is historically known to occur (from 2004 and 2008) within a small patch of ponderosa pine forest habitat at GHWTP (City of Santa Cruz 2013). San Francisco dusky-footed woodrat is the only special-status wildlife species observed in the BSA during surveys for the Proposed Project.

Dudek biologists performed a desktop review of literature, existing documentation, and GIS data to evaluate the potential for special-status wildlife species to occur within the BSA. Of the 42 special-status wildlife species identified as occurring or potentially occurring in the BSA, only four were determined to have a moderate potential to occur, two were determined to have a high potential to occur, and two are known to occur in the BSA (Table 4.4-3). For detailed descriptions of the special-status wildlife species refer to Appendix D. There is no USFWS-designated critical habitat for listed wildlife species within the BSA (USFWS 2022).

Table 4.4-3. Special-Status Wildlife Species Detected or with at Least a Moderate Potential to Occur in the Biological Study Area

Common Name	Scientific Name	Federal/State	Potential to Occur in Biological Study Area
Steelhead (central California coast DPS)	*Oncorhynchus mykiss irideus*	FT/None	**Known.** Steelhead is known to occur in the San Lorenzo River.
Pacific lamprey	*Entosphenus tridentatus*	None/SSC	**Known.** Pacific lamprey is known to occur in the San Lorenzo River. During a 2002 survey, they were caught or observed in 12 of the 16 mainstem reaches of the river that were sampled and 16 of 19 tributary reaches (City of Santa Cruz 2021a).
Amphibians			
California giant salamander	*Dicamptodon ensatus*	None/SSC	**Moderate.** California giant salamander has a moderate potential to occur in riparian vegetation along the San Lorenzo River reaches within the BSA.
Santa Cruz black salamander	*Aneides flavipunctatus niger*	None/SSC	**Moderate.** Santa Cruz black salamander has a moderate potential to occur in riparian vegetation along the San Lorenzo River reaches within the BSA.
Reptiles			
western pond turtle	*Actinemys marmorata*	None/SSC	**Moderate.** Western pond turtle has moderate potential to occur in the San Lorenzo River reaches within the BSA. The closest CNDDB occurrences were documented approximately 6 miles northwest of the BSA in 1993 (CDFW 2022b; No. 76).

Table 4.4-3. Special-Status Wildlife Species Detected or with at Least a Moderate Potential to Occur in the Biological Study Area

Common Name	Scientific Name	Federal/State	Potential to Occur in Biological Study Area
Birds			
white-tailed kite	*Elanus leucurus*	None/FP	**Moderate.** 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 Reserve, approximately 1.5 miles west of the BSA (CDFW 2022b) and they have also been observed within 0.5 mile of the Mt. Hermon staging area (SCWD obs.).
Mammals			
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	None/SSC	**High.** Seven woodrat middens were observed at the project site just north and south of the existing water tanks. One additional woodrat midden was observed within the project site for the alternate sanitary sewer lateral replacement area. The middens that were inspected showed signs of previous occupation by woodrats and could be active or were active at one time. Because San Francisco dusky-footed woodrat cannot be distinguished phenotypically from the more widely distributed dusky-footed woodrat and the BSA is within the range of the San Francisco dusky-footed woodrat, it is anticipated that these middens could be used by San Francisco dusky-footed woodrats.
Invertebrates			
Mount Hermon June beetle	*Polyphylla barbata*	FE/None	**High.** The species is historically known to occur within an approximately 0.8-acre patch of ponderosa pine forest on the primary project site (City of Santa Cruz 2013). Surveys in 2004 and 2008 detected the species immediately south of the water tank to the paved service road, and subsequent monitoring indicated that a very small population persists at the site (City of Santa Cruz 2013).

Source: CDFW 2022b.
Status Legend
Federal
FE: Federally endangered
State
FP: Fully protected
SSC: California species of special concern

Jurisdictional Aquatic Resources

Jurisdictional aquatic resources include waters (i.e., wetlands and non-wetland waters) of the United States under U.S. Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the federal Clean Water Act (CWA), waters of the state under Regional Water Quality Control Board (RWQCB) jurisdiction pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, and streams and lakes under CDFW jurisdiction pursuant to Section 1602 of the California Fish and Game Code (CFGC). Several potentially jurisdictional features were identified within the primary project site and the Ocean Street Extension staging area of the BSA, as described below.

The San Lorenzo River, a perennial stream with direct connection to the Pacific Ocean, runs along the western edge of the BSA, along the western end of the utility corridor portion of the primary project site. The mainstem and active channel would be regulated as a water of the United States and state by the USACE and RWQCB and a stream by CDFW under Section 1602 of the CFGC, and the lateral extent of the associated riparian vegetation communities would also be subject to CDFW jurisdiction under CFGC Section 1602.

One concrete v-ditch located north of the water tanks and treatment tanks within the primary project site did not support any vegetation nor evidence of frequent surface water transport/storage. This v-ditch and other small storm drains and roadside ditches are isolated, non-natural features would most likely not be regulated as waters of the United States or state.

One ephemeral drainage was identified along the south side of the primary project site near the fence line. This erosional feature is the result of concentrated stormwater runoff which will be directed into the storm drain collection system by the current construction activity at the site. This ditch does not support any distinctive riparian vegetation or species typically associated with natural drainage features. During the time of the site visit (April 2021), this feature was dry and appeared to support surface water only during and immediately after precipitation events.

One small 0.02-acre seep that occurs within the primary project site just west of the water tanks was previously mapped in 2018 (Harris & Associates 2019). This feature occurs on a slope within an opening of the mixed evergreen forest and supported non-native plants. Its source of water is unknown but may have been created by leakage from the concreate storage tanks that are currently being replaced.

An ephemeral drainage along the northern edge of the Ocean Street Extension staging area appears to have been excavated to transport surface water away from the parcel and possibly to the San Lorenzo River located to the west. Due to its non-natural origins, further study would be required to determine its jurisdictional status and extent.

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 ensuring 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. The San Lorenzo River is a regionally significant drainage that flows along the western portion of the BSA, along the western end of the utility corridor portion of the primary project site. This river corridor is likely used by several common and special-status wildlife species as cover and foraging habitat, and to move between adjacent similar habitats. However, the BSA is not recognized as an important regional wildlife corridor by any state agency or jurisdiction, and it is not considered critical to the ecological functioning of adjoining watersheds and open space areas.

4.4.2 Regulatory Framework

4.4.2.1 Federal

Clean Water Act

The Federal Water Pollution Control Act of 1972 (CWA) (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 CWA 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), 2019 (formal repeal of the WOTUS Rule), 2020 (Navigable Waters Protection Rule, NWPR), and 2021 (Pasqua Tribe et al v. United States Environmental Protection Agency resulting in remand and vacatur of the NWPR and a return to the "pre-2015 regulatory regime") have attempted to provide greater clarity to the term and its regulatory implementation. On December 30, 2022, the U.S. Environmental Protection Agency (EPA) and the USACE announced a final rule (Rule) establishing a new definition of "waters of the United States" that restores federal jurisdiction over waters that were protected prior to 2015 under the CWA for traditional navigable waters, the territorial seas, interstate waters, as well as upstream water resources that significantly affect those waters. The Rule was published in the Federal Register on January 18, 2023, and is effective on March 20, 2023.

There are two key changes that the Rule incorporates. Firstly, the Rule reinstates the "Significant Nexus" test. The "Significant Nexus" test refers to waters that either alone, or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable waters, interstate waters, or the territorial seas (86 FR 69372-69450). The "Significant Nexus" test attempts to establish a scientific connection between smaller water bodies, such as ephemeral or intermittent tributaries, and larger, more traditional navigable waters such as rivers. Significant nexus evaluations take into consideration hydrologic and ecologic factors including, but not limited to, volume, duration, and the frequency of surface water flow in the resource and its proximity to a traditional navigable water, and the functions performed by the resource on adjacent wetlands. Second, the Rule adopts the "Relatively Permanent Standard" test. To meet the "Relatively Permanent Standard" water bodies must be relatively permanent, standing, or continuously flowing and have a continuous surface connection to such waters.

On May 25, 2023, the Supreme Court issued its long-anticipated decision in Sackett v. EPA., in which it rejected the EPA's claim that "waters of the United States," as defined in the CWA, includes wetlands with an ecologically significant nexus to traditional navigable waters. The Supreme Court held that only those wetlands with a continuous surface connection to traditional navigable waterways would be afforded federal protection under the

CWA. Specifically, to assert jurisdiction over an adjacent wetland under the CWA, a party must establish that (1) the adjacent body of water constitutes water[s] of the United States (i.e., a relatively permanent body of water connected to traditional interstate navigable waters) and (2) the wetland has a continuous surface connection with that water, making it difficult to determine where the water ends and the wetland begins. The Rule will need to be modified by the Biden administration in light of this decision.

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." In the absence of wetlands, the limits of USACE jurisdiction in non-tidal waters, such as intermittent streams, extend to the "ordinary high water mark" that is defined in 33 CFR 328.3(c)(7) as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." Discharges into waters of the United States are regulated under Section 404 of the CWA by the USACE.

In California, the State Water Resources Control Board (SWRCB) and RWQCBs are responsible for implementing Section 401 of the CWA and related elements of the California Water Code (see Section 2.2.4 Porter-Cologne Water Quality Act).

Important applicable sections of the CWA 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 of 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 more than minimal impacts to the aquatic environment and require a lengthier public review process.

Federal Endangered Species Act

The federal Endangered Species Act (FESA) of 1973, as amended, (16 USC 1531 et seq.) serves as the enacting legislation to list, conserve, and protect threatened and endangered species, and the ecosystems on which they depend, from extinction. The FESA is administered by the USFWS for terrestrial and freshwater fish species and by the National Marine Fisheries Service (NMFS) for marine and anadromous species. Section 9(a)(1)(B) of the FESA prohibits the taking, possession, sale, or transport of any endangered fish or wildlife species. "Take" is defined to

mean “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 USC 1532 (19)). Harm is defined as “any act that kills or injures the species, including significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (50 CFR 17.3).

The FESA also enables the USFWS and NMFS to designate critical habitat, which is defined specific geographic areas, whether occupied by listed species or not, that contain “physical or biological features essential to the conservation of the species” and that “may require special management considerations or protection” (50 CFR 424.12). Designated critical habitat units, published in the Federal Register by USFWS or NMFS, are often large and may contain areas that do not provide habitat for the species. Only areas within the critical habitat units that support the species’ primary constituent elements (PCEs) are subject to FESA consultation and analysis of critical habitat effects. PCE was a term introduced in the critical habitat designation regulations to describe aspects of ‘‘physical or biological features.’’ On May 12, 2014, USFWS and NMFS proposed to revise these regulations to remove the use of the term ‘‘primary constituent elements’’ and replace it with the statutory term ‘‘physical or biological features’’ (79 FR 27066). However, the shift in terminology does not change the approach used in conducting a ‘‘destruction or adverse modification’’ analysis, which is the same regardless of whether the original designation identified PCE, physical or biological features, or both (81 FR 7220, 2/11/16).

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 two HCPs approved by the USFWS, both of which were co-developed by the City; these HCPs are described below.

City of Santa Cruz Operations and Maintenance Habitat Conservation Plan

The City developed the Operations and Maintenance Habitat Conservation Plan (OMHCP) 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 (ITP) (No. TE89655D-0) for the OMHCP, which covers six wildlife and four plant species: Ohlone tiger beetle (*Cicindela ohlone*; federally endangered), Mount Hermon June beetle (MHJB), 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 OMHCP 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 OMHCP was 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 2021a).

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

The City developed a low-effect habitat conservation plan (LEHCP) 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 ITP (No. TE15139B-0) for LEHCP that covers incidental take of MHJB, 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 MHJB. To mitigate for unavoidable impacts to MHJB, 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 MHJB and potentially other species that rely on sandhills habitat.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act 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 Migratory Bird Treaty Act 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.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 USC 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. The main purpose of the Essential Fish Habitat provisions is to avoid loss of fisheries due to disturbance and degradation of the fisheries habitat.

4.4.2.2 State

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 (collectively Water Boards) as the principal state agencies responsible for the protection of water quality in California. The Central Coast RWQCB has regulatory authority over portions of the BSA. 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 RWQCB 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.

California Endangered Species Act

The California Endangered Species Act (CESA) (CFGC Section 2050 et seq.) prohibits the "take" of any plant, fish, or wildlife species listed as endangered or threatened, or designated as candidates for listing, under CESA. Take under CESA is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." It does not include "the taking of habitat alone or the impacts of the taking" (*Environmental Council of Sacramento v. City of Sacramento*, 142 Cal. App. 4th 2018 (2006).

Like FESA, CESA allows exceptions to the prohibition for take that occurs during lawful activities. Sections 2081(b) and (c) of the CFGC authorize take of endangered, threatened, or candidate species if take is incidental to otherwise lawful activity and the applicants submits an approved plan that "fully mitigates" the impact of the take.

California Natural Community Conservation Planning Act

In 1991, California's Natural Community Conservation Planning (NCCP) Act (California Fish and Game Code, Section 2800 et seq.) was enacted to implement broad-based planning that balances appropriate development

[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 CWA. 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.

and growth with conservation of wildlife and habitat. Pursuant to the NCCP Act, local, state, and federal agencies are encouraged to prepare NCCPs to provide comprehensive management and conservation of multiple species and their habitats under a single plan, rather than through preparation of numerous individual plans on a project-by-project basis. The NCCP Act is broader in its orientation and objectives than are FESA and CESA, and preparation of an NCCP is voluntary.

The primary objective of the NCCP program is to conserve plants, animals, and natural communities at the ecosystem scale while accommodating compatible and appropriate economic activity. To be approved by CDFW, an NCCP must provide for the conservation of species and protection and management of natural communities in perpetuity within the area covered by permits. Conservation is defined by the NCCP Act and the California Fish and Game Code as actions that result in the delisting of state-listed species. Thus, NCCPs must contribute to the recovery of listed species or prevent the listing of nonlisted species rather than just mitigate the effects of covered activities. This recovery standard is one of the major differences between an NCCP and an HCP prepared to satisfy FESA or CESA.

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 CFGC 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 CWA 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 CWA 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 Migratory Bird Treaty Act. 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.

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 California Native Plant Society's 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 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.

4.4.2.3 Local

The Proposed Project relates to production, treatment, storage, and transmission of water supplies, and therefore, as indicated above, these facilities are generally exempt under California Government Code Section 53091 (d) and (e) from the City of Santa Cruz and County of Santa Cruz building and zoning ordinances. However, related facilities that serve functions other than those listed above, such as the Proposed Project's Operations and Filter Building located within City limits, remain subject to the City's zoning and building requirements. This section describes local programs, policies, and regulations related to biological resources that may apply to the Proposed Project.

City of Santa Cruz General Plan 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. The nearest drainage to this portion of the Proposed Project is the San Lorenzo River, which occurs adjacent to the western outlet of the

existing underground storm drain line from the GHWTP down to the river in the utility corridor portion of the primary project site. The Creeks Plan does not identify any riparian corridors or setbacks associated within 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 the following criteria and standards for the circumstances under which a heritage tree may be removed:

- The heritage tree or shrub has, or is likely to have, an adverse effect upon the structural integrity of a building, utility or public or private right of way; Or
- The physical condition or health of the tree or shrub, such as disease or infestation, warrants alteration or removal; Or
- A construction project design cannot be altered to accommodate existing heritage trees or shrubs.

City regulations require replacement of approved heritage tree removals by replanting three 15-gallon or one 24-inch size specimen or the current value which shall be determined by the Director of Parks and Recreation. Alternatively, contributing to the in-lieu fee program allowed by the ordinance called the Tree Trust Fund, is also allowed. Removal would be permitted if found to be in accordance with the criteria and requirements previously outlined.

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

General Plan and Local Coastal Program

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. An update to the County's General Plan, known as the Sustainability Policy and Regulatory Update or Sustainability Update (County of Santa Cruz 2022), was approved by the County Board of Supervisors in December 2022 and is pending final certification by the California Coastal Commission. In the Sustainability Update, the existing Conservation and Open Space Element is proposed to be renamed as the Agriculture, Natural Resources + Conservation (ARC) Element and has been reorganized. The proposed amendments generally retain existing policies related to biological resources protection. Proposed changes include: addition of new policies and implementation strategies

supporting implementation of the County's 2013 Steelhead and Coho Salmon Conservation Strategy with priority actions addressing streamflow, habitat complexity, sediment reduction, and migration passage; stream wood retention; and fuel management to reduce threat and potential severity of wildfires while protecting sensitive habitats; as well as other updated resource management regulations consistent with current state law and practice. Given that the Sustainability Update will not be in effect until certified by the Coastal Commission, key policies related to biological resources are based on the existing General Plan and LCP; however, the key changes associated with the Sustainability Update are also provided.

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 5.2.10 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. Under the Sustainability Update these are now Policies 3.3.1 through 3.3.11, with a new policy 3.3.7 added to promote the retention of large woody material in County streams to provide multiple benefits to riparian and aquatic habitats, as described previously.

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. Under the Sustainability Update these are now Policies 3.1.1 through 3.1.13, with a new policy 3.1.12 added to reflect the implementation of policies and programs identified in the 2013 Steelhead and Coho Salmon Conservation Strategy, as described previously.

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 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.

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.

4.4.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of the Proposed Project on 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 is also identified.

4.4.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project on 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 four 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.

4.4.3.2 Analytical Methods

Potential impacts to biological resources were identified based on the results of the literature review and field surveys summarized in Appendix D and the known or potential location of such resources relative to the Proposed Project. Additional information on how impacts were analyzed is provided below.

Construction

The impact analysis presented below focuses on temporary construction-related impacts of the Proposed Project. Most work would be confined to the existing footprint of the GHWTP and associated infrastructure and would not construct new structures in currently undeveloped areas. Upon completion of construction, work areas would be revegetated and/or restored, and disturbed roadways would be repaved in accordance with County or City requirements, as relevant.

Operations and Maintenance

Post-construction operations and maintenance activities at the upgraded GHWTP would be similar to existing activities. These operation and maintenance activities include monitoring and controlling the GHWTP flow, chemical feed systems, filtration process, lamella clarifiers, and equipment functions including monitoring of SCADA system and alarms; testing water samples; filter backwashing practices; sedimentation basin sludge removal; managing and handling chemical deliveries; maintaining equipment; and maintaining the grounds. None of these activities would require new ground disturbance outside the GHWTP parcel and no new impacts are expected.

The Proposed Project may install new exterior safety lighting on the new tanks and along pathways between structures, and along access roads. No new lighting would be introduced along the site boundaries adjacent to existing natural areas comprised of oak woodland. Artificial lighting at night (ALAN) has been documented to affect the behavior or physiology of many wildlife species (Longcore and Rich 2004, Gaston et al. 2013), which can translate to reduced survival and reproduction (Dominoni et al. 2020). Artificial lighting can impact wildlife by interfering with circadian rhythms, disrupting foraging activity and movement patterns, interfering with bird navigation, or singing, and altering the development of eggs, larvae, or juveniles. As mentioned in Section 4.2, Aesthetics, however, the Proposed Project would not increase light trespass into adjacent natural areas and all new lights would be directed downward and/or shielded luminaires with low color temperatures that are less disruptive to wildlife (International Dark Sky Association 2023; Longcore 2018). Additionally, the Proposed Project would be required to comply with LEHCP measure 5 related to outdoor lighting (see Application of Standard Construction Practices and LEHCP Measures below). Any wildlife currently using woodland habitat adjacent to the site at night will have adapted to existing artificial light levels and the Proposed Project would not substantially increase these levels, nor would it add new lighting that would penetrate adjacent habitat.

Operation of an upgraded GHWTP was accounted for in the modeling of fisheries effects reported on in the Santa Cruz Water Rights Project EIR (City of Santa Cruz 2021b), as these upgrades would be a component of the future conditions that would exist with the Santa Cruz Water Rights Project. The results of fisheries modeling conducted for the Santa Cruz Water Rights Project EIR is reported on in the cumulative impact analysis in this section (see Impact BIO-6).

Application of Standard Construction Practices and LEHCP Measures

Standard Construction Practices

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts to biological resources. Standard construction practices #1 (erosion control), #2 (restoration), #9 (vegetation protection [riparian]), #10 (in-channel erosion and sedimentation control), #11 (in-channel fish species protection), #14 (in-channel restoration), and #19 (preconstruction nesting bird surveys) apply to the Proposed Project. Where applicable, these practices and their effectiveness in avoiding or minimizing impacts on biological resources are described in Section 4.4.3.3, Project Impact Analysis.

LEHCP Minimization and Mitigation Measures

The City's LEHCP covers incidental take of MHJB, Zayante band-winged grasshopper, and Ben Lomond spineflower at the GHWTP and also provides for the protection of Zayante sandhills and Maritime Coast Range Ponderosa Pine Forest communities. As described in Section 3.4.4.5, HCP Minimization and Mitigation Measures, seven of the measures from the LEHCP are incorporated into the Proposed Project:

- **Measure 1:** Locate Project Activities on and Adjacent to Current Development
- **Measure 2:** Delineate Boundaries of the Impact Area
- **Measure 3:** Cover Exposed Soils
- **Measure 4:** Dust Control
- **Measure 5:** New Outdoor Lighting
- **Measure 6:** Landscaping Elements That Degrade MHJB Habitat
- **Measure 7:** Revegetate Temporary Habitat Loss with Native Sandhills Plants

These measures would avoid or minimize impacts on the above species and their habitat on the primary project site. Where applicable, these measures and their effectiveness in avoiding or minimizing impacts on biological resources are described in Section 4.4.3.3, Impact Analysis.

Impact Evaluation Approach

Impacts are evaluated with respect to the thresholds of significance described above. Both direct and indirect impacts are considered, as follows:

- **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 EIR, direct impacts, whether permanent or temporary, refer to areas within the project site where vegetation clearing, grubbing, or excavation removes biological resources.

- **Indirect impacts** are reasonably foreseeable effects caused by the Proposed Project but that occur at a different time or place. Indirect impacts may include short-term, temporary impacts on biological resources outside the project site during construction (i.e., occur at a different place), or long-term, permanent impacts on biological resources inside or outside the project site after project completion (i.e., occur at a different time). Temporary indirect impacts during construction may include increased dust, noise, and human activity that disrupts normal wildlife behavior, and construction-related soil erosion and runoff.

If adverse environmental impacts would occur after consideration of the City's standard construction practices and LEHCP measures described in Sections 3.4.4.4 and 3.4.4.5, respectively, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant.

4.4.3.3 Project Impact Analysis

Areas of No Impact

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

- **Interfere Substantially with Fish or Wildlife Movement or Established Wildlife Corridors (Significance Threshold D).** Wooded portions of the BSA have value as a habitat linkage between areas of adjacent forest habitats. The San Lorenzo River is a regionally significant drainage that flows along the western portion of the BSA. This river corridor is used by common and special-status wildlife species as cover and foraging habitat, and to move between adjacent similar habitats. However, there are no federally or state-designated regionally important wildlife corridors that overlap the BSA. Construction activities could temporarily disrupt local wildlife movement but would not create any new movement barriers to wildlife. Wildlife that currently move through the BSA or along the San Lorenzo River would continue to do so after construction is completed. Therefore, the Proposed Project would not interfere substantially with fish or wildlife movement or established wildlife corridors and there would be no impact.
- **Conflict with Adopted Policies or Regulations (Significance Threshold E).** To accommodate new and upgraded facilities at the GHWTP, the Proposed Project could remove trees protected under Chapter 9.56 of the City's Municipal Code (Heritage Tree Ordinance), which is not part of the building or zoning ordinances and therefore the Proposed Project is not exempt from these requirements under California Government Code Section 53091 (d) and (e). Of the trees to be removed, up to 45 trees may be heritage trees under Chapter 9.56 of the City Municipal Code, which defines heritage trees by size, historical significance, and/or horticultural significance. City regulations require replacement of approved heritage tree removals by replanting 3, 15-gallon or one 24-inch box size specimen or the current value, or by contributing to the in-lieu fee program allowed by the ordinance called the Tree Trust Fund. Removal would be permitted by the City under a Heritage Tree & Street Tree Permit if found to be in accordance with the ordinance criteria, which has provisions for construction projects (see Chapter 3, Project Description). As removal would be conducted under a City permit, the Proposed Project would not conflict with the Chapter 9.56 of the City Municipal Code. The project site is located outside of the coastal zone and would not be subject to local policies and regulations set forth in the County or City LCPs. Therefore, the Proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as tree preservation ordinances, and there would be no impact.
- **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 HCP, NCCP, or other approved local, regional, or state habitat conservation plan. There are no Natural Community Conservation

Plans in the region. As previously indicated, two HCPs have been adopted and approved by the USFWS within the BSA: the City's OMHCP and the City's GHWTP LEHCP. The Proposed Project has been designed to be consistent with the conservation strategies and objectives of the OMHCP and is a covered activity under the LEHCP. Therefore, the Proposed Project would not conflict with either Habitat Conservation Plan and there would be no impact.

- **Threaten to Eliminate a Plant or Animal Community (Significance Threshold I).** The Proposed Project would not threaten to eliminate a plant or animal community. The Proposed Project would involve the removal of vegetation that could impact individual plants and/or animals, but none of the Proposed Project components, either individually or collectively, would cause the elimination of entire plant or animal communities. Therefore, the Proposed Project would not threaten to eliminate a plant or animal community and there would be no impact.

Project Impacts

Impact BIO-1	Special-Status Species (Significance Thresholds A and J). The Proposed Project would have no impact on special-status plants but could have a substantial adverse effect on some special-status wildlife species during construction. ***(Potentially Significant)***

Special-Status Plants

Six special-status plant species have moderate potential to occur in the BSA (Table 4.4-2) but none have been observed in the project site to date nor were they detected during focused rare plant surveys of the primary project site and Ocean Street Extension staging area conducted by McGraw (2021). The Mt. Hermon Road staging area and the alternate sanitary sewer replacement area are not expected to support special-status plants because of their disturbed condition. Therefore, the Proposed Project would have no impact on special-status plant species.

Steelhead and Pacific Lamprey

Central California coast steelhead (*Oncorhynchus mykiss irideus*) (federally threatened) and Pacific lamprey (*Entosphenus tridentatus*) (California Species of Special Concern) are known to occur in the San Lorenzo River at the western edge of the BSA for the primary project site and Ocean Steet Extension staging area. Potential replacement or rehabilitation of the existing storm drain line in the utility corridor at the primary project site is not expected to have a substantial adverse effect on these species given the limited amount of habitat that would be affected compared to the extent of habitat in the San Lorenzo River watershed and given the implementation of City standard construction practices as part of the Proposed Project. These standard construction practices would avoid activities in wetted channels and limit work to the low-flow season (June to October) if possible, reducing the likelihood of steelhead and Pacific lamprey presence in the primary project site when work is conducted. If work within the wetted channel cannot be avoided, the City would also implement standard construction practices to avoid injury or mortality of steelhead and/or Pacific lamprey individuals potentially migrating through the site. These standard construction practices, which are described in Section 3.4.4.4, are provided below:

- **Standard Construction Practice #10 (In-Channel Erosion and Sedimentation Control).** Implement streambed and bank protection measures for construction activities that are in or adjacent to streams and drainages. These measures may include:
  a. Avoid activities in any active flowing channels when possible.
  b. Time work during the low flow season (June – October) when possible, to avoid work in a wetted channel.

c. Utilize equipment or methods that do not require access in the channel.
d. If work within a wetted channel cannot be avoided, isolate and temporarily bypass flowing water around work area before beginning work.
e. Select appropriate equipment to minimize disturbances such as tracked or wheeled vehicles depending on site conditions.
f. Use "floating" platforms to distribute the weight of heavy equipment during mobilization in saturated soils.

- **Standard Construction Practice #11 (In-Channel Fish Species Protection).** Decontaminate tools and equipment prior to entering waterways.
- **Standard Construction Practice #12 (In-Channel Dewatering Measures).** Implement dewatering measures for projects that cannot avoid working in a flowing stream. Measures may include:
  a. Isolate the work area from the stream by diverting the entire streamflow around or through the work area by a pipe or open channel.
  b. The work area shall remain isolated from flowing water until any necessary erosion protection is in place.
  c. Where feasible, techniques shall be used to allow stream flow by gravity.
  d. All diversions shall maintain ambient flows.
  e. All water shall be discharged in a non-erosive manner using energy dissipators such as on:
     i. Gravel or vegetated bars.
     ii. Haybales, plastic, concrete.
     iii. In storm drains when equipped with filtering devices.
  f. All discharged water below the work area shall not be diminished or degraded by the diversion.
  g. Dirt, dust, or potential discharge material in the work area will be contained and prevented from entering the flowing channel.
  h. Removal of all foreign materials and temporary diversion structures such as, temporary fills, access ramps, diversion structures, or coffer dams shall be removed:
     i. When the work is complete.
     ii. As soon as reasonably possible, but no more than 72 hours after work is complete.
  i. Normal flows shall be restored to the affected stream as soon as is feasible or safe after completion.
  j. If water must be pumped around the work area, as gravity flow is not feasible:
     i. Pumps and hoses shall be screened to prevent vertebrate intake.
     ii. Sumps or basins may be used where appropriate to collect water (e.g., in channel with low flows).
  k. If a bypass diversion will be open channel design, the berm confining the channel may be constructed of material from the channel.
  l. Suitable site-specific conditions for a coffer dam installation up and downstream include:
     i. Proximity to the construction zone.
     ii. Type of construction activities to be conducted.
  m. If coffer dams installation is determined to be suitable for the site, construction shall be adequate to prevent seepage into or from the work area to the maximum extent feasible.
- **Standard Construction Practice #13 (In-Channel Species Capture and Relocation).** Implement aquatic species capture and relocation during temporary water diversion to the extent feasible to minimize the potential for killing or harming native aquatic vertebrates in the work area. If the safety of the biologist

conducting the capture may be compromised or if the equipment or gear is not reasonably effective for the operation, relocation is not required. Measures may include:

a. Work area may be isolated using fine mesh or block nets.
b. Methods of removal will be determined based on the site conditions but may include electrofishing, dipnet, or seine.
c. Relocation shall be done by a qualified biologist.
d. Relocation shall be located in a nearby suitable habitat.
e. Handling and holding time will be minimized to the maximum extent practicable.
f. As the work site is de-watered, the remaining pools will be inspected for presence of aquatic species suitable for relocation.

Additional measures for protection of these species may be required as part of regulatory approvals for work within the San Lorenzo River channel (e.g., Lake or Streambed Alteration Agreement from CDFW). Therefore, with the implementation of these standard construction practices and other regulatory permit conditions, the Proposed Project would not constitute a substantial adverse effect on steelhead or Pacific lamprey and the construction impact would be less than significant.

Once the storm drain line is replaced or rehabilitated, operational impacts of the Proposed Project would be the same as under existing conditions, as the storm drain line is currently in place and functioning as it would under Proposed Project conditions. Therefore, there would be no operational impacts on steelhead or Pacific lamprey.

Mount Hermon June beetle

Mount Hermon June beetle (MHJB) has high potential to occur on the primary project site, specifically on the GHWTP parcel, where it is historically known to occur within an approximately 0.8-acre patch of ponderosa pine forest near the entrance to the GHWTP. Surveys in 2004 and 2008 detected the species immediately south of the water tank to the paved service road, and subsequent monitoring indicated that a very small population persists at the site (City of Santa Cruz 2013). The Proposed Project is a Covered Activity under the City's GHWTP LEHCP, which would implement the Minimization and Mitigation Measures listed in Section 4.4.3.2, Analytical Methods, to avoid impacts on this species. Measure 1 (Locate Project Activities on and Adjacent to Current Development) has already been implemented because Proposed Project activities within MHJB habitat are contained within the existing GHWTP facility. Measures 2 (Delineate Boundaries of the Impact Area) and 3 (Cover Exposed Soils) would avoid mortality of individual MHJB by alerting workers not to enter habitat outside the primary project site and covering exposed soils between 7:00 PM and 7:00 AM during the MHJB flight season (May 15 to August 15) to prevent adults from burrowing into the soil, where they would be at risk of being injured or killed from soil disturbance. Measure 5 (New Outdoor Lighting) would require that all new outdoor lighting use bulbs certified not to attract nocturnal insects, including MHJB. Measure 6 (Landscaping Elements that Degrade MHJB Habitat) would prohibit the use of turf grass, dense ground covers, weed matting, aggregate, and mulch in any new landscaping to prevent habitat degradation. Measure 7 (Revegetate Temporary Habitat Loss with Native Sandhills Plants) would require that any temporarily disturbed areas on the primary project site that will not support any new structures or hardscape be revegetated with native sandhills plants that would provide habitat for any MHJB that may recolonize such areas after construction. Implementation of these measures would avoid or minimize adverse construction and operational effects on MHJB and its habitat and therefore the Proposed Project's impact on this resource would be less than significant.

Santa Cruz Black Salamander, California Giant Salamander, and Western Pond Turtle

Santa Cruz black salamander and California giant salamander have moderate potential to occur in riparian vegetation along the San Lorenzo River at the western edge of the BSA for the primary project site and Ocean Steet Extension staging area and western pond turtle has moderate potential to occur in and adjacent to the river. Potential replacement or rehabilitation of the storm drain line next to the San Lorenzo at the western edge of the utility corridor could injure or kill individuals of these species if present in affected habitat at the time of construction. This would be a substantial adverse effect because any mortality of individuals or habitat loss could further contribute to population declines of these species. Standard construction practices identified above for steelhead and lamprey would reduce but not avoid such effects. Therefore, the construction impact of the Proposed Project would be potentially significant.

Implementation of Mitigation Measure (MM) BIO-1 (Survey and Monitoring), MM BIO-2 (Biological Construction Monitoring), and MM BIO-3 (Species Relocation) would avoid substantial adverse construction effects on special-status amphibians and reptiles by conducting a preconstruction survey, installing wildlife exclusion fencing along the boundary of the work area containing suitable habitat to prevent individuals from entering the work area, monitoring of vegetation removal and initial ground disturbance and the integrity of the exclusion fencing, and relocating any individuals within the construction area to nearby habitat that has equivalent value to support the species. Therefore, implementation of the above mitigation measures would reduce the construction impact on special-status amphibians and reptiles to less than significant.

Once the storm drain line is replaced or rehabilitated, operational impacts of the Proposed Project would be the same as under existing conditions, as the storm drain line is currently in place and functioning as it would under Proposed Project conditions. Therefore, there would be no operational impacts to special-status amphibians and reptiles.

White-tailed Kite

White-tailed kite, a California fully protected species, has high potential to nest in trees within or adjacent to the project site. If conducted during the nesting season (February 1 to August 31), tree removals or trimming could directly impact any white-tailed kites nesting in affected trees. Increased human activity and construction-generated noise and vibration near active nests could cause adults to abandon eggs or recently hatched young if they perceive such disturbances as a threat. The City would implement a standard construction practice to avoid impacts to nesting birds, including white-tailed kite. This standard construction practice from Section 3.4.4.4 is provided below:

- **Standard Construction Practice #19 (Preconstruction Nesting Bird Surveys).** Vegetation removal activities shall be conducted outside the bird nesting season (February 1 through August 31) as possible to avoid direct impacts to nesting birds. For construction and vegetation removal activities occurring during the nesting season, a preconstruction survey of the work areas for active bird nests shall be conducted by a qualified wildlife biologist no more than seven days prior to the start of vegetation removal or construction activities. Once construction has started, if there is a break in activities that exceeds seven days, another survey shall be conducted. If at any time during construction or vegetation removal activities an active bird nest is found, the nest shall be flagged and the biologist shall determine an appropriate no-disturbance buffer based on the species' sensitivity to disturbance. The buffer shall be avoided until the nest is vacated or the young 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. If construction and vegetation removal activities do occur during the nesting season, the City may consider the use of decoys (e.g., owls

or raptors) or noise makers at the beginning of the nesting season to limit or avoid nesting activities in proximity to construction sites.

Therefore, with the implementation of this standard construction practice, the Proposed Project would not constitute a substantial adverse effect on white-tailed kite and the construction impact would be less than significant.

Once all proposed facilities are constructed, operation and maintenance impacts of the Proposed Project would be similar to existing conditions, as described in Section 4.4.3.2, Analytical Methods. While the Proposed Project may install new exterior safety lighting at the GHWTP, it would not increase light trespass into adjacent natural areas and all new lights would be directed downward and/or shielded luminaires with low color temperatures that are less disruptive to wildlife (International Dark Sky Association 2023; Longcore 2018). Therefore, the operational impacts of the Proposed Project on white-tailed kite would less than significant.

See also Impact BIO-4 related to other nesting bird species.

San Francisco Dusky-Footed Woodrat

San Francisco dusky-footed woodrat has high potential to occur in wooded areas on the project site: several middens were observed north and south of the existing water tanks on the GHWTP parcel, and another was observed in the alternate sanitary sewer lateral replacement area. Woodrats could construct additional middens in or adjacent to the project site before construction. Construction activities could directly impact this species through destruction of occupied middens, causing injury or mortality of individual woodrats, and removal of sheltering vegetation, potentially resulting in abandonment of the midden and increased exposure to predation. This would be a substantial adverse effect because the loss of occupied middens would reduce the reproductive potential of the local population. Therefore, the construction impact of the Proposed Project would be potentially significant.

Implementation of MM BIO-4 (Surveys for San Francisco Dusky-Footed Woodrat) would avoid substantial adverse construction effects on San Francisco dusky-footed woodrat by conducting a preconstruction survey, by avoiding and protecting occupied woodrat middens with an avoidance buffer, and where avoidance is not possible by relocating midden materials only during the non-breeding season (October to February) so that any adults or non-dependent young can escape into adjacent habitat during the dismantling activity. Therefore, implementation of the above mitigation measure would reduce the construction impact on San Francisco dusky-footed woodrats to less than significant.

Once all proposed facilities are constructed, operation and maintenance impacts of the Proposed Project would be similar to existing conditions, as described in Section 4.4.3.2, Analytical Methods. While the Proposed Project may install new exterior safety lighting at the GHWTP, it would not increase light trespass into adjacent natural areas and all new lights would be directed downward and/or shielded luminaires with low color temperatures that are less disruptive to wildlife, as described above for white-tailed kite. Therefore, the operational impacts of the Proposed Project on San Francisco dusky-footed woodrat would less than significant.

Mitigation Measures

Implementation of the following mitigation measures would reduce the potentially significant impacts related to some special-status wildlife species to less than significant, as described above.

MM BIO-1: Special-Status Amphibian and Reptile Species Survey and Monitoring (applies only to the Utility Corridor, if stormwater improvements are implemented). 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 San Lorenzo River). The survey area shall include all suitable habitat within the work areas, plus a 50-foot buffer. Following the survey, the contractor, under the direction of a qualified biologist, shall install wildlife exclusion fencing along the boundary of the work area containing suitable habitat to prevent special-status amphibians and reptiles from entering the work area. The wildlife exclusion fencing 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. Turnarounds shall be installed at access points to direct amphibians and reptiles away from gaps in the fencing.

MM BIO-2: Biological Construction Monitoring (applies to entire project site and staging areas). A qualified biologist shall monitor vegetation removal and initial ground disturbing activities during all work hours for off-pavement work where special-status wildlife species are likely to occur. The frequency and characteristics of monitoring will be determined by the qualified biologist during the implementation of MM BIO-1 and MM BIO-4. The monitor shall check any wildlife exclusion fencing installed at the utility corridor along the San Lorenzo River and any avoidance buffers for nesting birds once a week and verify when birds have fledged if found present before construction. The biologist shall have stop-work authority in the event that a listed 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 and made available for inspection by agency personnel.

MM BIO-3: Species Relocation (applies to entire project site and staging areas). If special-status wildlife species are observed within the construction area prior to or during construction activities, the biologist shall capture and relocate such individuals out of the area affected by construction activities to nearby habitat that has equivalent value to support the species. The biologist shall identify suitable habitats as potential release sites prior to start of construction activities. If the special-status species is a federally or state-listed as threatened or endangered, the biologist shall notify the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and/or National Marine Fisheries Service, as appropriate, prior to capture and relocation to obtain approval, if not already covered by an existing incidental take permit.

MM BIO-4: Surveys for San Francisco Dusky-Footed Woodrat (applies to entire project site and staging areas). A pre-construction survey for San Francisco dusky-footed woodrat middens shall be conducted within 14 days of the start of construction. During the survey, a qualified biologist shall identify any middens in the work area and contiguous habitat within 10 feet and determine if they are active using peer-accepted methods (e.g., mimicking woodrat "tail rattle" and listening for a response). If the biologist determines that the middens are unoccupied, no further action is required. If the biologist determines that the middens are occupied or potentially occupied and that project activities could result in woodrat mortality, the following measures shall be implemented:

a. The contractor, under direction of the biologist, shall install a 10-foot-radius exclusion zone around each midden using pin flags, orange safety cones, wood lathe, or similar material in which no activity would occur until project construction is complete.

b. If middens cannot be avoided by this buffer, the contractor, under direction of the biologist, shall dismantle the middens by hand or using small machinery and move the woody materials to similar habitat outside the project footprint. The midden dismantling activities shall only occur in the early morning during the non-breeding season (October to February), however, so that any adults or non-dependent young can escape into adjacent habitat during the dismantling activity.

Impact BIO-2	Riparian Habitat or Sensitive Natural Communities (Significance Threshold B). The Proposed Project would not have a substantial adverse effect on riparian habitat or sensitive natural communities. ***(Less than Significant)***

Four sensitive natural communities occur in the BSA: black cottonwood forest and woodland, California bay forest and woodland, California sycamore woodland, and redwood forest and woodland. Black cottonwood forest and woodland is located along the San Lorenzo River at the western edge of the primary project site (within the utility corridor) and Ocean Street Extension staging area, and a small portion of California bay forest and woodland extends into the primary project site at the southwestern edge of the main GHWTP parcel in an area not proposed for development (Figure 4.4-1A). Redwood forest and woodland occurs on the main GHWTP parcel on the hill upon which the washwater storage tank is located and along the San Lorenzo River and within the utility corridor (Figure 4.4-1A). A small area of California sycamore woodland overlaps the northwestern corner of the Mt. Hermon Road staging area (Figure 4.4-1D), but no impacts are expected in this area as it is located on the periphery of the staging area boundary. Overall, trees could be trimmed or removed during construction within black cottonwood forest and woodland along the utility corridor and at the Ocean Street Extension staging area, and within redwood forest and woodland at the GHWTP parcel and along the utility corridor. In particular, approximately 22 redwood trees could be removed on the main GHWTP parcel on the hill upon which the washwater storage tank is located to accommodate the replacement and new washwater storage tanks. Additionally, tree removal along the utility corridor could occur if the existing dedicated storm drain line for the GHWTP requires replacement or rehabilitation.

Tree trimming or removal activities are not expected to have a substantial adverse effect on sensitive natural communities given the limited amount of habitat that would be affected compared to the extent of such communities in Santa Cruz County and given the implementation of City standard construction practices. Specifically, these practices would restore disturbed natural communities by replanting with native species appropriate for the site, would avoid removal of riparian overstory trees that shade the stream channel and stabilize the stream bank by marking trees not to be removed; maintain canopy, downed trees, and snags that contribute to riparian habitat value; and restore impacted areas with native species appropriate for the site. These standard construction practices, which are described in Section 3.4.4.4, are provided below:

- **Standard Construction Practice #2 (Restoration).** Implement post-construction restoration on temporarily disturbed areas such as staging, new access routes, or work areas. Post-construction restoration may include:
  a. De-compact soils if necessary.
  b. Restore disturbed natural communities by replanting native species appropriate for the site, such as from native riparian, wetland, or upland communities. Planted material may include native seed mixes, pole cuttings, and/or container stock as appropriate.
- **Standard Construction Practice #9 (Vegetation Protection [Riparian]).** Minimize impacts to riparian vegetation when working in or adjacent to an active stream channel by implementing avoidance and minimization measures. These measures may include:
  a. Avoid disturbance to and limit pruning of existing vegetation whenever possible.
  b. Minimize removal of overstory trees that provide shade to the stream channel or banks through marking trees that are not to be removed.

c. Trim vegetation using hand tools and maintain canopy, downed trees, and snags to the extent possible.
d. Limit management of vegetation that is stabilizing the stream banks to trimming and pruning.
e. Demarcate temporary access routes to limit extent of impacts.
f. Restore impacted riparian vegetation with native species appropriate for the site.

In addition to these standard construction practices, the Proposed Project would also be required to comply with the City's Heritage Tree Ordinance (see Areas of No Impact above). Therefore, the Proposed Project would not constitute a substantial adverse effect on riparian habitat or any other sensitive natural communities and the construction impact would be less than significant.

Once all proposed facilities are constructed, operation and maintenance impacts of the Proposed Project would be similar to existing conditions, as described in Section 4.4.3.2, Analytical Methods. Therefore, the operational impacts of the Proposed Project on riparian habitat or any other sensitive natural communities would less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to riparian habitat or any other sensitive natural communities, and therefore, no mitigation measures are required.

Impact BIO-3	State or Federally Protected Wetlands or Waters (Significance Threshold C). The Proposed Project could have a substantial adverse effect on state or federally protected wetlands or waters. ***(Potentially Significant)***

The San Lorenzo River is the only known state or federally protected aquatic resource in the BSA. Three additional features, a 0.02-acre seep on the GHWTP parcel (see Figure 4.4-2A), an ephemeral drainage along the south side of the primary project site, and topographic feature along the northern edge of the Ocean Street Extension staging area (see Figure 4.4-2C) are of unknown jurisdictional status. The seep and Ocean Street Extension staging area feature are outside the footprint of proposed activities and would not be directly impacted. Potential replacement or rehabilitation of the storm drain line within the utility corridor of the primary project site could result in minor impacts to the ephemeral drainage, river and/or associated riparian vegetation. Direct impacts would occur if storm drain line modifications required permanent or temporary fill within agency jurisdiction. Potential indirect impacts include increased sedimentation of downstream waters from construction-related soil erosion; altered hydrology from temporary water diversions or changes in topography; and pollution of downstream waters from inadvertent release of chemical pollutants (e.g., oils and fluids from construction equipment). Implementation of City standard construction practices would minimize such impacts. Specifically, standard construction practice #1 (Erosion Control) and #10 (In-Channel Erosion and Sedimentation Control) would prevent sedimentation of downstream waters by implementing and maintaining effective erosion and sediment controls at all times of the year and timing work during the low-flow season to avoid work in wetted channels. Standard construction practice #2 (Containment of Work Area) would avoid inadvertent release of chemical pollutants by implementing hazardous material containment measures. Standard construction practice #9 (Tree Protection [Riparian]) would avoid removal of riparian overstory trees that shade the stream channel and stabilize the stream bank by marking trees not to be removed; maintain canopy, downed trees, and snags that contribute to riparian habitat value; and restore impacted areas with native species appropriate for the site. Finally, standard construction practice #14 (In-Channel Restoration) would minimize any direct impacts on the San Lorenzo River channel by restoring the streambed and bank to their pre-project condition as closely as possible. Standard construction practice #2, #9, and #10, which

are described in Section 3.4.4.4, are provided under Impact BIO-1 and BIO-2, above. Standard construction practice #1 is provided below:

- Standard Construction Practice #1 (Erosion Control). Implement and maintain effective erosion and sediment control measures at all times of the year. Measures may include:
  a. Install silt fencing, fiber or straw wattles, and/or rice straw bales on slopes and along limits of work/ construction areas to break up and filter surface runoff.
  b. Utilize additional erosion control including native duff, jute netting, etc.
  c. Utilize additional sediment control including fencing, dams, barriers, berms, traps, and associated basins.
  d. Cover of stockpiled spoils.
  e. Install rolling dips and revegetation on temporary accessways.
  f. Physical stabilization/revegetation of disturbed or graded areas including staging areas, prioritizing the use of native species for revegetation where appropriate.
  g. Install sediment containment measures for all active and inactive stockpiles, spoil disposal sites, concrete wash sites, stabilization structures, and other debris areas, such as Visqueen plastic sheeting, fiber or straw wattles, gravel bags, and hydroseed.
  h. Locate construction storage areas outside of any stream channel, and a minimum distance of 65 feet away from any jurisdictional aquatic resource.
  i. All erosion and sediment control materials shall avoid the use of plastic mesh.
  j. Prior to forecasted and following all rain events, all erosion and sediment control devices shall be inspected for their performance and repaired or replaced immediately if they are found to be deficient.

Even with the implementation of these standard construction practices, direct permanent and temporary impacts on the San Lorenzo River associated with storm drain line modifications within the utility corridor would still be potentially significant because they would involve direct removal or filling of federally and state-protected waters.

Implementation of MM BIO-5 would avoid substantial adverse effects to federally and state-protected waters by requiring a jurisdictional delineation and development of a mitigation plan approved by the USACE, RWQCB and CDFW to compensate for impacts. Therefore, implementation of the above mitigation measure would reduce the construction impact on state or federally protected wetlands or waters to less than significant.

Once the storm drain line is replaced or rehabilitated, operational impacts of the Proposed Project to federally and state-protected waters would be the same as under existing conditions, as the storm drain line is currently in place and functioning as it would under Proposed Project conditions. Therefore, there would be no operational impacts to federally and state-protected waters.

Mitigation Measures

Implementation of the following mitigation measure would reduce the potentially significant impact related to state or federally protected wetlands or waters to less than significant, as described above.

MM BIO-5: Aquatic Resource Delineation and Mitigation (applies only to the Utility Corridor, if stormwater improvements are implemented). To clarify the extent of state and federally protected wetlands and waters regulated by the U.S. Army Corps of Engineers, Regional Water Control Board, and California Department of Fish and Wildlife within the utility corridor area along

the San Lorenzo River, a qualified aquatic resource delineator shall conduct a formal jurisdictional delineation within the impact area. The results of the delineation would be used to calculate temporary and permanent impacts for reporting to the above agencies in respective permitting applications and determine the appropriate amount of compensatory mitigation for unavoidable impacts. All jurisdictional aquatic resources not directly affected by construction activities shall be avoided and protected by establishing staking, flagging or fencing between the identified construction areas and aquatic resources to be avoided/preserved.

For unavoidable impacts to jurisdictional aquatic resources, a project-specific mitigation plan shall be developed, approved by the above agencies, 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 (in-kind mitigation at a minimum mitigation ratio of 1:1);
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 stands are not achieved.

Impact BIO-4	Native Wildlife Nursery Sites (Significance Threshold D). The Proposed Project would not impede the use of native wildlife nursery sites by removing or causing abandonment of active native bird nests. ***(Less than Significant)***

Nursery sites are locations where fish and wildlife congregate for hatching and/or raising young. For the purposes of this EIR, nursery sites are considered for native wildlife that are not designated as special-status species, which are addressed separately in Impact BIO-1. The BSA contains suitable nesting habitat for ground and tree-nesting bird species, particularly within wooded areas and undeveloped lands. If conducted during the nesting season (February 1 to August 31), tree removals or trimming could directly impact any birds nesting in affected trees and increased human disturbance and construction-generated noise and vibration could cause abandonment of nests by adults. The City would implement standard construction practice #19 (preconstruction nesting bird surveys), as described in Impact BIO-1, to avoid construction impacts on nesting birds. Therefore, the construction impact of the Proposed Project on wildlife nursery sites (i.e., native bird nests) would be less than significant.

Once all proposed facilities are constructed, operation and maintenance impacts of the Proposed Project would be similar to existing conditions, as described in Section 4.4.3.2, Analytical Methods. While the Proposed Project may install new exterior safety lighting at the GHWTP, it would not increase light trespass into adjacent natural areas and all new lights would be directed downward and/or shielded luminaires with low color temperatures that are less disruptive to wildlife (International Dark Sky Association 2023; Longcore 2018). Therefore, the operational impacts of the Proposed Project on wildlife nursery sites would less than significant.

Mitigation Measures

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

Impact BIO-5	Fish or Wildlife Species Habitat or Population Levels (Significance Thresholds G and H). The Proposed Project would not substantially reduce fish or wildlife species habitat or cause a fish or wildlife population to drop below self-sustaining levels. *(Less than Significant)*

The Proposed Project does not have the potential to substantially reduce the habitat of fish or wildlife species or cause a fish or wildlife population to drop below self-sustaining levels. As described in Impact BIO-1, during construction, potential replacement or rehabilitation of the existing storm drain line in the utility corridor is not expected to have a substantial adverse effect on fish habitat given the limited amount of habitat that would be affected compared to the extent of habitat in the San Lorenzo River watershed and given the implementation of City standard construction practices as part of the Proposed Project.

The Proposed Project does have the potential to impact other aquatic or terrestrial wildlife species, including special-status species (see Impact BIO-1), because of ground disturbance and tree removal and trimming during construction. However, the extent of anticipated ground disturbance is relatively small and would largely be contained within the footprint of the existing GHWTP and associated infrastructure. Temporary impact areas would also be restored to their pre-project condition with the implementation of previously identified City standard construction practices. Therefore, the Proposed Project would not substantially reduce the habitat of a fish or wildlife species or cause a fish or wildlife population to drop below self-sustaining levels and the construction impact would be less than significant.

Once all proposed facilities are constructed, operation and maintenance impacts of the Proposed Project would be similar to existing conditions, as described in Section 4.4.3.2, Analytical Methods. The Proposed 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. While the Proposed Project may install new exterior safety lighting at the GHWTP, it would not increase light trespass into adjacent natural areas and all new lights would be directed downward and/or shielded luminaires with low color temperatures that are less disruptive to wildlife (International Dark Sky Association 2023; Longcore 2018). Therefore, the operational impacts of the Proposed Project on fish and wildlife species habitat would less than significant.

Mitigation Measures

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

4.4.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative biological resources impacts from 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 where relevant to this topic. The geographic area of analysis for cumulative impacts to biological resources is the San Lorenzo River watershed for operational impacts and the project vicinity for construction

impacts. Therefore, only cumulative projects in these geographic areas are considered in the analysis herein, as described below.

The Proposed Project would not contribute to cumulative impacts related to interference with fish or wildlife movement or established wildlife corridors (Significance Threshold D); conflicts with adopted policies or regulations (Significance Threshold E); conflicts with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (Significance Threshold F); or threatening to eliminate a plant or animal community (Significance Threshold I) because it would have no impact related to these thresholds, as described above. Therefore, these significance thresholds are not further evaluated.

Impact BIO-6:	Cumulative Biological Resources Impacts (Significance Thresholds A, B, C, G, H, and J). The Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact related to biological resources, but the Proposed Project's contribution to this impact would not be cumulatively considerable. ***(Less than Significant)***

Construction Impacts

All of the capital investment projects, other infrastructure projects, and residential, commercial, or mixed-use projects identified in Table 4.0-1 within or near the biological study area could result in localized construction impacts to special-status biological resources. A number of these projects have already been evaluated in CEQA documents including the Newell Creek Dam Inlet/Outlet Replacement Project EIR (City of Santa Cruz 2019a), the GHWTP Concrete Tanks Project (City of Santa Cruz 2019b), the Newell Creek Pipeline Improvement Project EIR (City of Santa Cruz 2022), and the Santa Cruz Water Rights Project (City of Santa Cruz 2021b). These EIRs indicate that project and cumulative impacts related to special-status biological resources would be either less than significant or less than significant with identified mitigation measures.

The remaining infrastructure projects and residential, commercial, or mixed-use development projects in Table 4.0-1 have not yet been evaluated under CEQA or the CEQA process is underway. These cumulative projects could impact special-status biological resources if they involve converting natural land cover for human use (e.g., conversion of grassland to structures), temporary ground disturbance in sensitive vegetation communities or species habitat, or removal of vegetation potentially supporting special-status species (e.g., nesting birds). These projects should be required to assess impacts to biological resources as part of the discretionary approval process and should incorporate all feasible mitigation measures to reduce impacts. However, it is possible that these cumulative projects could have significant cumulative impacts on biological resources due to construction if these cumulative projects are not properly mitigated. The Proposed Project would result in potentially significant construction-related impacts to special-status wildlife and state and federally protected waters, but these impacts would be reduced to less than significant with the implementation MM BIO-1 through MM BIO-5, as described in Impacts BIO-1 through BIO-4. Therefore, with the implementation of these mitigation measures, the Proposed Project's contribution to the cumulative construction impact would not be cumulatively considerable. As such, the cumulative construction impact of the Proposed Project would be less than significant related special-status biological resources.

Operational Impacts

Within the San Lorenzo River watershed, the City Water Department Capital Investment Program includes replacement of the entire Newell Creek Pipeline (NCP), which runs from Loch Lomond Reservoir to the GHWTP. Another City project is the Santa Cruz Water Rights Project, which includes a number of water rights modifications

along with infrastructure improvements that could be implemented as a result of the water rights modifications. The modeling of hydrological and fisheries impacts provided in the Santa Cruz Water Rights EIR included the NCP replacement and proposed upgrades to the GHWTP being considered as part of the Proposed Project. These two projects were included in that modeling as they are a component of the future conditions that would exist with the Santa Cruz Water Rights Project. The Santa Cruz Water Rights EIR concluded that the operational impacts on special-status species, riparian or sensitive natural communities, state or federally protected wetlands or waters, and other biological resources impacts would be less than significant (City of Santa Cruz 2021b).

The only other known cumulative project that could affect conditions in the San Lorenzo River due to long-term operations is the San Lorenzo Valley Water District (SLVWD) Conjunctive Use Plan for the San Lorenzo River Watershed (Conjunctive Use Plan). The Conjunctive Use Plan to increase stream baseflow for fish and increase reliability of surface and ground water supplies for the SLVWD would include water rights changes, use of existing interties to move water between service areas, and use of SLVWD's Loch Lomond Reservoir contractual rights for specified quantities of reservoir water. Environmental impacts of the Conjunctive Use Plan are not currently known, as SLVWD is in the process of preparing an EIR for the project. It is possible that the EIR will find that the Conjunctive Use Plan will have significant effects on aquatic resources, including cumulatively considerable contributions to significant cumulative impacts. It is also possible that, as part of the EIR process, SLVWD will find ways to refine the Conjunctive Use Plan, or to formulate mitigation measures, that would avoid any such significant effects. Regardless, the Proposed Project would not result in operational impacts that are cumulatively considerable, and therefore the operational impact of the Proposed Project would be less than significant.

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4.5 Cultural Resources and Tribal Cultural Resources

This section describes the existing cultural resources (unique archaeological resources and historic resources) and tribal cultural resources conditions of the project site and vicinity. This includes description of the project site in order to determine the presence or absence of historic properties and potential effects upon those properties. It also identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on the Cultural Resources Inventory and Evaluation Report (CRIER) (Dudek 2022) for the Proposed Project, prepared to support this environmental impact report (EIR). The results of the CRIER are summarized in this section and the entire report is 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. 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 18 and provided recommendations for cultural resource assessment for the Proposed Project.

4.5.1 Definitions

Under the sample Initial Study Checklist found in Appendix G of the California Environmental Quality Act (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 4.5.3, Regulatory Framework.

4.5.2 Existing Conditions

The Proposed Project would be implemented on the primary project site and associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2, and Figure 3-3, in Chapter 3, Project Description.

Information on cultural resources occurring or potentially occurring in the project site was obtained through cultural resource records searches, archival research, pedestrian surveys of the project site, historical significance evaluations obtained from the City, and from correspondence with Native American tribes and other interested parties. The information is summarized below and described in detail in Appendix E.

4.5.2.1 Cultural Context

The following overview is summarized from the CREIR prepared for the Proposed Project (see Appendix E for complete description and references) unless otherwise cited.

Prehistoric Context

Prior to European contact, the project site was within the territory that was occupied by people of the Costanoan or Ohlone language family. 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 that span into six different periods. Researchers distinguish these periods by 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. 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 appears with more frequency in the Millingstone Period. Sites are often associated with shellfish remains and small mammal bone that suggests 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 and may reflect a decline in regional population.

Late Period (AD 1250 to 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 (1769 to 1822)

The first European exploration of the Central Coast was led by Sebastián Vizcaíno, who, in 1602, was sent by the Spanish government to map the California coastline. It was Vizcaíno who named the area "Puerto de Monterey" after Conde de Monterey, the Viceroy of New Spain. The Gaspar de Portolá expedition traveled through the region in 1769 and returned again in 1770 successfully locating the Monterey Bay. However, it would be another 21 years before the Franciscan order would establish Mission Santa Cruz in 1791, as the twelfth mission in the California Mission system. 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 in 1797 on the eastern part of Santa Cruz; the population dwindled by 1817 as people followed new opportunities.

Mexican Period (1822 to 1848)

Mexico gained independence from Spain in 1821 and, between 1834 and 1839, the Mexican government secularized the mission lands, releasing it back to the Native Americans from control of the mission system. Despite this liberal declaration, Indians throughout the republic continued to be treated as slaves. A smallpox epidemic in 1838, reoccurring bouts of syphilis, and likely other factors caused a massive decline in the Native American population and few Native American recipients remained to receive it.[1] 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. The scarcity of water in the future City of Santa Cruz intensified towards the end of the Mexican Period with assistance from a formal decree by the Santa Cruz Alcalde, Don Manuel Rodriguez. In 1844, Rodriguez transferred the rights to the water carried by the 1792 aqueduct to the limited control of the mission and eight adjacent grant-holders. After this point, the growing population in the outlying areas of Santa Cruz became exclusively reliant on water taken from shallow wells and surface sources that were subject to seasonal surge and drought cycles, such as the San Lorenzo River.

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 1848 led to an influx of people seeking gold in the rural counties of California. California became a state in 1850 and Santa Cruz County was designated as one of the original 27 counties in California. As the County moved into the 1900s, agriculture, extractive industries such as lumber and mining, 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. 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 the County's residents.

4.5.2.2 Water Management in North Santa Cruz County

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

The California Gold Rush of 1848 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 California.

[1] Mexican forced labor and violence at the hands of the slave hunting parties account for a significant amount of the population decline suffered by California Indians (NAHC 2023).

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. 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.

4.5.2.3 Development of Water Infrastructure in the City of Santa Cruz

The San Lorenzo River and the many creeks that wind through the greater Santa Cruz County area have historically been subject to seasonal droughts and floods. Coupled with the many upstream diversions and industrial uses of these waterways by settlers and purveyors in the Santa Cruz Mountains, water shortages are present in the earliest records of the County. By the 1860s, acute cyclical shortages and pollution prompted the development of private for-profit water systems in the City. 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 to consider why these were not being put to use for the benefit of drinking water. The following sections detail specific projects and milestones related to the development of water management systems in the City.

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 the City. 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. By 1876, the system was 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 City incorporation of by two 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 composes 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 (then called Cojo 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.

Public Development (1890 to 1917)

During the 1880s, the rising price of the private, fee-based water systems prompted the City to explore its own, City-owned public option that would grant its citizens unlimited free water. In August of 1886, the Santa Cruz Water Company along with all of its appurtenances was purchased by the City through the sale of bonds from the Bank of Santa Cruz and the Anglo-Californian Bank. Hihn bitterly opposed the issuance of the bonds and contested their legality in court. The matter reached the Supreme Court and the election in favor of the bonds was declared invalid in 1887. By this time however, the City had already operated the system for over a year when it was re-conveyed to private owners in 1887. The City voted again in March 1888 to put up the bonds necessary to purchase the system from the private owners. While the City was in the process of securing the bonds for the purchase, the system was covertly sold to Hihn in a private, backroom deal before the City could obtain legal ownership. Hihn quickly consolidated the Santa Cruz Water Company system with his own works and effectively severed the opportunity the City had of acquiring an established water works system.

The City revised its approach, and by July 1888, the Common Council had secured nearly all of the water rights to the Laguna Creek. The creek was capable of supplying 1.4 million gallons towards a City-owned water works. Plans for the construction of the first City-owned water works, supplied through a new pipeline by the waters of Laguna Creek, with reserve storage in a new City reservoir were finally in motion. 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).

Fredrick A. Hihn passed away in 1913 and by 1916 the City had acquired the Santa Cruz Water Company system and assumed full legal ownership of all components that included rights to water being drawn from Branciforte Creek, Carbonera Creek, Majors Creek, and the San Lorenzo River. 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.

4.5.2.4 History of the Graham Hill Water Treatment Plant

The GHWTP is a water filtration and treatment facility designed by Brown and Caldwell Civil and Chemical Consulting Engineers that was completed in 1959. It was planned during the same period as the Newell Creek Dam and also funded by the same water revenue bonds that helped to build the dam. The GHWTP was upgraded and enhanced in 1987 following a push for major upgrades throughout the municipal system beginning in 1984.

The following text provides a summary of subsequent modifications to the GHWTP following its initial completion in 1959. The following list of modifications was quoted in its entirety from the DPR 523 form set prepared in 2019 by Carey & Co. for the GHWTP:

The Graham Hill Water Treatment Plant was constructed in 1959 as a conventional treatment plant with a capacity of 12 million gallons per day. It was "expanded in the late 1960s, modified in the mid-1980s, and updated again in the 1990s, 2000s, and 2010s." These updates include:

- 1959 Brown & Caldwell – Original Treatment Plant Design
- 1968 Brown & Caldwell – Additions
- 198[5] CH2M Hill – Modernization
- 1987 Dewante & Stowell – Water Quality Control Lab addition
- 200[7] Mesiti + Miller Engineering – GHWTP Slide Repairs
- 2009 Bowman & Williams [Water Quality Lab Upgrade/Expansion]
- 2011 CDM – Electrical Improvements Project
- 2014 Kennedy/Jenks – Filter Rehab and Upgrades

The following list of additional modifications was compiled from a review of as-built plans and specifications provided by the City:

- 1960 Simpson & Stratta – Structural Revisions Operations Building Roof
- 1960 Brown & Caldwell – Entrance Gate and Wall
- 1965 Brown & Caldwell – Modifications for graphics panel and motor control center, installation of new transistorized tone telemetering equipment, electrical modifications for water supply and distribution systems control
- 1979 SCWD – Installation of 2 "ALUM' Storage Tanks
- 1983 SCWD – Sedimentation Tank Modernizations
- 1985 CH2M Hill – Emergency Filter Repair
- 1988 SCWD –Water Quality Lab Stairway
- 1998 CDM – Washwater Reclamation and Sedimentation Improvements
- 2018 Kennedy/Jenks – Tube Settler Replacement
- 2019 Kennedy/Jenks – Flocculator Replacement
- 2020 West Yost Associates – Concrete Tanks Replacement[2]

4.5.2.5 Archaeological Resources and Conditions

The following section summarizes archaeological resources and conditions on the project site, as described in Section 4.5.2, Existing Conditions. The results and findings are summarized below.

CHRIS Records Search

A cultural records search for the project site and 0.25-mile buffer was conducted by Dudek archaeologists on April 28, 2021, at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University (NWIC File No. 20-2169). The records search covered previously recorded resources and technical reports and reviewed archaeological and non-archaeological resource records and reports on file at NWIC, the National Register of Historic Places (NRHP), the California Register of Historical

[2] This project is still under construction; as such, the design plans are referenced and not the as-built plans.

Resources (CRHR), California Inventory of Historic Resources, historical maps, and local inventories. A summary of these findings is presented below, and a more detailed summary is provided in Appendix E. See Section 4.5.3, Regulatory Framework, for information about these historic registers.

Previous Technical Studies

The records search results indicated seven previously conducted studies with coverage intersecting the project site and 32 additional studies with coverage outside the project site but within a 0.25-mile radius of the site (Appendix E). The seven studies within the project site are described below.

S-4005

Chavez (1979) conducted a cultural resources assessment for a wastewater project that included survey of approximately 2.1 miles of Graham Hill Road right-of-way for a pipeline. Chavez noted the existence of CA-SCR-162 and estimated the distance of CA-SCR-162 from Graham Hill Road at 0.2 miles (1,050 feet). Chavez recommended monitoring of construction on Graham Hill Road in the vicinity of the site. CA-SCR-162 is greater than 0.25 miles from the project site.

S-23744

Albion Environmental conducted an extended phase I archaeological assessment for a sewer project that intersected the portion of the project site along Ocean Street Extension that will be used as a temporary staging area (Pomerleau 2001). The report contains negative findings from an intensive survey effort and two subsurface test probes.

S-28809

Clark (2008) conducted extensive surveys for the San Lorenzo Valley Trail alignments. The survey coverage presented in the report includes the portion of the primary project site along the Graham Hill Road right-of-way. Clark did not report any found resources in the vicinity of the GHWTP.

S-36272

Hylkema (2009) surveyed the entire 13.2 acres of the GHWTP for an incidental take permit application. The survey covered all the primary project site within the boundaries of the GHWTP parcel. No new resources were reported.

S-40205

This report is from a records search and survey related to a sewer annexation project (Doane and Breschini 2013a). The project area for this report included all the primary project site along the Graham Hill Road right-of-way north of the entrance to the GHWTP. The report was negative for evidence of new archaeological resources.

S-43628

Doane and Breschini (2013b) conducted a records search and survey of the Santa Cruz Memorial Park Crematorium grounds for a landscaping project. The survey may have included a portion of the project site that will be used as a temporary staging area (Ocean Street Extension staging area) but the report did not include a survey coverage map. The Crematorium property is west of and adjacent to this staging area. Doane and Breschini found no evidence of prehistoric or historical period resources.

S-0 52810

As part of the City of Santa Cruz Concrete Tank Replacement, Albion (2019) conducted an extended Phase I archaeological assessment. The assessment included a records search, Native American outreach, and intensive surface survey, and excavation of three shovel test pits to sample the subsurface for cultural materials. The area covered by the assessment is entirely within the GHWTP parcel. Albion did not identify any new resources from the assessment.

Previously Recorded Cultural Resources

The records search results that there are no previously recorded resources within the project site. There are eight recorded historical period resources outside of the project site but within the 0.25-mile buffer. These resources include three highway structures, four buildings, and one district, which are described in detail in Appendix E.

4.5.2.6 Historic Conditions of the Project Site

The following section summarizes historic resources conditions at the project site, as contained in the CRIER (see Appendix E). The results and findings are summarized below.

In order to assess the property's historical significance and integrity, the GHWTP was recorded and evaluated in consideration of City of Santa Cruz Historic Resource Inventory (CSCHRI) designation criteria and integrity requirements. A physical description of the property and its development history is provided in Appendix E. The property was previously evaluated for NRHP and CRHR in 2019 and was found ineligible for listing under NRHP and CRHR criteria (Carey & Co. 2019). The GHWTP was assessed for local historic significance in accordance with the significance criteria listed below in Section 4.5.3.3.2 (Municipal Code Section 24.12.440, amended by Ordinance No. 2003-14, effective April 22, 2003).

According to analysis conducted in the CRIER, the GHWTP is not eligible for listing in the NRHP, the CRHR, or the CSCHRI. The GHWTP was evaluated in accordance with Section 15064.5(a)(2–3) of the CEQA Guidelines and using the criteria outline in Section 5024.1 of the California Public Resources Code and does not appear to be a historical resource for the purposes of CEQA. It is also not considered a historic property under Section 106.

Additional Records Reviewed

The following report included coverage within the project site. The report was provided by the City and was not included in the CHRIS searches, despite having been previously submitted to CHRIS.

Carey & Co. 2019, City of Santa Cruz, Graham Hill Water Treatment Plant Concrete Tank Replacement Project Historic Resources Evaluation

As mentioned above, in 2019, Carey & Co. completed a historic resources evaluation report for the City of Santa Cruz Concrete Tank Replacement Project, a project at GHWTP to replace three concrete water storage tanks and two associated pump stations. The facilities proposed for removal were all part of the original water treatment plant constructed in 1959 and included in the GHWTP parcel. Carey & Co. evaluated the entire original treatment plant under NHPA Section 106 and CEQA eligibility criteria. No eligible resources were identified under either set of criteria.

4.5.2.7 Tribal Cultural Resources

Sacred Lands File Search

On April 26, 2021, Dudek sent a request to the NAHC for a search of their Sacred Lands File (SLF) for the vicinity of the project site. The SLF is a list of properties important to California's Native American tribes. On May 13, 2021, Dudek received a letter from the NAHC with *positive* findings from the SLF search with the Costanoan Ohlone Rumsen-Mutsen Tribe noted as the information contact for the SLF listing. NAHC also provided a list of seven Native American contacts that might have local knowledge of cultural and tribal cultural resources for the project site. A record of the SLF search and results is included in Appendix E.

Native American Information Outreach

On May 17, 2021, Dudek provided the SLF results and the NAHC list of Native American contacts to the City for use in their outreach efforts to the seven Native American contacts. All communication with local tribes was directly between the City and the Native American contacts provide by the NAHC for the Proposed Project. A communication log and supporting documentation are saved in a confidential appendix to the CRIER. The following information was provided by the City.

The City received responses from three of the seven contacts provided by the NAHC. Specifically, initial responses came from the following contacts:

- Patrick Orozco, Chairman, Costanoan Ohlone Rumsen-Mutsun Tribe
- Kanyon Sayers-Roods, MLD Contact, Indian Canyon Mutsun Band of Costanoan
- Mike Grone, Research Analyst, Amah Mutsun Land Trust.

Informal consultation occurred independently between City staff, Mr. Orozco, Ms. Sayers-Roods, and Mr. Grone, during which tribal representatives were given information related to the project, including a past technical report for the project site. A communication log and supporting documentation are included in a confidential appendix to the CRIER (Appendix E).

As a result of this informal project consultation, the Amah Mutsun Tribal Band (AMTB) requested to be added to the City's AB 52 consultation list. The City acknowledged the request and sent formal project notification under AB 52. During a subsequent meeting, all elements of the project site where excavation is planned were discussed in detail. The City provided a summary of the AB 52 consultation meeting to AMTB for acceptance and concurrence, which was provided by AMTB. This consultation did not lead to the identification of known tribal cultural resources within the project site boundaries.

4.5.3 Regulatory Framework

4.5.3.1 Federal

National Historic Preservation Act

The National Historic Preservation Act (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 USC 470f).

Title 36 of the Code of Federal Regulations, Part 800 (36 CFR 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 they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of Title 36 of the Code of Federal Regulations, Section 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.

4.5.3.2 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" (California Public Resources Code Section 5020.1[j]). 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" (California 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, enumerated below. According to California Public Resources Code Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) 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 CCR 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:

- California Public Resources Code Section 21083.2(g) defines "unique archaeological resource."
- California 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.
- California Public Resources Code Section 21074(a) defines "tribal cultural resources."
- California 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.
- California Public Resources Code Sections 21083.2(b)–(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites 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" (California 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 California 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 (California 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 (California 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]; California 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 California Register of Historical Resources; 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 California Register of Historical Resources 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.

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 (California Public Resources Code Section 21083.2[a], [b], and [c]).

California 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.
4. Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (California 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 (California 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 California 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 project. The City's contact for tribal communication for this Proposed Project is Jessica Martinez-McKinney (jmartinezmckinney@santacruzca.gov). A confidential communication log and supporting documentation of Native American Information Outreach is included in the CRIER (in Appendix B of Appendix E).

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 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.

4.5.3.3 Local

The study area for the Proposed Project includes the City and County. The general plans and, where relevant, the local coastal programs of these jurisdictions include policies and programs related to cultural resources and tribal cultural resources. Section 4.11, Land Use and Planning discusses applicable general plan policies related to cultural resources, as relevant to the Proposed Project.

Specific details are provided in this section about the City and County codes related to the historic inventories of these jurisdictions, as this information was used in the evaluation of the Proposed Project.

Santa Cruz County

Santa Cruz County Historic Resources Inventory

Historic Resources in the County are managed under the aegis of the County Planning Department. A list of Historic Resources is maintained in the County's Historic Resources Inventory that identifies those Historic Resources located in the unincorporated areas of the County.

A Historic Resource is defined in Chapter 16.42.030(I) of the Santa Cruz County as "…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 (County Code 16.42.030 (I) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008])."

A Historic District is defined in Chapter 16.42.30(E) of the Santa Cruz County Code as "…an area designated as a historic resource and which contains improvements that:

1. Have character of special historic or aesthetic interest or value; and
   - Represent one or more periods or styles of architecture typical of one or more eras in the history of the County; and
   - 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 (County Code 16.42.030 (E) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008])."

The processes for Historic Resource designation in Santa Cruz County are explained in Chapter 16.42.050 as follows:

A. Protected Historic Resources. The Santa Cruz County historic resources inventory shall consist of those structures, objects, properties, sites, and districts as designated by certified resolution of the Board of Supervisors and thereby incorporated by reference and made a part of this chapter, with subsequent amendments as provided for in subsection (E) of this section.

B. Rating of Significance. For purposes of administering the historic preservation program, general public information, and to aid in the nomination of historic resources to the National Register, designated historic structures, objects, sites and districts shall be assigned a National Register (NR) Rating Code for historic significance based upon guidelines published by the United States Department of the Interior, National Park Service as follows:
   1) NR-1. A property listed in the National Register of Historic Places.
   2) NR-2. A property that has been determined to be eligible for listing on the National Register by the U.S. Department of the Interior.
   3) NR-3. A property eligible, in the opinion of the County Historic Resources Commission, to be listed on the National Register of Historic Places.
   4) NR-4. Property which may become eligible for listing on the National Register if additional research provides a stronger statement of significance, or if the architectural integrity is restored. These buildings have either high architectural or historic significance, but have a low rating in the other categories.

5) NR-5. A property determined to have local historical significance.

6) NR-6. The County shall maintain a listing of those properties which have been evaluated and determined to be ineligible for designation as an historic resource based on the criteria in subsections (B) and (C) of this section and/or due to their deteriorated architectural integrity or condition. These properties shall be given a rating of significance of NR-6. An NR-6 rated property is part of the historic resource inventory but is not subject to the provisions of this chapter. An NR-6 rated property may be reevaluated periodically.

C. Designation Criteria. Structures, objects, sites, and districts shall be designated as historic resources if, and only if, they meet one or more of the following criteria and have retained their architectural integrity and historic value:

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.

City of Santa Cruz

Santa Cruz City Historic Building Survey

Cultural landmarks in the City are termed Historic Landmarks and are under the aegis of the Planning and Community Development Department, City of Santa Cruz. The City maintains a list of Historic Landmarks, as well as other built historic resources, in the Historic Building Survey. Historic Landmark is defined in Part 5: Historic Preservation within the Community Design Chapter, as "an individual structure or other feature, or group of structures on a single lot or site, or a site having special aesthetic, cultural, architectural, or engineering interest or value of an historical nature as a 'landmark'" (Municipal Code Section 24.12.420, amended by Ordinance No. 2003-14, effective April 22, 2003).

In order to become a Historic Landmark, or to be placed on the Historic Building Survey, a property must first be evaluated for local historic significance based on the following criteria (Municipal Code Section 24.12.440, amended by Ordinance No. 2003-14, effective April 22, 2003):

A. The property is either a building, site, or object that is:

1. Recognized as a significant example of the cultural, natural, archaeological, or built heritage of the city, state, or nation.

2. Associated with a significant local, state, or national event.

3. Associated with a person or persons who significantly contributed to the development of the city, state, or nation.

4. Associated with an architect, designer, or builder whose work has influenced the development of the city, state, or nation.

5. Recognized as possessing special aesthetic merit or value as a building with quality of architecture and that retains sufficient features showing its architectural significance.

6. Recognized as possessing distinctive stylistic characteristics or workmanship significant for the study of a period, method of construction, or use of native materials.
7. Retains sufficient integrity to accurately convey its significance.

The district is:

8. Recognized as a geographically definable area possessing a significant concentration of buildings that are well designed and other structures, sites, and objects which are united by past events or by a plan or physical development.
9. Recognized as an established and geographically definable neighborhood united by culture, architectural styles or physical development.

Santa Cruz City Historic Districts

The City recognizes two historic districts and several potential historic districts. A City Historic District is evaluated and defined by the following criteria (Municipal Code Section 24.06.120, amended by Ordinance No. 85-05, effective 1985):

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 Property Zoning Incentives Ordinance

As described by the City of Santa Cruz Department of Planning and Community Development, the Historic Property Zoning Incentive Ordinance (Ord. No. 2012-19) was adopted in December 2012 to expand existing zoning variations for use by individual buildings or properties listed on the Historic Building Survey or contributing buildings or properties situated within a recognized City Historic District. The ordinance permits several Variations to Development Standards to benefit previously listed properties and incentivize owners of eligible, unlisted properties to participate in local historic preservation efforts. Additionally, these variations help to ensure that new construction and alterations to existing historic properties within these areas conform to standards that will maintain the integrity of the City's historic landmarks, buildings, sites, objects, and contributing buildings within designated and recognized districts.

Historic Alteration and Demolition Permits

Regarding effects on federal and locally significant properties, the Santa Cruz Municipal Code states the following:

- Historic Alteration Permit: The purpose of this permit is to ensure that new construction and alterations are allowed in a manner which retains the integrity of the city's historic landmarks, buildings, sites and districts over time. Administrative historic alteration permits may be approved by the zoning administrator, without a public hearing, for minor alteration projects and accessory

structures. Historic alteration permits may be approved by the city historic preservation commission, after a public hearing, for non-minor alteration projects. Such a permit is required before any person shall carry out or cause to be carried out, on the site of a designated landmark, or on the site of a building listed in the City of Santa Cruz Historic Building Survey, or on the site of a structure in an historic overlay district, any material change in exterior appearance of any such site or structure through alteration, construction or relocation. This section of the Zoning Ordinance is also part of the Local Coastal Implementation Plan (Section 24.08.900).

- Historic Demolition Permit: The purpose of this permit is to ensure that no person shall demolish or cause to be demolished any building listed on the Santa Cruz Historic Building Survey, any designated historic landmark or any building in an historic overlay district without approval of an historic demolition permit (Section 24.08.1000).

4.5.4 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project on 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.

4.5.4.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project on 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, as listed below. 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.

4.5.4.2 Analytical Methods

Potential cultural resource and tribal cultural resource impacts were identified based on the results of the literature review, field survey, and other research summarized in Appendix E, and the impacts associated with construction of the Proposed Project. Once construction is complete, operation and maintenance are anticipated to occur as it currently exists. No operational activities are anticipated to result in ground disturbance or alteration of structures and therefore the impact analysis focuses on the construction impacts of the Proposed Project.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices), that would be implemented during construction to avoid or minimize impacts to cultural and tribal resources. Standard construction practices #15 (inadvertent discovery of archaeological resources), #16 (inadvertent discovery of human remains), and #20 (standard sensitivity training) apply to the Proposed Project. Where applicable, these

practices and their effectiveness in avoiding or minimizing impacts on cultural and tribal resources are described in 4.5.4.3, Project Impact Analysis.

Records Search and Native American Coordination

As described above, a CHRIS records search and a NAHC SLF search were conducted for the Proposed Project on April 28, 2021. The SLF is a list of properties important to California's Native American tribes. On May 13, 2021, Dudek received a letter from the NAHC with *positive* findings from the SLF search with the Costanoan Ohlone Rumsen-Mutsen Tribe noted as the information contact for the SLF listing. NAHC also provided a list of seven Native American contacts that might have local knowledge of cultural and tribal cultural resources for the project site. A record of the SLF search and results is included in the CRIER (Appendix B of Appendix E).

Surveys

Pedestrian surveys were conducted on the project site, including the primary project site and staging areas. Specifically, cultural resource specialists conducted an archaeological surface survey of the GHWTP parcel, utility corridor, Graham Hill Road right-of-way, and the Ocean Street Extension staging area on April 23, 2021. A survey of the Mt. Hermon Road staging area was conducted on December 2, 2020. On December 7, 2022, a focused survey on the alternate sanitary sewer lateral replacement area was performed. 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 5-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 project site. See Appendix E 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 E, one resource within the project site, the GHWTP complex, was identified and recorded to be at least 45 years of age. The GHWTP was evaluated for historic significance. The results of these evaluations are presented in Section 4.5.2.6, Historic Conditions of the Project Site. Potential impacts to historic architectural resources for the Proposed Project are detailed below.

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. Precise vertical

depths by project area were described in the CRIER, and are not anticipated to exceed 13 feet at the GHWTP, 9 feet at Graham Hill Road, and 6 feet along the utility corridor and the alternate sanitary sewer lateral replacement area (refer to Table 1 of Appendix E).

4.5.4.3 Project Impact Analysis

Impact CUL-1	Historical Resource (Built Environment Resources) (Significance Threshold A). The Proposed Project would not cause a substantial adverse change in the significance of historical built environment resource, pursuant to Section 15064.5. ***(Less than Significant)***

As described above, the GHWTP was evaluated for listing in the NRHP, the CRHR, and the CSCHRI and was found ineligible under all criteria. As such, the GHWTP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA. The recommended Status Code for the GHWTP is 6Z (found ineligible for the NRHP, CRHR, or local designation through survey evaluation).

Construction

Construction would include the following activities: demolition of existing buildings; tree and vegetation removal; clearing, grubbing, excavation/fill, and grading; foundation installation and construction of new buildings; construction and installation of process equipment and tanks; trenching and installation of new yard piping and conduit; paving in roadway, paths and parking areas; and installation of landscaping, fencing, and signage.

The Proposed Project includes demolition of some existing buildings, water treatment facilities (e.g., a portion of the existing sedimentation basins), and some of the existing infrastructure, as needed, to address facilities beyond their useful life or to accommodate new facilities. As described above, the GHWTP, including all of the buildings described, was found ineligible under all NRHP, CRHR, and CSCHRI criteria. As such, the existing GHWTP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA, and thus, construction would not result in adverse impacts to a historical resource. The construction-related impacts of the Proposed Project would be less than significant.

Operation

After construction, except for planned and unplanned outages, the GHWTP would continue to operate 24 hours a day, 365 days a year, as is the case under existing conditions. Operation and maintenance of the upgraded GHWTP with the Proposed Project would include many activities largely consistent with current activities. The Proposed Project includes new processes (e.g., ozone contact, future granular activated carbon [GAC] adsorption, portions of the solids handling system) that would require additional operations support, as well as additional maintenance requirements. The proposed operational changes would be nominal and, as stated above, the GHWTP was found ineligible as a historic resource under federal, state, and local listings. For these reasons, operations under the Proposed Project would not have the potential to impact historic built environment resources; operation-related impacts would also be less than significant.

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	Unique Archaeological Resource and Human Remains (Significance Thresholds B and C). The Proposed Project would not cause a substantial adverse change in the significance of unique archaeological resources (pursuant to Section 15064.5) or historical resources of an archaeological nature, and/or disturb human remains. ***(Less than Significant)***

No archaeological resources were identified within the project site during the CHRIS records search or archaeological field survey. The results of these assessments suggest there are no historic properties of an archaeological nature within the project site. Specifically, the records search did not identify any known archaeological resources within the project site and the surface survey of all elements of the project site where excavation is planned (GHWTP, utility corridor, Graham Hill Road right-of-way, and the alternate sanitary sewer lateral replacement area) was uniformly negative for evidence of previously unknown archaeological resources. On March 7, 2023, SHPO sent the finding of effect that indicated pursuant to 36 CFR Section 800 4(d)(1), EPA has made a finding of No Historic Properties Affected.

Construction

Construction would include the following ground-disturbing activities that have the potential to affect unearth archaeological resources: clearing, grubbing, excavation/fill, and grading; foundation installation and construction of new buildings; and trenching and installation of new yard piping and conduit. As indicated by the results of the records search and field surveys, there is low potential for encountering any unknown archaeological resources during construction (refer to Appendix E). However, there is potential for previously unknown, subsurface archaeological deposits and/or human remains to be uncovered during earth disturbing activities. As part of the City's standard construction practices, which are included in the Proposed Project, the City or its contractors would be required to implement procedures pursuant to CEQA and the NHPA in the case of an inadvertent unrecorded archaeological resource discoveries (e.g., sites, features, and/or artifacts) or human remains during construction. The measures include the following procedures for standard sensitivity training, and inadvertent discovery of archaeological resources and human remains, which are described in Section 3.4.4.4 and provided below:

- Standard Construction Practice #15 (Archaeological Resources). 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:
  a. 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 any federal lead agency and is contingent on the approved course of action in response to the discovery.
  b. Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager.
  c. 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.

d. 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.

e. 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.

f. 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.

g. 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.

h. 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.

i. A full written report will be prepared to include the results of all technical analyses and special studies 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.

- Standard Construction Practice #16 (Archaeological Resources – Human Remains). 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.

  a. 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.

  b. 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.

c. 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.

d. 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.

e. The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).

f. 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.

- Standard Construction Practice #20 (Cultural Resources Training). Provide a cultural resource sensitivity training for workers prior to conducting earth disturbance in the vicinity of a documented cultural-resource-sensitive area. Prior to site mobilization or construction activities, a qualified archaeologist (as defined in SCP#15[c]) with training and experience in California prehistory and historical-period archaeology shall conduct the cultural resources awareness training for all construction personnel. The training format may be in person, virtual, or a video recording. The training shall address the identification of buried cultural deposits, including Native American and historical-period archaeological deposits and potential tribal cultural resources, and cover identification of typical prehistoric archaeological site components including midden soil, lithic debris, and dietary remains as well as typical historical-period remains such as glass and ceramics. The training must also explain procedures for stopping work if suspected resources are encountered. Any personnel joining the work crew subsequent to the training shall also receive the same training before beginning work.

Implementation of these measures as part of the Proposed Project would minimize the potential for construction-period effects related to inadvertent discovery of archaeological resources and human remains by conducting standard sensitivity training, stopping work if a resource is found during construction and establishing an exclusion zone; notifying the City, the federal lead agency if involved, and the Coroner, as specified in the measures; having a qualified archaeologist evaluate the find for eligibility to the CRHR and the NRHP; preserving the find in place, if determined to be eligible for listing or otherwise important; preparing and implementing a data recovery/treatment plan with appropriate coordination, if preservation in place is not feasible; preparing and filing a full written report; and providing for permanent curation for recovered materials. If human remains are involved the procedures presented in standard construction practice #16 would be implemented. Therefore, with implementation of the City's standard construction practices, the construction-related impacts of the Proposed Project related to unknown archaeological resources and human remains, would be less than significant.

Operation

As discussed in Impact CUL-1, after construction, the GHWTP would continue to operate 24 hours a day, 365 days a year except for planned and unplanned outages, as is the case under existing conditions. Operation and maintenance of the upgraded GHWTP with the Proposed Project would include many activities largely consistent with current activities. The Proposed Project includes new processes (e.g., ozone contact, future GAC adsorption, portions of the solids handling system) that would require additional operations support, as well as additional

maintenance requirements. The proposed operational changes would be nominal and, as stated above, no archaeological resources were identified within the project site during project site reconnaissance. For these reasons, operations under the Proposed Project would not have the potential to impact archaeological resources or human remains; operation-related impacts would also be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to archaeological resources or human remains, and therefore, no mitigation measures are required.

Impact CUL-3	Tribal Cultural Resources (Significance Threshold D). The Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource. ***(Less than Significant)***

A NAHC SLF search was conducted for the preparation of CRIER covering study area and a 0.25-mile buffer from the study area. As a result of this search, on May 13, 2021, Dudek received a letter from the NAHC with *positive* findings with the Costanoan Ohlone Rumsen-Mutsen Tribe noted as the information contact for the SLF listing. The NAHC also provided a list of seven Native American contacts that might have local knowledge of cultural and tribal cultural resources for the project site. Dudek provided the SLF results and the NAHC list of Native American contacts to City staff for use in their outreach efforts to the seven Native American contacts. All communication with local tribes was directly between the City and the Native American contacts provide by the NAHC for the Proposed Project.

The City received responses from three of the seven contacts provide by the NAHC. Specifically, initial responses came from the following contacts:

- Patrick Orozco, Chairman, Costanoan Ohlone Rumsen-Mutsun Tribe
- Kanyon Sayers-Roods, MLD Contact, Indian Canyon Mutsun Band of Costanoan
- Mike Grone, Research Analyst, Amah Mutsun Land Trust.

Informal coordination occurred independently between City staff, Mr. Orozco, Ms. Sayers-Roods, and Mr. Grone, during which tribal representatives were given information related to the project, including a past technical report for the project site. As described in Section 4.5.2.7, as a result of this informal project coordination, AMTB requested to be added to the City's AB 52 consultation list and the City held an AB 52 consultation meeting with the AMTB. The City provided a summary of the AB 52 consultation meeting to AMTB for acceptance and concurrence, which was provided by the AMTB. This consultation did not lead to the identification of known tribal cultural resources within the project site boundaries.

As discussed under Impact CUL-2, 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 consultation, and field survey did not identify any archaeological resources within the primary project site or staging areas or any specific cultural resource sensitivity concerns. There are no known resources that intersect the project site that would be considered tribal cultural resources. Furthermore, standard sensitivity training would be conducted and in the event that unknown, archaeological sites or tribal cultural resources are uncovered during the course of construction City standard construction practices (see #15, #16, and #20 described under Impact CUL-2) would be implemented. 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.

4.5.4.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative cultural resources and tribal cultural resources impacts from 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 where relevant to this topic. The geographic area of analysis for cumulative impacts to cultural resources and tribal cultural resources is the County and therefore all of the cumulative projects listed in Table 4.0-1 are relevant to the cumulative analysis.

Impact CUL-4	Cumulative Cultural Resource and Tribal Cultural Resource 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 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 the County. The cumulative projects considered include other City of Santa Cruz Water Department planned capital investment projects, construction/development projects proposed within the County, or improvement projects on nearby state facilities. 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 and tribal cultural resources, the loss of any one cultural resource or tribal cultural 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 and/or human remains (Impact CUL-2), or tribal cultural resources (Impact CUL-3). The Proposed Project would not contribute to cumulative impacts related to cultural resources or tribal cultural resources as no cumulative projects have been identified to which the Proposed Project would contribute impacts.

4.5.5 References

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4.6 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 impacts related to implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on energy consumption modeling for the Proposed Project, as part of the preparation of this environmental impact report (EIR). The results of the modeling are summarized in this section, and included in Appendix C.

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. One public comment was received from a neighboring resident that related to energy. The letter requested that solar power and battery storage be incorporated into the Proposed Project.

4.6.1 Existing Conditions

This section outlines the existing energy service and Countywide demands for electricity, natural gas, and petroleum fuels.

4.6.1.1 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 privately owned public utilities in the state are regulated by the California Public Utilities Commission (CPUC) (PG&E 2023).

Central Coast Community Energy (3CE), formerly Monterey Bay Community Power, 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 support 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 2023). Notably, the City of Santa Cruz purchases electricity from 3CE for its municipal facility operations.

According to the U.S. Energy Information Administration (EIA), California used approximately 247,250 gigawatt hours of electricity in 2021 (EIA 2022a). 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. In 2019, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than all other states except Rhode Island, due in part to its mild climate and energy efficiency programs (EIA 2022b).

In Santa Cruz County, PG&E reported an annual electrical consumption of approximately 1,162 million kilowatt hours (kWh) in 2021, with 581 million kWh for non-residential use and 581 million kWh for residential use (CEC 2023a).

According to the EIA, California used approximately 2,092,612 million cubic feet of natural gas in 2021 (EIA 2023a). 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 2021). Large consumers, such as electric generators and industrial customers (noncore customers), account for approximately 65% of the natural gas delivered by California utilities (CPUC 2021). 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; however, the State has adopted regulations requiring its development to reduce statewide emissions of methane by 40% below 2013 levels by 2030 (CPUC 2022).

In 2021, PG&E had delivered approximately 53 million therms to Santa Cruz County, with 33 million therms for non-residential use and 20 million therms for residential use (CEC 2023b).

4.6.1.2 Transportation-Related Energy Consumption

According to the EIA, California used approximately 524 million barrels of petroleum in 2020, with the majority (433 million barrels) used for the transportation sector, which was a substantial reduction from 2019 (659 million barrels of petroleum) due to the COVID-19 pandemic (EIA 2023b). According to EIA's "Energy Outlook 2021", it may take years for the U.S. to return to 2019 levels of energy consumption following the impact of COVID-19 on the U.S. economy and global energy sector (EIA 2021). There are 42 U.S. gallons in a barrel, so in 2020, total daily use of approximately 60.3 million gallons of total petroleum was consumed in California. Petroleum usage in California includes petroleum products such as motor gasoline, distillate fuel, liquefied petroleum gases, and jet fuel. At the federal and state levels, various policies, rules, and regulations have been enacted to improve vehicle fuel efficiency, promote the development and use of alternative fuels, reduce transportation-source air pollutants and greenhouse gas (GHG) emissions, and reduce vehicle miles traveled (VMT). Market forces have driven the price of petroleum products steadily upward over time, and technological advances have made use of other energy resources or alternative transportation modes increasingly feasible.

Largely as a result of and in response to these multiple factors, gasoline consumption within the state has declined in recent years, and availability of other alternative fuels/energy sources has increased. The quantity, availability, and reliability of alternative transportation energy resources have increased in recent years, and this trend will likely continue and accelerate. Increasingly available and diversified transportation energy resources act to promote continuing reliable and affordable means to support vehicular transportation within the state. According to the California Air Resources Board (CARB) Emission Factor (EMFAC) Web Database, Santa Cruz County on-road transportation sources are projected to consume about 82.3 million gallons of petroleum in 2029 (CARB 2021), which is analyzed as the first year of Proposed Project operations herein.

4.6.2 Regulatory Framework

Although the focus of many of the federal and state regulations is on the reduction of air pollutants and GHG emissions, one co-benefit of implementation of these standards is a reduced demand for energy resources. As such, this section only presents regulations that pertain to energy that are either not included in Chapter 4.3 (Air

Quality) or Chapter 4.8 (Greenhouse Gas Emissions) of the EIR, or that are specifically referenced in the energy impact determinations herein.

4.6.2.1 Federal

Federal Energy Policy and Conservation Act and CAFE Standards

In 1975, Congress enacted the federal Energy Policy and Conservation Act that established the first fuel economy standards, known as the Corporate Average Fuel Economy (CAFE) standards, for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards. In 2012, new CAFE 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.

Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 was passed to reduce the country's dependence on foreign petroleum and improve air quality. The act includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. The act requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in the act. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. The Energy Policy Act also requires states to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law. In addition to setting increased CAFE standards for motor vehicles, the EISA facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.
- Requiring approximately 25% greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200% greater efficiency for light bulbs, or similar energy savings, by 2020.
- While superseded by the U.S. Environmental Protection Agency (EPA) and NHTSA actions described previously, establishing miles per gallon targets for cars and light trucks and directing the NHTSA to establish a fuel economy program for medium-and heavy-duty trucks and create a separate fuel economy standard for trucks.

This federal legislation requires ever-increasing levels of renewable fuels (the RFS) to replace petroleum (EPA 2023). EPA is responsible for developing and implementing regulations to facilitate that transportation fuel sold in the United States contains at least a minimum volume of renewable fuel.

The RFS program was created under the Energy Policy Act and established the first renewable fuel volume mandate in the United States. As required under the Energy Policy Act, the original RFS program 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 ways that laid the foundation for achieving significant reductions in 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:

- The EISA expanded the RFS program to include diesel, in addition to gasoline.
- The 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.
- The EISA established new categories of renewable fuel and set separate volume requirements for each one.
- The EISA required 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 (environmentally beneficial) jobs.

Intermodal Surface Transportation Efficiency Act of 1991

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.

Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century was signed into law in 1998 and builds on the initiatives established in the ISTEA legislation (previously discussed). The Transportation Equity Act authorizes highway, highway safety, transit, and other efficient surface transportation programs. The act continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of transportation decisions. The Transportation Equity Act also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of intelligent transportation systems to help improve operations and management of transportation systems and vehicle safety.

4.6.2.2 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:

- The act 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

CEC and CPUC approved the first State of California Energy Action Plan in 2003. The Energy Action Plan established shared goals and specific actions to support 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, CEC and CPUC adopted a second Energy Action Plan to reflect various policy changes and actions of the preceding 2 years.

At the beginning of 2008, 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 in "Assembly Bill 32 and Senate Bill 32"). Rather than produce a new Energy Action Plan, CEC and CPUC prepared an update that examines the state's ongoing actions in the context of global climate change.

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 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.

California Building Standards

The California Building Standards Code was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every 3 years by the Building Standards Commission and the CEC and revised if necessary (California Public Resources Code Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, to "reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy"

(California Public Resources Code Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code Section 25402[d]) and cost effectiveness (California Public Resources Code Section 25402[b][2–3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The current Title 24 standards are the 2022 Title 24 building energy efficiency standards, which became effective January 1, 2023.

In addition to CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24), which is commonly referred to as California's Green Building Standards (CALGreen), establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality.

4.6.2.3 Local

Metropolitan Transportation Plan/Sustainable Communities Strategy

The primary local plan that would result in reduced energy demand, specifically petroleum fuels from VMT reduction strategies, is the Association of Monterey Bay Area Governments *Monterey Bay 2045 Moving Forward – 2045 Metropolitan Transportation Plan/Sustainable Communities Strategy* (2045 MTP/SCS) (AMBAG 2022). See also Chapter 4.8, Greenhouse Gas Emissions, for a detailed description of the 2045 MTP/SCS.

4.6.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of 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 is also identified.

4.6.3.1 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.

B. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.6.3.2 Analytical Methods

Potential impacts related to energy were identified based on energy consumption modeling for the Proposed Project. The results of the energy modeling are summarized in this section, and included in Appendix C. 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. The City has

identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. However, there are no City standard construction practices applicable to energy that are part of the Proposed Project. Additional information on how impacts were analyzed is provided below.

Construction

Electricity

The amount of electricity used during construction of the Proposed Project would be minimal because demand generally would be generated from use of electrically powered hand tools. As such, construction electricity demand is qualitatively addressed.

Natural Gas

Natural gas is not anticipated to be required during construction of the Proposed Project; therefore, construction natural gas demand is qualitatively addressed.

Petroleum

Potential impacts were assessed for off-road equipment and on-road vehicle trips during construction based on the California Emissions Estimator Model (CalEEMod) outputs (see Appendix C). Fuel consumption from equipment and vehicles was estimated by converting the total carbon dioxide (CO_2) emissions 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 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 2022). 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-powered light-duty vehicles. The details for construction criteria air pollutant emissions modeling discussed in the air quality section apply to the energy analysis as well (see Section 4.3, Air Quality, Analytical Methods).

Operation

Energy consumption in support of or related to Proposed Project operations would include facilities energy demands (energy consumed by building operations and site maintenance activities), transportation energy demands (energy consumed by on-road vehicles accessing the project site), off-road equipment, and stationary sources. Notably, the existing facility operations also include these energy demands.

Electricity

The Proposed Project's operational phase would require electricity for multiple purposes including, but not limited to, water treatment process equipment, water conveyance, building heating and cooling, lighting, and appliances, including refrigeration, electronics, equipment, machinery, and electric vehicle charging. The existing facility has similar aspects that require electricity, but with different facility components and water conveyance flows, as well as no vehicles requiring electric charging. The existing and anticipated Proposed Project electricity demands were provided by the City and are included in Section 4.6.3.3 below.

Natural gas

The Proposed Project would result in an all-electric building, which would eliminate the natural gas demand required for the existing facility. The natural gas demand for the existing scenario was provided by the City and is included in Section 4.6.3.3 below.

Petroleum

The fuel consumption resulting from the Proposed Project's operational phase would primarily be attributable to vehicles traveling to and from the project site. The Proposed Project and existing baseline scenarios have the same number of staff; however, the Proposed Project is anticipated to require approximately 514 one-way truck trips (chemical delivery, future granular activated carbon, and dewatered sludge) on an annual basis, whereas the existing baseline only entails approximately 88 one-way chemical delivery trucks per year.

Energy that would be consumed by traffic is a function of total VMT and estimated vehicle fuel economies for the vehicles accessing the facility site. With respect to estimated VMT and based on the trip frequency and trip lengths provided by the City, the Proposed Project (including the existing baseline) would generate an estimated 25,700 annual VMT along roadways for trucks and 108,150 annual VMT for employee vehicles. For the existing baseline alone, the facility generates 4,400 annual VMT along roadways for trucks and 108,150 annual VMT for employee vehicles. Note, that there is no net increase in VMT from employee vehicles with the Proposed Project, as indicated above, as no new staff would be hired to operate the upgraded facilities.

Regarding diesel-fueled off-road equipment, the Proposed Project may require an extendable forklift operating at 8 hours for one day per month. The Proposed Project and existing baseline also include a diesel-fueled 2,092-horsepower (hp) emergency backup generator that was assumed to operate one hour a day for up to 50 hours a year for routine testing and maintenance. The existing propane forklift would continue to be used for the Proposed Project was modeled as compressed natural gas but included in the diesel fossil fuel category for simplicity.

Finally, gasoline was assumed to be required for landscaping equipment. Fuel consumption from all operational equipment and vehicles was estimated by converting the total CO_2 emissions to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. Details of these calculations and assumptions are provided in Appendix C.

4.6.3.3 Project Impact Analysis

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 3CE. 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 and the impact would be less than significant.

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 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 and the impact would be less than significant.

Petroleum

Offroad equipment used during construction of the Proposed Project would primarily rely on diesel fuel, as would vendor and haul trucks. In addition, construction workers would travel to and from the project site throughout the duration of construction.

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 4.6-1.

Table 4.6-1. Total Proposed Project Construction Petroleum Demand

Year	Off-Road Equipment (diesel)	Haul Trucks (diesel)	Vendor Trucks (diesel)	Worker Vehicles (gasoline)
	Gallons			
2024	2,352	0	19	68
2025	79,936	15,711	4,352	7,160
2026	27,768	0	4,818	4,876
2027	27,753	0	4,723	4,769
2028	23,451	0	3,354	3,692
Total by Category	**161,260**	**15,711**	**17,267**	**20,564**
	Total Petroleum Consumed for Project Construction			**214,803**

Source: Appendix C.

In summary, construction associated with the development of the Proposed Project is estimated to consume a total of approximately 214,803 gallons of petroleum. Notably, the Proposed Project would 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 requirements.

Overall, while construction activities would consume petroleum-based fuels, consumption of such resources would be temporary and would cease upon the completion of construction. Further, the petroleum consumed related to construction would be typical of construction projects of similar types and sizes and would not necessitate new petroleum resources beyond what are typically consumed in California. Therefore, because petroleum use during

Proposed Project construction would be temporary and minimal and would not be wasteful or inefficient, impacts would be less than significant.

Operations

Electricity

Based on information provided by the City, the Proposed Project would consume approximately 4,456,625kWh of electricity per year during operation. The existing facility consumes approximately 1,482,800 kWh per year. As such, upon Proposed Project implementation, electricity demand at the project site would increase by approximately 2,973,825 kWh per year. Part of this increase in electricity use for the Proposed Project is due to the elimination of natural gas and replacement with electricity, which is a cleaner and potentially renewable energy source.

Although electricity consumption would increase with the Proposed Project, the Proposed Project would provide for a modernized treatment plant that: meets contemporary building, electrical, and fire code requirements; supports the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and Securing Our Water Future Policy (SOWF) Policy; increases the City's treatment reliability to meet current and anticipated future water quality requirements; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire and severe storms.

Furthermore, the additional electricity demand for the Proposed Project would be comparable to other similar projects of scale and configuration and would not be unusual or wasteful as compared to overall local and regional demand for energy resources. For these reasons, electricity consumption of the Proposed Project would not be considered inefficient or wasteful, and impacts would be less than significant.

Natural Gas

As previously discussed under Section 4.6.3.2, the Proposed Project would result in an all-electric facility and would eliminate the existing demand for natural gas. The existing facility consumes approximately 634,400 thousand British thermal units (kBTU) per year. As such, upon Proposed Project implementation, natural gas demand at the project site would decrease by 634,400 kBTU per year. For this reason, the natural gas consumption of the Proposed Project would not be considered inefficient or wasteful, and impacts would be less than significant.

Petroleum

During operations, fuel consumption would involve the use of motor vehicles traveling to and from the project site, emergency generator testing and maintenance, off-road equipment, and landscaping equipment. Fuel demand estimates for the Proposed Project and existing baseline scenarios are provided in Table 4.6-2.

Table 4.6-2. Annual Operational Petroleum Demand

Scenario	Employee Vehicles (gasoline)	Trucks (diesel)	Emergency Generator (diesel)	Off-Road Equipment (diesel)	Landscape Equipment (gasoline)	Total Petroleum
	Gallons (per year)					
Proposed Project Operations	3,648	3,746	5,344	416	145	13,299
Existing Operations	4,244	535	5,344	0	96	10,445

Table 4.6-2. Annual Operational Petroleum Demand

Scenario	Employee Vehicles (gasoline)	Trucks (diesel)	Emergency Generator (diesel)	Off-Road Equipment (diesel)	Landscape Equipment (gasoline)	Total Petroleum
	Gallons (per year)					
Net Change (Project - Existing)	(596)	3,211	0	416	187	2,854

Source: Appendix C.
Values in parentheses represent a negative number.

As summarized in Table 4.6-2, the Proposed Project would result in an estimated net annual increase in fuel demand of approximately 2,854 gallons of petroleum. Fuel would be provided by current and future commercial vendors. Trip generation and VMT associated with the Proposed Project are consistent with other water treatment plant uses of similar scale and configuration. That is, the Proposed Project does not propose uses or operations that would inherently result in excessive and wasteful activities, nor associated excess and wasteful vehicle energy consumption.

The location of the Proposed Project proximate to regional and local roadway systems also tends to reduce VMT within the region, acting to reduce regional vehicle energy demands. Finally, enhanced fuel economies realized pursuant to federal and state regulatory actions, and related transition of vehicles to alternative energy sources (e.g., electricity, natural gas, biofuels, hydrogen cells) would likely decrease future fuel demands per VMT. As supported by the preceding discussions, the Proposed Project's operational petroleum consumption would not be considered inefficient, wasteful, or otherwise unnecessary and impacts would be less than significant.

Renewable Energy Potential

As part of the Proposed Project's design process, the City considered how the Proposed Project could potentially increase its reliance on renewable energy sources to meet the Proposed Project's energy demand. Renewable energy sources that were considered for their potential to be used to power the Proposed Project, consistent with the CEC's definition of eligible renewables, include biomass, geothermal, solar, wind, and small hydroelectric facilities.

Given the Proposed Project's location, there are considerable site constraints including incompatibility with surrounding land uses for large scale power generation facilities, unknown interconnection feasibility, compatibility with utility provider systems, and no known water or geothermal resources to harness, that would eliminate the potential for biomass, geothermal, and wind renewable energy to be installed onsite.

The Proposed Project would comply with all applicable Title 24 code provisions, such as the solar ready building mandatory requirements, where applicable. As the Proposed Project design progresses, consideration will be given to maximize solar access for the roofs. While the Proposed Project does not propose battery storage or hydroelectric generators at the time, the Proposed Project does not preclude installation of these technologies in the future if determined to be a feasible and compatible land use of the site. In addition, EV charging stations are included in the Proposed Project design.

Summary

As explained above, the Proposed Project would be designed to maximize solar generation and be solar ready as determined to be feasible and would not result in wasteful, inefficient, or unnecessary consumption of energy

resources, including electricity, natural gas, or petroleum during project construction or operation. Therefore, impacts would be less than significant.

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***)

Part 6 of Title 24 of the California Code of Regulations establishes energy efficiency standards for residential and non-residential buildings constructed in California to reduce energy demand and consumption. Part 6 is updated periodically (every 3 years) to incorporate and consider new energy efficiency technologies and methodologies. Title 24 also includes Part 11, the California Green Building Standards Code (CALGreen). CALGreen institutes mandatory minimum environmental performance standards for all ground-up, new construction of commercial and state-owned buildings. The components of the Proposed Project that include new and replacement structures would meet all applicable Title 24 and CALGreen standards to reduce energy demand and increase energy efficiency. For instance, as described previously, the new buildings to be developed for the Proposed Project will be solar ready and consideration will be given to maximize solar access for the roofs. In addition, EV charging stations are included in the Proposed Project design.

Additionally, as discussed in Section 4.8, Greenhouse Gas Emissions, the Proposed Project would not conflict with the various state and local plans that mandate reduced energy use. Therefore, the impact of the Proposed Project related to conflicts with or obstruction of a state or local plan for renewable energy or energy efficiency 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.

4.6.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative energy impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in identified in Table 4.0-1 in Section 4.0, Introduction to Analysis, and where relevant to this topic. The geographic area considered for the analysis of cumulative energy impacts is the project region. As such, all projects identified in Table 4.0-1 are relevant to this discussion.

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)***

Potential cumulative impacts related to 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 energy plan. All of the projects listed in Table 4.0-1 would have a construction period during which primarily 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. Regarding operations, it is anticipated that these other projects would also be designed to be comparable to other similar projects of scale and configuration and would not contribute to any potential cumulative energy impacts. Furthermore, any commercial and residential cumulative projects 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. 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 and the impact would be less than significant.

4.6.4 References

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4.7 Geology and Soils

This section describes the existing geology and soils conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based in part on a site-specific geotechnical report (AECOM/W.M. Lyles Co. 2023) which reviewed geologic information prepared for the Concrete Tanks Project by Group Delta Consultants, Inc. in 2018. The analysis is also based on review of the University of California Museum of Paleontology (UCMP) online specimen database for the Proposed Project, conducted as part of the preparation of this environmental impact report (EIR). In addition, the Natural History Museum of Los Angeles County (LACM) paleontological records search results for the Newell Creek Pipeline project were summarized since they overlap the project site.

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. Comments related to geology and soils were not received.

4.7.1 Existing Conditions

The Proposed Project is composed of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3 in Chapter 3, Project Description.

4.7.1.1 Regional Geologic Setting

The project site is 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, between Point Arguello, in Santa Barbara County, and the California/Oregon border. The project site is underlain in part by Pleistocene and 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. The geology of the Santa Cruz Mountains is dominated by gneiss, schist, limestone, quartzite, and granite, but Cretaceous through Holocene sedimentary rocks and lesser amounts of Tertiary volcanic rocks overlie much of the region (AECOM/W.M. Lyles Co. 2023; USGS 1981, 1997).

4.7.1.2 Site Geology and Stratigraphy

GHWTP Parcel

The GHWTP parcel is underlain by Pleistocene (approximately 11,700 to 2.6 million years ago [mya]; Cohen et al. [2023]) terrace deposits (map unit Qt) and late Miocene (approximately 5.3 mya to 11.6 mya; Cohen et al. [2023]) Santa Margarita Formation sandstone (map unit Tsm), which overlie Cretaceous (approximately 66 mya to 145 mya; Cohen et al. [2023]) granodiorite (map unit gd), and Mesozoic (approximately 66 mya to 251.9 mya;

Cohen et al. [2023]) or Paleozoic (approximately 251.9 mya to 538.8 mya; Cohen et al. [2023]) metasedimentary schist and quartzite (see Figure 4.7-1). The proposed building area on the GHWTP parcel is situated on an upper building pad, with the Concrete Tanks Project being constructed on a lower building pad (as a different project).

Previous geotechnical studies were performed at the GHWTP parcel, starting in 1958. Two borings were drilled by Dames and Moore in 1958, to depths of 40 and 50 feet below ground surface (bgs). Seven borings were drilled by Pacific Crest Engineering in 2009 to depths of 13.5 to 27 feet bgs. And three borings were drilled by Group Delta Consultants in 2017 to depths 25.5 to 35.5 feet bgs. More recently, three borings were drilled by AECOM/W.M. Lyles Co. in 2022 to depths of 41 to 41.5 feet bgs (AECOM/W.M. Lyles Co. 2023).

Based on these soil borings drilled at the GHWTP parcel, the upper pad is underlain by artificial fill deposits, 1 to 5 feet thick, and colluvium, overlying Santa Margarita sandstone, with schist encountered at depths in excess of 20 feet bgs. The Santa Margarita sandstone is a soft rock that exhibits properties similar to a medium dense to dense sand. The schist is decomposed and friable at the contact with the overlying Santa Margarita sandstone but becomes less weathered and more competent with depth. Terrace deposits, at least 25 feet thick and consisting of sand, silt, and clay, were encountered in borings drilled on the southeastern slope. Metasedimentary rocks, including schist and quartzite, were encountered below artificial fill deposits along the eastern side of the GHWTP. One boring drilled north of the existing sedimentation basins also encountered decomposed granodiorite (AECOM/W.M. Lyles Co. 2023).

Utility Corridor

The utility corridor is underlain by Mesozoic or Paleozoic metasedimentary schist and quartzite, as shown on Figure 4.7-1 (County of Santa Cruz 2020).

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way is underlain by Pleistocene terrace deposits and Miocene-age Santa Margarita Formation sandstone, as shown on Figure 4.7-1 (County of Santa Cruz 2020).

Alternate Sanitary Sewer Lateral Replacement Area

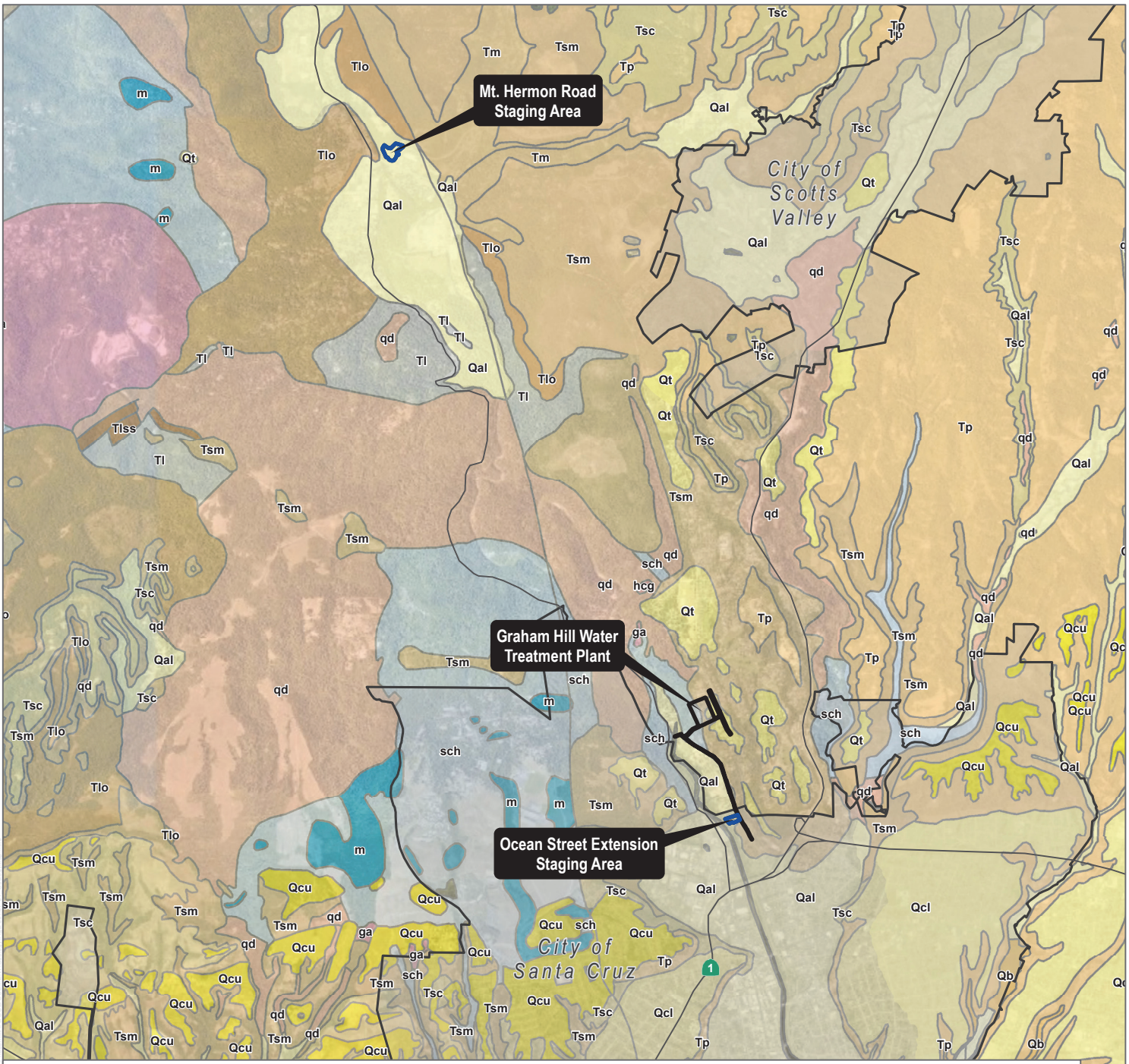
The alternate sanitary sewer lateral replacement area is underlain by Miocene-age Santa Margarita Formation sandstone, Mesozoic or Paleozoic metasedimentary schist and quartzite, and Holocene alluvial deposits (County of Santa Cruz 2020), which typically consist of relatively unconsolidated sand, silt, clay, and gravel (see Figure 4.7-1).

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is underlain by Holocene (less than 11,700 years ago; Cohen et al. [2022]) alluvium (County of Santa Cruz 2020), which typically consists of relatively unconsolidated sand, silt, clay, and gravel (see Figure 4.7-1).

Ocean Street Extension Staging Area

The Ocean Street Extension staging area is underlain by Miocene-age Santa Margarita Formation sandstone and Holocene alluvium (County of Santa Cruz 2020), which typically consists of relatively unconsolidated sand, silt, clay, and gravel (see Figure 4.7-1).



- Primary Project Site
- Staging Area
- Incorporated City Limits

Geologic Formation

- Qal : Alluvial deposits, undifferentiated (Holocene)
- Qb : Basin deposits (Holocene)
- Qbs : Beach sand (Holocene)
- Qcl : Lowest emergent coastal terrace deposits
- Qcu : Coastal terrace deposits, undifferentiated (Pleistocene)
- Qms : Marine nearshore and shelf deposits (late Holocene)
- Qms / Tp : Marine nearshore and shelf deposits (late Holocene) / Purisima Formation (Pliocene and late Miocene)
- Qmsc : Coarse-grained marine nearshore and shelf deposits (late Holocene)
- Qmsd : Marine shelf scour depressions (late Holocene)
- Qt : Terrace deposits, undifferentiated (Pleistocene)
- Tl : Locatelli Formation (Paleocene)
- Tlo : Lompico Sandstone (middle Miocene)
- Tlss : Sandstone
- Tm : Monterey Formation (middle Miocene)
- Tp : Purisima Formation (Pliocene and late Miocene)
- Tp : Purisima Formation (Pliocene and upper Miocene)
- Tsc : Santa Cruz Mudstone (late Miocene)
- Tsc : Santa Cruz Mudstone (upper Miocene)
- Tsm : Santa Margarita Sandstone (upper Miocene)
- af : Artificial fill
- ga : Granite and adamellite (Cretaceous)
- gd : Gneissic granodiorite (Cretaceous)
- hcg : Hornblende-cummingtonite gabbro (Cretaceous)
- m : Marble (Mesozoic or Paleozoic)
- qd : Quartz diorite (Cretaceous)
- sch : Metasedimentary rocks (Mesozoic or Paleozoic)

SOURCE: Bing Maps Accessed 2020, URS 2013, County of Santa Cruz 2020, USGS 2020

DUDEK

0 2,500 5,000 Feet

FIGURE 4.7-1

Geology Map

Graham Hill Water Treatment Plant Facility Improvements Project

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4.7.1.3 Surficial Soils

GHWTP Parcel

Based on mapping by the U.S. Department of Agriculture Soil Conservation Service, the surficial soils underlying the GHWTP parcel consist of Watsonville loam and Zayante-Rock outcrop complex (see Figure 4.7-2a). The Watsonville loam occurs on 2% to 15% slopes and consists of hard to very hard, sticky, plastic, sandy loam, loam, sandy clay loam, or clay loam. These soils are somewhat poorly drained, have slow to rapid runoff, and very slow permeability (National Cooperative Soil Survey 2015; USDA SCS 2023). The Zayante-Rock outcrop complex occurs on 30% to 75% slopes and consists of deep, loose, massive, soft, very friable, coarse sand, with approximately 30% rock outcrop. These soils are somewhat excessively drained, have slow to rapid runoff, and rapid permeability (National Cooperative Soil Survey 1998). Because extensive cut-and-fill grading has been completed at the GHWTP parcel, the majority of these surficial soils are no longer present at the surface.

Utility Corridor

The surficial soils underlying the utility corridor consist primarily of Zayante-Rock outcrop complex, as described above, with a minor amount of Elder sandy loam at the southwest end of the corridor (see Figure 4.7-2a). Elder sandy loam occurs on 2% to 9% sloping floodplains and alluvial fans and consists of sandy loam that is well-drained and has low runoff (USDA SCS 2023).

Graham Hill Road Right-of-Way

The surficial soils underlying the Graham Hill Road right-of-way consist of Watsonville loam, as described above and shown in Figure 4.7-2a (National Cooperative Soil Survey 2015).

Alternate Sanitary Sewer Lateral Replacement Area

The surficial soils underlying the alternate sanitary sewer lateral replacement area consist primarily of Elder sandy loam and Watsonville loam, as described above, with minor amounts of Baywood sandy loam (see Figure 4.7-2a, Figure 4.7-2b, and Figure 4.7-2c). The latter occurs on 0% to 2% sloping valley floors, is somewhat excessively drained, and has very low runoff (USDA SCS 2023).

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is underlain by Elkhorn sandy loam, which occurs on 2% to 9% slopes on terraces and alluvial fans (see Figure 4.7-2d). These soils consist of sandy loam and sandy clay loam and are well-drained, with medium runoff (USDA SCS 2023).

Ocean Street Extension Staging Area

The Ocean Street Extension staging area is underlain by Elder sandy loam and Watsonville loam, as described above and shown in Figure 4.7-2c (National Cooperative Soil Survey 2015).

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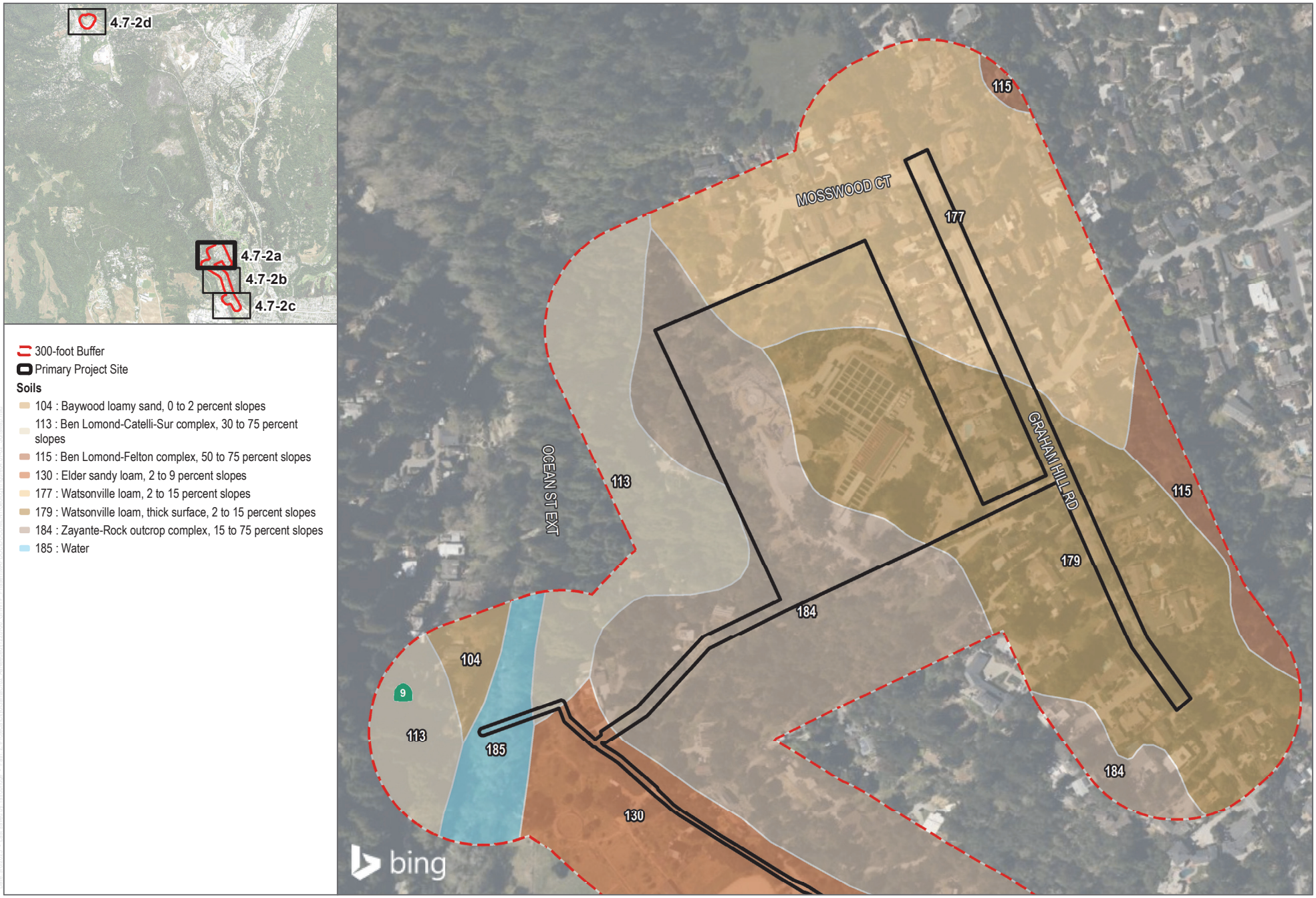

SOURCE: Bing Maps 2021, HDR 2020, USDA SSURGO

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0 175 350 Feet

FIGURE 4.7-2a

Soils Map - Graham Hill Water Treatment Plant

Graham Hill Water Treatment Plant Facility Improvements Project

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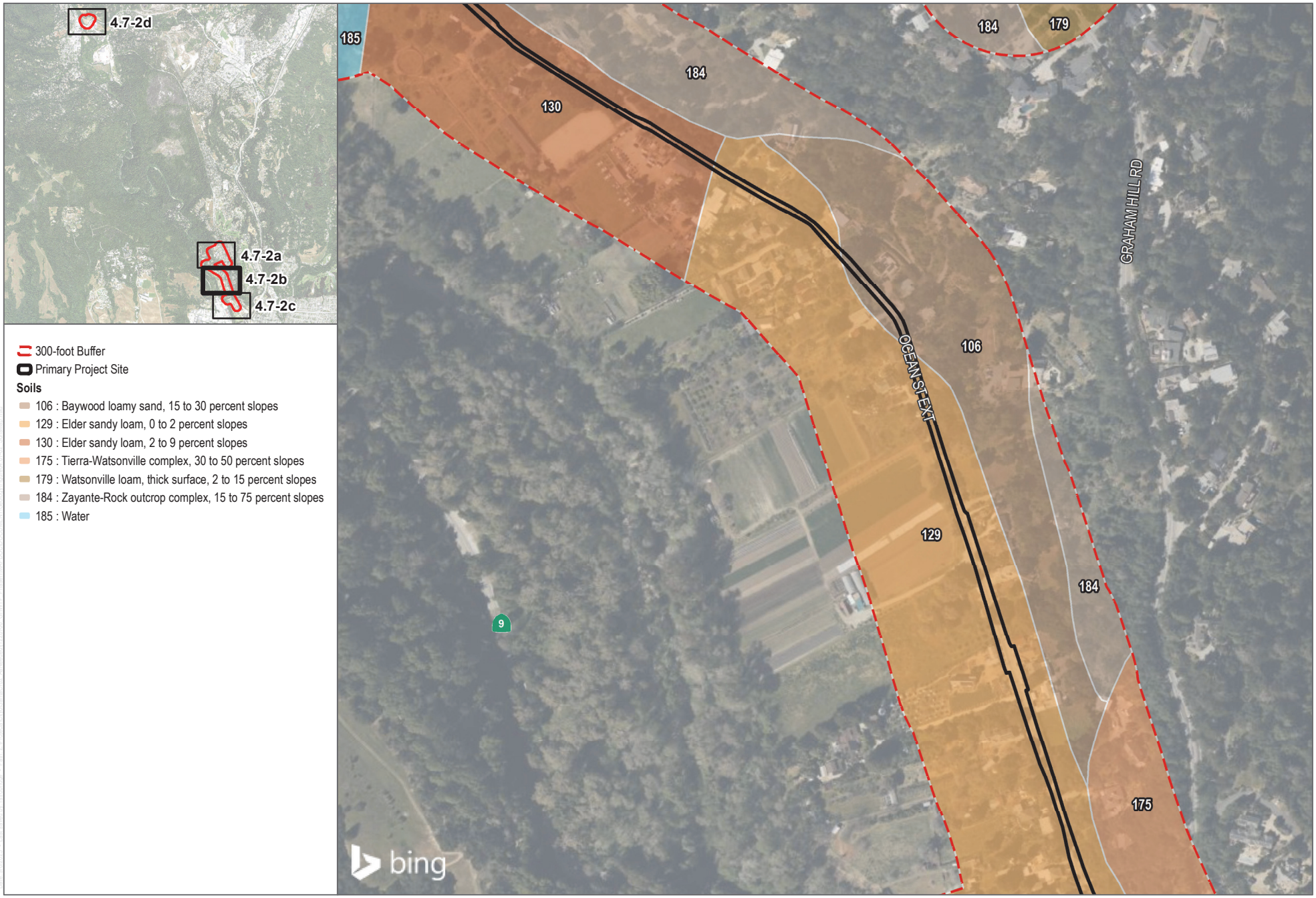

SOURCE: Bing Maps 2021, HDR 2020, USDA SSURGO

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0 175 350 Feet

FIGURE 4.7-2b

Soils Map - Alternate Sanitary Sewer Lateral Replacement Area

Graham Hill Water Treatment Plant Facility Improvements Project

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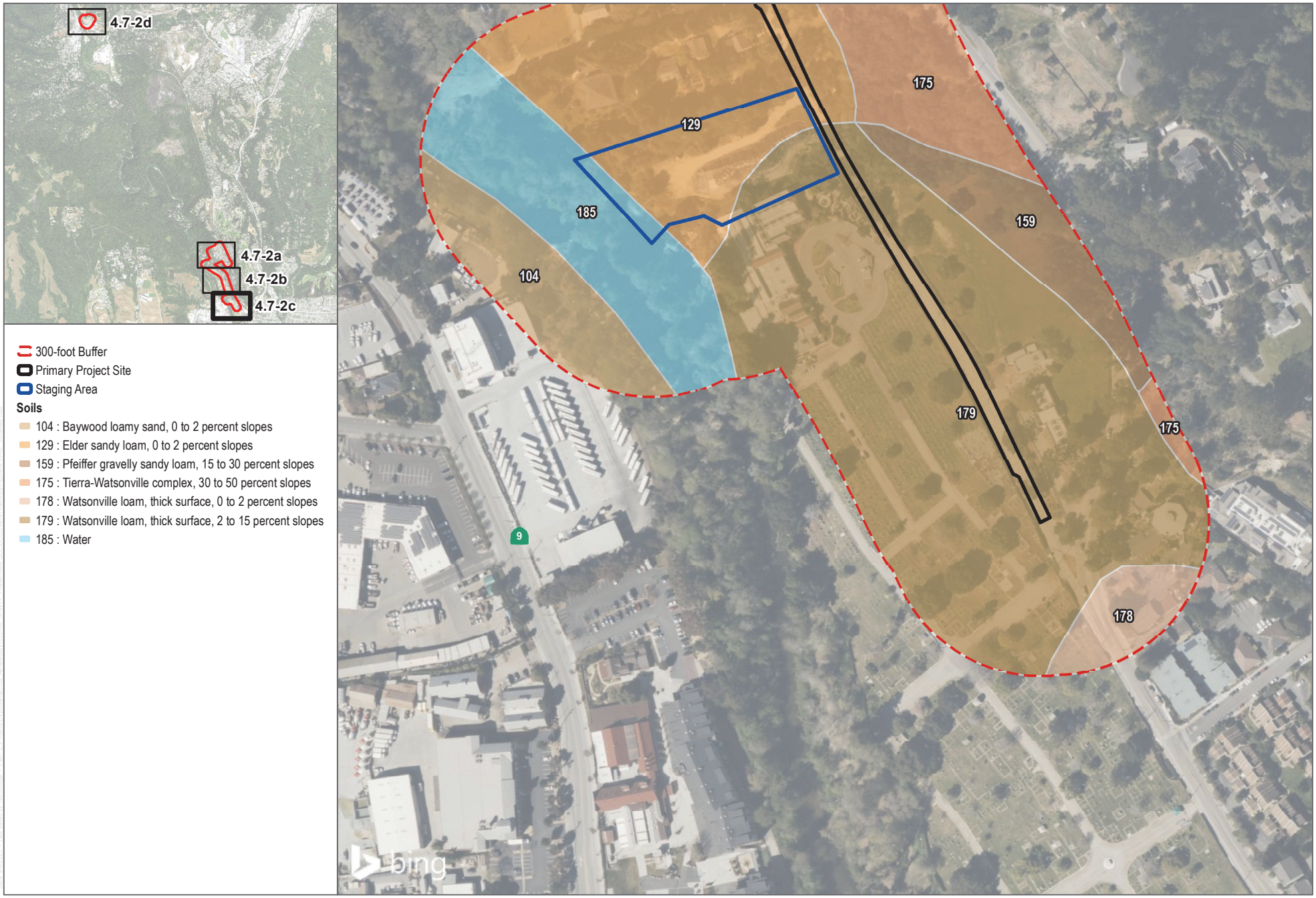

SOURCE: Bing Maps 2021, HDR 2020, USDA SSURGO

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FIGURE 4.7-2c

Soils Map - Ocean Street Extension Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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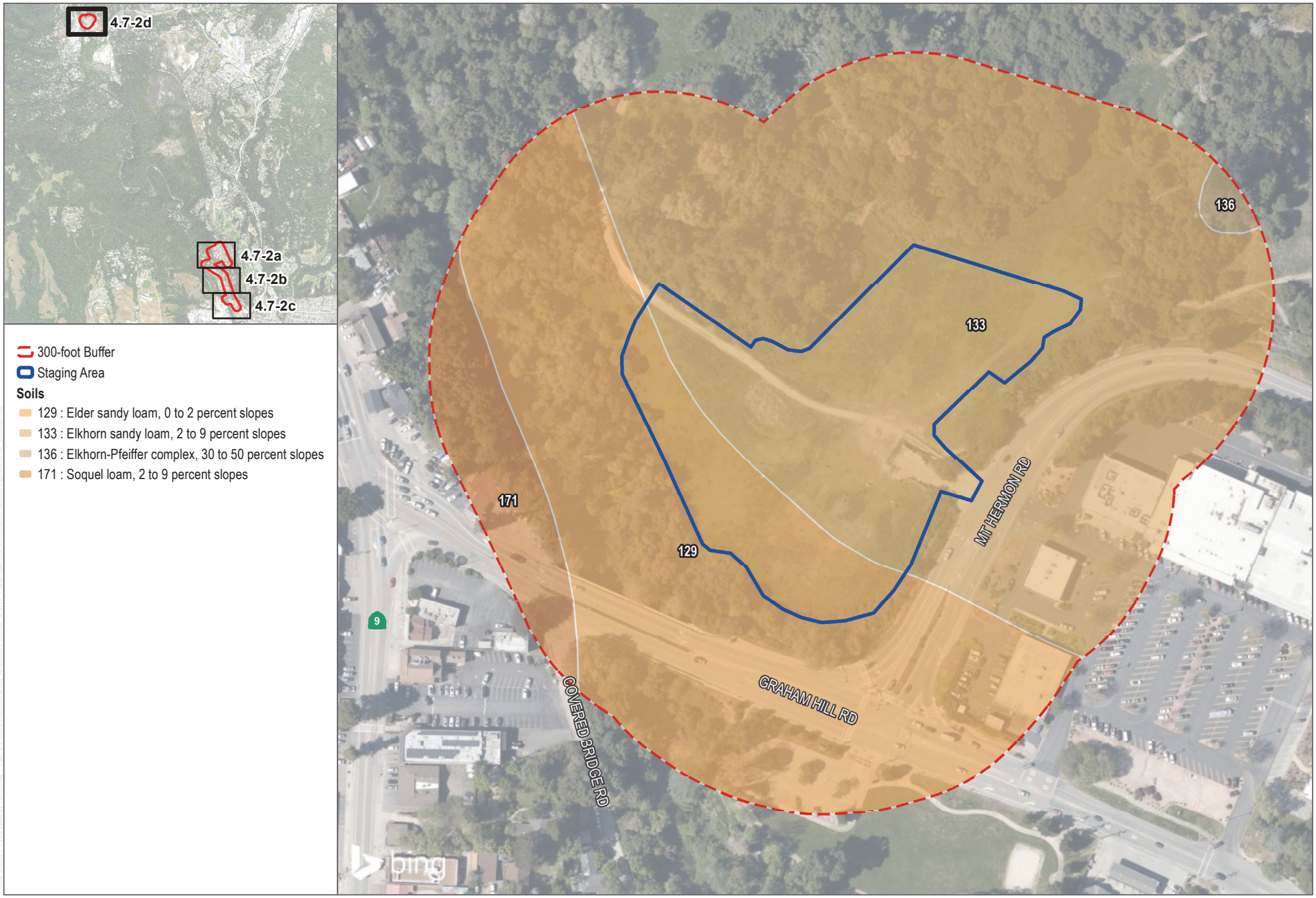

SOURCE: Bing Maps 2021, HDR 2020, USDA SSURGO

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0 100 200 Feet

FIGURE 4.7-2d

Soils Map - Mt. Hermon Road Staging Area

Graham Hill Water Treatment Plant Facility Improvements Project

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4.7.1.4 Slope Stability

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 project site is located in the USGS Santa Cruz and Felton quadrangle maps. Seismic Hazard Zone maps have not been completed for these quadrangles (CGS 2023). However, the County of Santa Cruz has created a GIS layer identifying potential landslide hazard areas, as shown on Figure 4.7-3 (County of Santa Cruz 2020).

GHWTP Parcel

The GHWTP parcel has not been identified as a potential landslide hazard area, as shown in Figure 4.7-3 (County of Santa Cruz 2020). The GHWTP parcel is located in the upper portion of a large west-facing slope adjacent to the San Lorenzo River. As previously discussed, the majority of the proposed building area on the GHWTP parcel is situated on an upper building pad, which varies in elevation from 310 to 313 feet. The hill where the existing wash water supply tank is located at the southwest portion of the site, and an unnamed slope in the southeastern portion of the site, rise to an elevation of about 330 feet. The top of the slope along the eastern perimeter of the site, bordering existing residential development, is at an elevation of 333 feet. The Concrete Tanks Project, as well as a smaller portion of the proposed building area, is located on a lower building pad, at an elevation of 265 to 270 feet. Slopes are inclined steeper than 1:1 (horizontal:vertical) in some areas of the GHWTP parcel. Soil nail walls were recently completed behind the Concrete Tanks Project on the lower pad and soldier pile walls have been constructed to support the access road to the lower pad (AECOM/W.M. Lyles Co. 2023).

The hilly terrain surrounding the GHWTP parcel is susceptible to landsliding, both seismically induced and non-seismically induced. Multiple small landslides have been mapped on the southwestern portion of the GHWTP parcel and surrounding area. The GHWTP parcel was graded to facilitate the construction of the existing water treatment infrastructure. Multiple small, surficial landslides within the southwestern GHWTP parcel boundary were mitigated with earthwork or infilled with riprap (AECOM/W.M. Lyles Co. 2023).

No unmapped slope instability features were observed during the October 2022 geologic reconnaissance; however, based on discussions with site personnel, previous surficial slumping has occurred at the northwestern portion of the GHWTP parcel. North of the sedimentation basins, weathered Santa Margarita sandstone was observed at the surface of the cut slope inclined steeper than 1:1 (horizontal:vertical), with benches approximately every 10 vertical feet.[1] No obvious instability issues were observed in this area; only a thin mantle of loose material from the overlying terrace deposits was found on the surface of the slope. No stream channels exist within the GHWTP parcel boundary. The potential for slope erosion exists along the western GHWTP parcel boundary (AECOM/W.M. Lyles Co. 2023).

Utility Corridor

The utility corridor has not been identified as a potential landslide hazard area, as shown in Figure 4.7-3 (County of Santa Cruz 2020). However, the utility corridor traverses a west-facing, steep to moderately steep slope; therefore, the potential for slope instability is present.

[1] These benches were installed as a repair to a slippage that occurred during storms in 2017. The repair area was regraded, terraced, seeded, and erosion control was installed.

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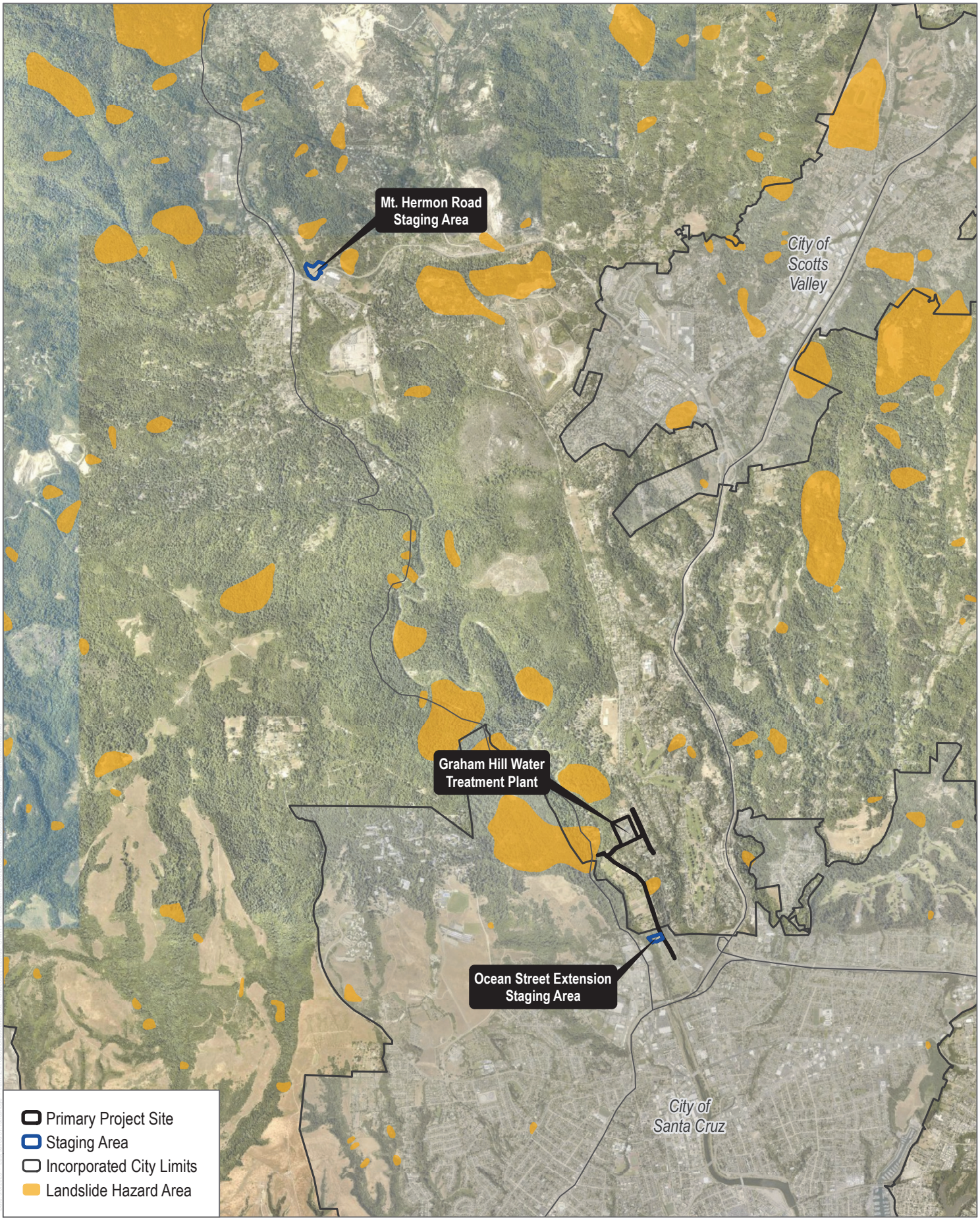

SOURCE: Bing Maps Accessed 2020, County of Santa Cruz 2020

DUDEK

0 2,200 4,400 Feet

FIGURE 4.7-3

Landslide Hazard Area Map

Graham Hill Water Treatment Plant Facility Improvements Project

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Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way has not been identified as a potential landslide hazard area, as shown in Figure 4.7-3 (County of Santa Cruz 2020). The topography along the Graham Hill Road right-of-way is relatively flat to gently sloping; therefore, the potential for slope instability is very low.

Alternate Sanitary Sewer Lateral Replacement Area

The northwest portion of the alternate sanitary sewer lateral replacement area, on the west-facing hillside adjacent to the San Lorenzo River, has been identified as a potential landslide hazard area (see Figure 4.7-3). In addition, another potential landslide hazard area has been identified upslope and immediately east of the central portion of the corridor (County of Santa Cruz 2020). The topography along the remainder of the alternative sanitary sewer lateral replacement area is relatively flat to gently sloping; therefore, the potential for slope instability is very low.

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area has not been identified as a potential landslide hazard area, as shown in Figure 4.7-3 (County of Santa Cruz 2020). The topography in the Mt. Hermon Road staging area is relatively flat to gently sloping; therefore, the potential for slope instability is very low.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area has not been identified as a potential landslide hazard area, as shown in Figure 4.7-3 (County of Santa Cruz 2020). The topography in the Ocean Street Extension staging area is relatively flat to gently sloping; therefore, the potential for slope instability is very low.

4.7.1.5 Subsidence

Subsidence occurs when a substantial 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 project site is not located in an area of historic or recent subsidence due to groundwater extraction, peat loss, or oil extraction (USGS 2023a).

4.7.1.6 Expansive Soils

Expansive soils are composed predominantly of clays that 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 various 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.

GHWTP Parcel

Laboratory testing of soils from the GHWTP parcel indicated moderate to high expansion potential of terrace deposit clays. The Santa Margarita sandstone, schist, and granodiorite are not high in clay content and therefore would not be susceptible to soil expansion (AECOM/W.M. Lyles Co. 2023).

Utility Corridor

The utility corridor is underlain by Mesozoic or Paleozoic metasedimentary schist and quartzite, as shown in Figure 4.7-1 (County of Santa Cruz 2020). These rock types are not high in clay content and therefore would not be susceptible to soil expansion (AECOM/W.M. Lyles Co. 2023).

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way is underlain by Pleistocene terrace deposits and Miocene-age Santa Margarita Formation sandstone, as shown in Figure 4.7-1 (County of Santa Cruz 2020). As indicated above, the terrace deposit clays have a moderate to high expansion potential, whereas the Santa Margarita Formation sandstone is not high in clay content and therefore would not be susceptible to soil expansion (AECOM/W.M. Lyles Co. 2023).

Alternate Sanitary Sewer Lateral Replacement Area

The alternate sanitary sewer lateral replacement area is underlain by Miocene-age Santa Margarita Formation sandstone, Mesozoic or Paleozoic metasedimentary schist and quartzite, and Holocene alluvial deposits (County of Santa Cruz 2020) that typically consist of relatively unconsolidated sand, silt, clay, and gravel, as shown in Figure 4.7-1. Although the sandstone and schist/quartzite are low in clay content and therefore not prone to soil expansion (AECOM/W.M. Lyles Co. 2023), any clay deposits in the alluvium may be prone to soil expansion.

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is underlain by Holocene alluvium (County of Santa Cruz 2020) that typically consists of sand, silt, clay, and gravel. Any clay deposits in the alluvium may be prone to soil expansion, as shown in Figure 4.7-1.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area is underlain by Miocene-age Santa Margarita Formation sandstone and Holocene alluvium, as shown in Figure 4.7-1 (County of Santa Cruz 2020). Although the sandstone is low in clay content and therefore not prone to soil expansion (AECOM/W.M. Lyles Co. 2023), any clay deposits in the alluvium may be prone to soil expansion.

4.7.1.7 Regional Seismicity and Seismic Hazards

The project site is located in a seismically active region of California, between two major Holocene-active faults, including the San Andreas Fault, located approximately 10 miles to the northeast, and the San Gregorio Fault, located approximately 10 miles to the southwest, as shown on Figure 4.7-4. 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 campus, approximately 4.5 miles from the project site, 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 (City of Santa Cruz 2012).

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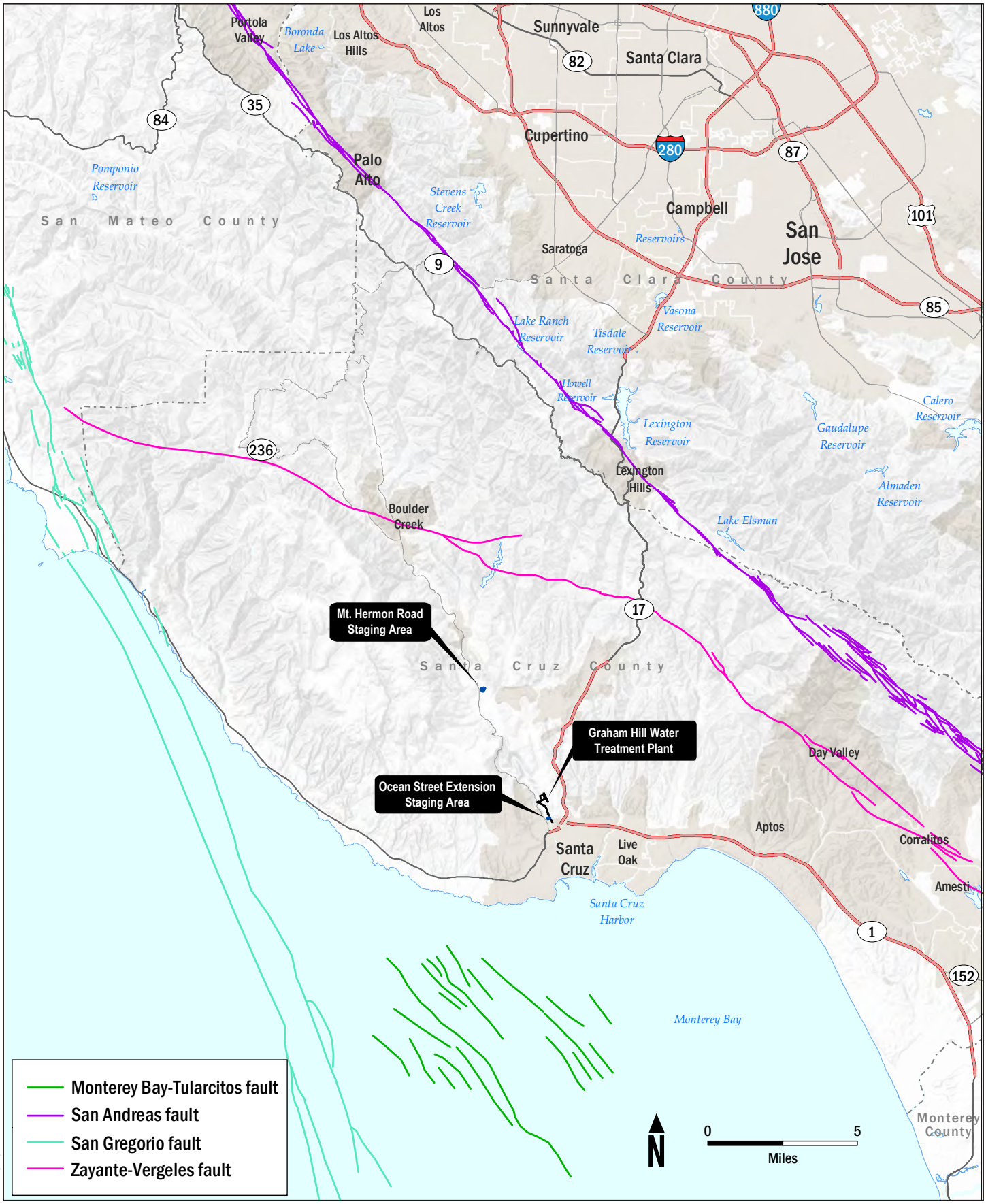

SOURCE: USGS 2020

FIGURE 4.7-4

Fault Map

Graham Hill Water Treatment Plant Facility Improvements Project

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Regional Faulting

As previously discussed, Santa Cruz County is located in a portion of California that is crossed by a number of faults. Distances to regional faults and maximum probable earthquake magnitudes are shown in Table 4.7-1.

Table 4.7-1. Regional Faults

Fault	Distance from Project Site (Miles)	Maximum Probable Earthquake Magnitude (Moment Magnitude)
San Gregorio	10	7.5
Zayante-Vergeles	8	7.5
Monterey Bay-Tularcitos	6	7.3
San Andreas	10	7.8

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 4.7.2, Regulatory Framework, the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (Alquist-Priolo Act) 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 site is located in the USGS 7.5-minute Santa Cruz and Felton quadrangle maps. As stated above, Seismic Hazard Zone maps have not been completed for these quadrangles (CGS 2023). The Alquist-Priolo Earthquake Fault Zone located closest to the project site is associated with the San Andreas Fault Zone, located approximately 10 miles northeast of the project site (CGS 2023; CDMG 1991). Therefore, the project site is not considered to be subject to fault rupture.

4.7.1.8 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 to 50 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. Lateral spreading is the lateral movement of unsupported sediments, such as on a hillside or temporary construction excavation, in areas prone to liquefaction.

The CGS has completed Seismic Hazard Zone maps, which include liquefaction zones, for select USGS quadrangle maps in California. As stated above, the project site is located in the USGS 7.5-minute Santa Cruz and Felton

quadrangle maps and Seismic Hazard Zone maps have not been completed for these quadrangles (CGS 2023). However, the County of Santa Cruz has created a GIS layer identifying potential liquefaction areas, as shown on Figure 4.7-5, Liquefaction Map (County of Santa Cruz 2020).

GHWTP Parcel

The GHWTP parcel is located in an area of low liquefaction potential, as shown on Figure 4.7-5 (County of Santa Cruz 2020). The Pleistocene terrace deposits on the eastern to southeastern edge of the site have a low liquefaction susceptibility. Based on soil and rock materials encountered in geotechnical borings on-site, as well as the depth to free groundwater, the potential for liquefaction is low to very low throughout the GHWTP site (AECOM/W.M. Lyles Co. 2023).

Utility Corridor

The utility corridor is located in an area of no liquefaction potential, as shown on Figure 4.7-5 (County of Santa Cruz 2020).

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way is located in an area of low liquefaction potential, as shown on Figure 4.7-5 (County of Santa Cruz 2020).

Alternate Sanitary Sewer Lateral Replacement Area

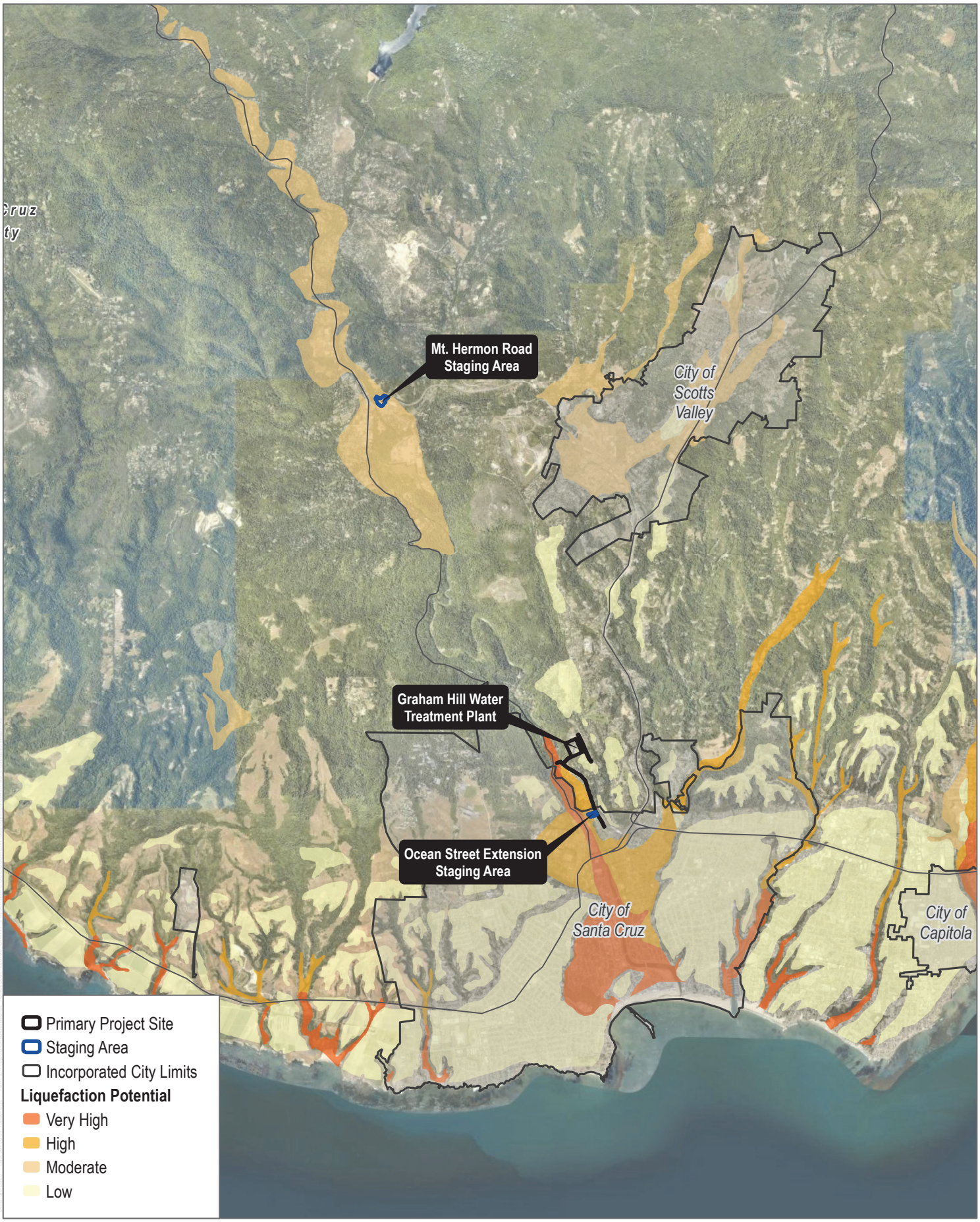
The Holocene alluvium underlying the northwest portion of the alternate sanitary sewer lateral replacement area, adjacent to the San Lorenzo River, is an area of very high liquefaction potential, as shown on Figure 4.7-5 (AECOM/W.M. Lyles Co. 2023). In addition, much of the remaining portion of the area is located along the eastern edge of an area of Holocene alluvium, which has a high liquefaction potential. The southern end of the corridor is located in an area of no liquefaction potential (County of Santa Cruz 2020).

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is underlain by Holocene alluvium, which is an area of high liquefaction potential, as shown on Figure 4.7-1 and Figure 4.7-5 (County of Santa Cruz 2020).

Ocean Street Extension Staging Area

The Ocean Street Extension staging area is underlain by Miocene-age Santa Margarita Formation sandstone, which is not conducive to liquefaction, as shown on Figure 4.7-1 and Figure 4.7-5 (County of Santa Cruz 2020).



SOURCE: Bing Maps Accessed 2020, County of Santa Cruz 2020

DUDEK

0 3,500 7,000 Feet

FIGURE 4.7-5

Liquefaction Map

Graham Hill Water Treatment Plant Facility Improvements Project

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4.7.1.9 Unique Geologic 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 within the project site.

4.7.1.10 Paleontological Resources

Paleontological resources are the remains or traces of plants and animals that are preserved in earth's crust, and per the Society of Vertebrate Paleontology ([SVP] 2010) guidelines, are older than written history or older than approximately 5,000 years. They are limited, nonrenewable resources of scientific and educational value and are afforded protection under state laws and regulations. Table 4.7-2, Paleontological Resource Sensitivity Criteria, provides definitions for high, undetermined, low, and no paleontological resource potential, or sensitivity, as set forth in and by the SVP Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.

Table 4.7-2. Paleontological Resource Sensitivity Criteria

Resource Sensitivity / Potential	Definition
High	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

Table 4.7-2. Paleontological Resource Sensitivity Criteria

Resource Sensitivity / Potential	Definition
Undetermined Potential	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist (see "definitions" section in this document) to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.
Low Potential	Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
No Potential	Some rock units have no potential to contain significant paleontological resources, for instance high–grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

Source: SVP 2010.

Natural History Museum of Los Angeles County Paleontological Resources Records Search

A paleontological resources records search was requested from the LACM for the nearby Newell Creek Pipeline project that intersects this project site and is underlain by the same geological units. The LACM reported five fossil localities from the Santa Margarita Formation near the project site. Fossil locality LACM IP (Invertebrate Paleontology) 22182 produced a fossil sand dollar (*Astrodapsis spatiosus*) from an unknown depth 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.

University of California Online Specimen Database Search

A review of the UCMP online specimen database indicated the museum holds two Pleistocene and three Santa Margarita Formation sandstone localities from Santa Cruz County. Pleistocene specimens include elk (*Cervus*) and miscellaneous vertebrates collected along State Route 129. Santa Margarita Formation sandstone localities include bony and cartilaginous fishes (Osteichthyes and *Isurus hastalis*), reptile (turtle), bird (*Morus lompocanus*), whale (*Nannocetus eremus*), and a skeleton of a sirenian (*Dusisiren jordani*). These specimens were collected near Delaveaga Park. *Dusisiren jordani* and *Nannocetus eremus* were discussed in the

scientific literature (Boessenecker 2008; Domning 1978; Kobayashi et al. 1995; Whitmore and Barnes 2008). Other Santa Margarita Formation localities include the Kaiser Olympia Quarry 2 and the Taylor Quarry. The Kaiser Olympia Quarry 2 produced fossil specimens of walrus (*Imagotaria downsi*) and *Dusisiren jordani*. The UCMP online specimen database search revealed no Holocene, Mesozoic, or Paleozoic fossil localities from Santa Cruz County.

GHWTP Parcel

The GHWTP parcel is underlain by Pleistocene terrace deposits, late Miocene Santa Margarita Formation sandstone, and metasedimentary schist and quartzite (see Figure 4.7-1). The geotechnical report prepared for the Proposed Project indicated the majority of the GHWTP parcel is underlain by artificial fill, minor landslide deposits, Holocene colluvium, Pleistocene terrace deposits, the Santa Margarita Formation sandstone, and schist. Artificial fill was encountered in geotechnical borings, ranging from 0 – 11 feet thick.

Given any paleontological resources contained within artificial fill and minor landslide deposits are not in situ, they are assigned low paleontological resources sensitivity. Holocene colluvium is generally too young to preserve paleontological resources on the surface and at shallow depths, and it is assigned low paleontological resources sensitivity. However, with depth, the paleontological resources sensitivity potentially increases to high if the sediments become old enough to preserve fossils or the Holocene alluvium is underlain by a geological unit with high paleontological resources sensitivity. Pleistocene terrace deposits and the Santa Margarita Formation sandstone have high paleontological resources sensitivity throughout their geographic and stratigraphic extent. Given metasedimentary schist and quartzite have no record of preserving paleontological resources due to the high temperatures and pressures required for their formation, they have no paleontological resources sensitivity,

Utility Corridor

The utility corridor is underlain by Mesozoic or Paleozoic metasedimentary schist and quartzite (see Figure 4.7-1). Given metasedimentary schist and quartzite have no record of preserving paleontological resources due to the high temperatures and pressures required for their formation, they have no paleontological resources sensitivity,

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way is underlain by Pleistocene terrace deposits and the late Miocene Santa Margarita Formation sandstone (see Figure 4.7-1). Pleistocene terrace deposits and the Santa Margarita Formation sandstone have high paleontological resources sensitivity throughout their geographic and stratigraphic extent.

Alternate Sanitary Sewer Lateral Replacement Area

The alternate sanitary sewer lateral replacement area is underlain by Holocene alluvial deposits, Miocene-age Santa Margarita Formation sandstone, and Mesozoic or Paleozoic metasedimentary schist and quartzite (see Figure 4.7-1). As indicated previously, Holocene alluvial deposits are assigned low paleontological resources sensitivity on the surface and at shallow depths that increases to high, where they can become old enough to preserve significant paleontological resources or are underlain by geological units with high paleontological resources sensitivity. The Santa Margarita Formation sandstone is assigned high paleontological resources sensitivity throughout its geographic and stratigraphic extent. Given metasedimentary schist and quartzite have no record of preserving paleontological resources due to the high temperatures and pressures required for their formation, they have no paleontological resources sensitivity,

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is underlain by Holocene alluvial deposits (see Figure 4.7-1). As indicated previously, Holocene alluvial deposits are assigned low paleontological resources sensitivity on the surface and at shallow depths that increases to high, where they can become old enough to preserve significant paleontological resources or are underlain by geological units with high paleontological resources sensitivity.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area is underlain by Holocene alluvial deposits and the Miocene Santa Margarita Formation sandstone (see Figure 4.7-1). As indicated previously, Holocene alluvial deposits are assigned low paleontological resources sensitivity on the surface and at shallow depths that increases to high, where they can become old enough to preserve significant paleontological resources or are underlain by geological units with high paleontological resources sensitivity. The Santa Margarita Formation sandstone is assigned high paleontological resources sensitivity throughout its geographic and stratigraphic extent.

4.7.2 Regulatory Framework

4.7.2.1 Federal

Federal regulations do not directly apply to geology and soils with respect to the Proposed Project. Nonetheless, installation of underground infrastructure/utility lines will comply with national industry standards specific to the type of utility (e.g., National Clay Pipe Institute for sewers, American Water Works Association for water lines), and the discharge of contaminants must be controlled through the National Pollutant Discharge Elimination System (NPDES) permitting program for management of construction and municipal stormwater runoff. These standards contain specifications for installation, design, and maintenance to reflect site-specific geologic and soils conditions.

4.7.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (California 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. Based on the Alquist-Priolo Act, 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 Section 2690 et seq.), passed by the California 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 [CCR] Part 2) (the California Building Code), which is updated every 3 years. These regulations apply to public and private buildings in the state. 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 2022 California Building Code, effective January 1, 2023, is based on the current (2021) 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 (Cal/OSHA) regulations (Title 8 of the CCR). 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 and trenching.

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 site 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 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,

preservation, and so forth. 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.

4.7.2.3 Local

The Proposed Project relates primarily to production, treatment, storage, and transmission of water supplies, and therefore, those facilities are generally legally exempt under California Government Code Section 53091 (d) and (e) from the City of Santa Cruz and County of Santa Cruz building and zoning ordinances. However, related facilities that serve functions other than those listed above, such as the Proposed Project's upgraded Operations and Filter Building located within City limits, remain subject to the City's zoning and building requirements. Local requirements related to geology and soils are typically consistent with State requirements identified in the prior section that would be implemented for the Proposed Project, where relevant.

4.7.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of 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.

4.7.3.1 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 2022 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 waste water disposal systems where sewers are not available for the disposal of waste water.
F. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.7.3.2 Analytical Methods

Potential impacts related to geology and soils were identified based on consideration of the Proposed Project characteristics, the location and characteristics of the project site, and applicable requirements and regulations. Specifically, 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 CCR) 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. 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 regulations, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. However, there are no City standard construction practices applicable to geology and soils that are part of the Proposed Project. Standard construction practices related to erosion control are considered in Section 4.10, Hydrology and Water Quality.

4.7.3.3 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.

- **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 site is not located within an Alquist-Priolo Earthquake Fault Zone or underlain by any Holocene-active or pre-Holocene faults. Therefore, the Proposed Project would have no impacts related to earthquake fault rupture.
- **Loss of Topsoil (Significance Threshold B).** The Proposed Project consists of installation of upgrades to the GHWTP and related infrastructure upgrades within developed areas. Construction would not result in loss of topsoil as most of the grading and excavation would occur in previously disturbed areas. Soils removed during construction would be replaced on site with engineered fill. Thus, the Proposed Project would not result in loss of topsoil. Potential erosion during construction is addressed in Section 4.10, Hydrology and Water Quality.
- **Septic Tanks/Alternative Wastewater Disposal (Significance Threshold E).** The Proposed Project would continue to be connected to sewer facilities for disposal of treatment residuals and staff related wastewater. 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 4.7.1, Existing Conditions, the project site is located in a seismically active region of California between two major Holocene-active faults: the San Andreas Fault, located approximately 10 miles to the northeast, and the San Gregorio Fault, located approximately 10 miles to the southwest (see Figure 4.7-4). In addition, the project site is located approximately 8 miles southwest of the Zayante-Vergeles Fault that is mapped by the USGS as a late Pleistocene to possibly Holocene fault (past 15,000 years). All components of the Proposed Project would be susceptible to strong seismic shaking as a result of an earthquake on these nearby faults or other regional faults.

The GHWTP parcel, utility corridor, Graham Hill Road right-of-way, and Ocean Street Extension staging area are not located in areas susceptible to liquefaction. While the Mt. Hermon Road staging area is underlain by Holocene alluvium, which is an area of high liquefaction potential, no construction would occur within this staging area. However, as shown in Figure 4.7-5, the Holocene alluvium underlying the northwest portion of the alternate sanitary sewer lateral replacement area, adjacent to the San Lorenzo River, is an area of very high liquefaction potential. Loose, unconsolidated alluvial materials within the San Lorenzo River bed may be susceptible to liquefaction and associated lateral spreading in the event of strong seismically induced ground shaking. Much of the remaining portion of the corridor is located along the eastern edge of an area of high liquefaction potential. In the absence of proper geotechnical engineering, proposed new/upgraded structures and infrastructure improvements in areas of potential liquefaction along the alternate sanitary sewer lateral replacement area would be susceptible to damage in the event of a strong earthquake.

Compaction settlement, or seismic densification, occurs when loose granular soils above the water table increase in density as a result of earthquake shaking. The soil densification can result in differential settlement because of variations in soil composition, thickness, and initial density. Granular fills encountered in the geotechnical borings at the GHWTP appeared to be dense during hand auger advancement. This field interpretation plus the thin extent of fill encountered (less than 5 feet thick) indicate a low possibility the artificial fill may be susceptible to cyclic densification during strong ground shaking, resulting in minimal compaction settlement in the areas investigated. However, seismic compaction settlement on the order of about 0.5 inch for granular artificial fill, terrace deposits, and colluvial layers may occur as a result of strong seismically induced ground shaking (AECOM/W.M. Lyles Co. 2023). In the absence of proper geotechnical engineering, 0.5 inch of settlement could result in damage to proposed new/upgraded structures and infrastructure improvements at the GHWTP. Similarly, differential settlement could occur in unconsolidated sediments in proposed areas of infrastructure improvements along the utility corridor and alternate sanitary sewer lateral replacement area during severe seismically induced ground shaking.

However, as required by the 2022 California Building Code, the GHWTP upgrades, including new/upgraded buildings and infrastructure improvements, would be constructed in accordance with the recommendations of the project-specific geotechnical report (AECOM/W.M. Lyles Co. 2023). Provided the geotechnical recommendations are incorporated in the project design and during construction, the proposed new buildings, tanks, and containment structures can be supported on existing foundation systems, shallow footings, or mat slab–type foundations, as were used in the original plant design. The GHWTP and proposed infrastructure improvements would be constructed

in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Areas susceptible to liquefaction, lateral spreading, and differential compaction would be engineered to minimize seismic related impacts. 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. Therefore, the impact of the Proposed Project related to seismic hazards would be less than significant impact.

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	Landslides (Significance Threshold A-iv). The Proposed Project would not cause potential substantial adverse effects involving landslides, including the risk of loss, injury, or death. ***(Less than Significant)***

The hilly terrain surrounding the GHWTP parcel is susceptible to landsliding, both seismically induced and non-seismically induced. With the exception of previous surficial slumping at the northeastern portion of the GHWTP parcel, north of the sedimentation basins, which has been remediated through slope benching, no landslides have been identified in the upper building pad at the GHWTP parcel. Based on a project-specific geotechnical investigation (AECOM/W.M. Lyles Co. 2023), multiple landslides were previously identified on the southwestern portion of the GHWTP parcel. These small landslides were identified on the slopes topographically above and below the Concrete Tanks Project on the lower building pad but have been mitigated with earthwork or infilled with riprap. Soil nail walls were completed behind the Concrete Tanks Project and soldier pile walls have been constructed to support the access road to the lower pad. However, strong ground shaking as a result of a large earthquake on a nearby or regional fault could trigger localized landsliding (AECOM/W.M. Lyles Co. 2023).

The utility corridor traverses a west-facing, steep to moderately steep slope; therefore, the potential for slope instability is present. As illustrated in Figure 4.7-3, the northwest portion of the utility corridor, on the west-facing hillside adjacent to the San Lorenzo River, has been identified as a potential landslide hazard area. The topography along the remainder of the project site, including the alternate sanitary sewer lateral replacement area, the Graham Hill Road right-of-way, and staging areas are relatively flat to gently sloping; therefore, the potential for slope instability is low in these areas.

Given the hilly terrain at the GHWTP parcel and surrounding vicinity, and the presence of small previously remediated landslides on the slopes below and above the lower building pad, the potential for landslides in areas of proposed construction cannot be ruled out (AECOM/W.M. Lyles Co. 2023). In addition, in the absence of proper geotechnical engineering and slope construction, excavations into existing hillsides for creation of cut slopes could result in slope instability and failure. However, the GHWTP and storm drain improvements in the utility corridor would be constructed in accordance with the recommendations of the project-specific geotechnical report (AECOM/W.M. Lyles Co. 2023), which include recommendations pertaining to seismic and non-seismic related slope stability, as described below. The GHWTP and all other project infrastructure improvements would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist.

Based on AECOM/W.M. Lyles' review of the historic site and subsurface information, findings from their geologic reconnaissance and bedrock shear wave velocity survey, as well as conditions encountered in the project borings

drilled for the current study, the proposed new buildings, tanks, and containment structures can be supported on existing foundation systems, shallow footings, or mat slab–type foundations, as were used in the original plant design. Facility foundation system design and construction would be completed in accordance with the recommendations of the project-specific geotechnical report.

Areas susceptible to slope failure would be engineered to minimize unstable slope impacts. Cuts into Santa Margarita sandstone no steeper than 1:1 (horizontal:vertical) are expected to be stable (AECOM/W.M. Lyles 2023), provided that benches are provided every 10 vertical feet, and with appropriate surface treatment to protect from erosion. Up to 25 feet of terrace deposits were revealed in historic Boring B-7, advanced adjacent to the proposed Solids Dewatering Building and mapped at the surface by Group Delta on the hill where the existing wash water supply tank is located and eastward. Based on recommendations in the geotechnical report, cuts in these slopes would not exceed an inclination of 1.5:1, for a maximum height of 20 feet. The inclination of taller permanent cut slopes and all fill slopes would be no steeper than 2:1. Cut slopes created during grading and construction would be monitored by a California Certified Engineering Geologist during construction for signs of potentially unstable conditions (AECOM/W.M. Lyles 2023).

In addition, temporary excavations created during demolition and construction of new facilities would result in temporary vertical or steep slopes pending completion of final site grading. These temporary excavations would likely include relatively narrow trenches with vertical walls, such as for utility/pipeline removal and new construction, or larger open excavations with temporary steep slopes. Vertical slopes would require shoring. Temporary steep slopes would typically be created at a gradient of 0.75:1 to prevent caving/failure. In the absence of proper shoring and/or temporary slope construction, trench sidewalls and temporary slopes could collapse, resulting in risk on-site personnel. However, temporary excavations would be completed in accordance with Cal/OSHA that has responsibility for implementing federal rules relevant to worker safety, including slope protection during construction excavations. Cal/OSHA's requirements are more restrictive and protective than federal OSHA standards. Title 8 of the CCR, Chapter 4, Division of Industrial Safety, covers requirements for excavation and trenching operations, as well as safety standards whenever employment exists in connection with removal or wrecking of any fixed structure or its part. Compliance with Cal/OSHA regulations would prevent caving of temporary trench walls and failure of temporary steep slopes during facility/infrastructure removals and new construction activities.

Overall, with the implementation of project-specific geotechnical recommendations pertaining to seismic and non-seismic related slope stability and compliance with Cal/OSHA regulations, the impact of the Proposed Project related to landslides and slope stability hazards would be less than significant.

Mitigation Measures

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

Impact GEO-3	Unstable Geologic Unit or Soils (Significance Threshold C). The Proposed Project would not 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)***

As described in Impact GEO-1 and Impact GEO-2, the impacts of the Proposed Project related to seismic hazards (including liquefaction and lateral spreading), and landslides would be less than significant. As discussed in Section 4.7.1, Existing Conditions, the project site is not located in an area prone to subsidence due to groundwater

withdrawal, oil and gas extraction, or peat deposits. Therefore, ground settling and collapse associated with subsidence is not expected in association with the Proposed Project.

Fills associated with original site grading, as well as native localized colluvium and/or terrace deposits, vary in strength, composition, and compressibility. These materials, if left in place below shallow foundations, could experience total and differential settlements (AECOM/W.M. Lyles Co. 2023), resulting in damage to new and upgraded buildings and infrastructure. However, the proposed facility improvements at the GHWTP would be constructed in accordance with the recommendations of the project-specific geotechnical report (AECOM/W.M. Lyles Co. 2023) that include over-excavation and replacement with a minimum 3-foot-thick section of engineered fill below at-grade footings, mat foundations, slab-on-grade floors, and grade beams, thus minimizing the potential for seismically-induced or non-seismically-induced differential settlement or soil collapse. The required depth of over-excavation could potentially be increased or reduced depending on conditions revealed during grading.

The GHWTP and all other project infrastructure improvements would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Areas susceptible to differential settlement and compressible/collapsible soils would be engineered to minimize unstable soil related impacts. In addition, construction and operation of Proposed Project facilities would not increase the potential for unstable soils or geologic materials to occur. Therefore, the impact of the Proposed Project related to unstable geologic units or soils would be less than significant impacts.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to unstable geologic units or soils, and therefore, no mitigation measures are required.

Impact GEO-4	Expansive Soils (Significance Threshold D). The Proposed Project would potentially be located on expansive soil, as defined in the 2022 California Building Code, but would not create substantial direct or indirect risks to life or property. ***(Less than Significant)***

Laboratory testing of soils from the GHWTP parcel indicated moderate to high expansion potential of terrace deposit clays. The Graham Hill Road right-of-way is partly underlain by Pleistocene terrace deposits that have clays with moderate to high expansion potential; however, no construction would occur in the right-of-way. The Mt. Hermon Road staging area is underlain by Holocene alluvium; however, no construction would occur at the staging area.

The Proposed Project infrastructure improvements would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Areas susceptible to soil expansion would be engineered to minimize expansive soil related impacts. Expansive soils are typically addressed by overexcavation of the expansive clays and replacement with sandy, non-expansive soils beneath foundations, or use of post-tension concrete slabs. As a result, the Proposed Project would not create substantial direct or indirect risks to life or property related to expansive soils and impacts would be less than significant.

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-5	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. ***(Potentially Significant)***

As discussed in Section 4.7.1, Existing Conditions, the project site is underlain by geological units ranging from recent to the Paleozoic Era. The artificial fill encountered from 0 to 5 feet bgs on the GHWTP parcel during the geotechnical investigation and schist and quartzite have no paleontological resources sensitivity. Holocene alluvial or colluvial deposits have low paleontological resources sensitivity that potentially increases with depth. Pleistocene terrace deposits (ranging from 1.5 to 4 feet bgs) and the Santa Margarita Formation sandstone (ranging from 1 to 35.5 feet bgs) have high paleontological resources sensitivity and are mapped within the GHWTP parcel, the Graham Hill Road right-of-way, alternate sanitary sewer lateral replacement area (the Santa Margarita Formation sandstone only), the Mt. Hermon staging area and Ocean Street Extension staging area (the Santa Margarita Formation sandstone only), but not the utility corridor. Given the proximity of past fossil discoveries in the surrounding area within Pleistocene deposits and the Santa Margarita Formation sandstone, most of the project site, except the utility corridor, is highly sensitive for supporting paleontological resources below the depth of artificial fill and Holocene alluvial or colluvial deposits.

No paleontological resources were identified within the project site as a result of the UCMP specimen database research or desktop geological and paleontological review. In addition, the project site is not anticipated to be underlain by unique geologic features. If intact paleontological resources are located on site, substantial ground-disturbing activities associated with construction of the Proposed Project, such as grading during site preparation, trenching for utilities, and large diameter drilling (greater than two feet) below the depth of artificial fill, have the potential to result in disturbance to paleontological resources or sites. Such substantial ground-disturbing activities are anticipated at the GHWTP parcel and along the alternate sanitary sewer lateral replacement area with construction of the Proposed Project, but not along the Graham Hill right-of-way. Use of the two staging areas is not anticipated to result in such substantial ground-disturbing activities. Therefore, disturbance of paleontological resources during construction of the GHWTP and the alternate sanitary sewer replacement portions of the Proposed Project would result in potentially significant impacts.

Implementation of Mitigation Measure (MM) GEO-1 would avoid directly or indirectly destroying a unique paleontological resource by requiring: preparation and implementation of a Paleontological Resources Impact Mitigation Program (PRIMP) if known or identified resources are present on the site, or if the site is determined to have high paleontological sensitivity; and implementation of standard paleontological clauses in construction contracts at sites with known resources or with high sensitivity for such resources, which require paleontological resource sensitivity training for workers prior to conducting earth disturbance activities and procedures to follow in the event that paleontological resources are unearthed during grading. Specifically, the PRIMP and the paleontological clauses in construction contracts shall require that collection and documentation of identified fossils occurs before construction is initiated for a known find or before construction is resumed for a find discovered during construction, thereby avoiding complete destruction of the find. Therefore, with the implementation of this mitigation measure, the impact of Proposed Project related to paleontological resources would be reduced to less than significant.

Mitigation Measures

Implementation of the following mitigation measure would reduce the potentially significant impact related to paleontological resources to less than significant, as described above.

MM GEO-1: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring (applies to the GHWTP Parcel and the Alternate Sanitary Sewer Lateral Replacement Area). Prior to commencement of any ground disturbance below artificial fill and Holocene alluvial or colluvial deposits with the potential to impact Pleistocene terrace deposits or the Santa Margarita Formation sandstone within the project site, the City shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (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. A qualified paleontologist shall attend a preconstruction meeting and a qualified paleontological monitor shall be on site during ground-disturbing activities below fill and Holocene alluvial and/or colluvial deposits. where there is the potential to impact Pleistocene terrace deposits or the Santa Margarita Formation sandstone. 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 or an appropriately sized buffer as determined by the qualified paleontologist. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

4.7.3.4 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 where relevant to this topic. The geographic area of analysis for cumulative impacts related to geology and soils is generally the vicinity of the project site and therefore only cumulative projects located in the vicinity of the project site are considered in the analysis herein.

The Proposed Project would not contribute to cumulative impacts related to earthquake fault rupture (Significance Threshold A-i), loss of topsoil (Significance Threshold B) 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 4.10, Hydrology and Water Quality.

Impact GEO-6	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 site include the Water Capital Investment Program projects, Santa Cruz Water Rights Project, the Conjunctive Use Plan for the San Lorenzo River Watershed, the Highway 9/San Lorenzo Valley Complete Streets Corridor Plan, the Quail Hollow Road at Zayante Creek Bridge Replacement, and the Quail Hollow Ranch County Park Master Plan Amendment. Each of these cumulative projects would be subject to County or City approval; such 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 support 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, if required for a given project. As described in the analysis above, the Proposed Project impacts would be localized and would not result in construction (including grading/excavation) or design features that 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 a significant cumulative impact related to geological hazards.

Impact GEO-7	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 Proposed Project or other 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. Furthermore, MM GEO-1 provided in this analysis is prescribed to preserve significant paleontological resources uncovered during project excavations by properly analyzing and salvaging by the on-site paleontological monitor. 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 to paleontological resources.

4.7.4 References

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4.8 Greenhouse Gas Emissions

This section describes the existing greenhouse gas (GHG) conditions, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on GHG modeling 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 C.

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. One public comment was received from a neighboring resident that pertained to GHGs. The letter requested that solar power and battery storage be incorporated into the Proposed Project.

4.8.1 Existing Conditions

This section provides an overview of climate change, GHGs, and existing GHG inventories.

4.8.1.1 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 (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 the 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 (EPA 2017).

The greenhouse effect is the trapping and buildup of heat in the atmosphere near the Earth's surface (troposphere). The greenhouse effect traps heat in the troposphere through a threefold process, as follows: short-wave radiation emitted by the Sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and 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 (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.

4.8.1.2 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 (NF_3) (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).

[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 Fourth Assessment Report (IPCC 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 2017).

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. SF6 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:** NF_3 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 ($PM_{2.5}$) that 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.

4.8.1.3 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 2022.1) 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).

4.8.1.4 Greenhouse Gas Inventories and Climate Change Conditions

Contributions of Greenhouse Gas Emissions

Global Inventory

Anthropogenic GHG emissions worldwide in 2020 (the most recent year for which data is available) totaled approximately 49,800 million metric tons (MMT) of CO_2e, excluding land use change and forestry (PBL 2022). The top six GHG emitters include China, the United States, the Russian Federation, India, Japan, and the European

Union, accounted for approximately 60% of the total global emissions, or approximately 30,270 MMT CO_2e (PBL 2022). Table 4.8-1 presents the top GHG-emissions-producing countries and political entities.

Table 4.8-1. Six Top GHG Producer Countries and Political Entities

Emitting Countries	2020 GHG Emissions (MMT CO_2e)[a]
China	14,300
United States	5,640
European Union	3,440
India	3,520
Russian Federation	2,210
Japan	1,160
Total	**30,270**

Source: PBL 2022.
Notes: MMT CO_2e = million metric tons of carbon dioxide equivalent.
[a] Column may not add due to rounding.

National Inventory

Per the U.S. Environmental Protection Agency (EPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 to 2020 (EPA 2022), total United States GHG emissions were approximately 5,981.4 MMT CO_2e in 2020 (EPA 2022). The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 94.7% of total GHG emissions (4,715 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 87.2% of CO_2 emissions in 2020 (4,342.7 MMT CO_2e). Total U.S. emissions have decreased by 7.3% from 1990 to 2020, down from a high of 15.7% above 1990 levels in 2007. Emissions decreased from 2019 to 2020 by 9.0% (590.4 MMT CO_2e.). Net emissions (i.e., including sinks) were 5,222.4 MMT CO_2e in 2020. Overall, net emissions decreased 10.6% percent from 2019 to 2020 and decreased 21.4 percent from 2005 levels. The sharp decline in emissions from 2019 to 2020 is largely due to the impacts of the coronavirus (COVID-19) pandemic on travel and economic activity; however, the decline also reflects the combined impacts of long-term trends in many factors, including population, economic growth, energy markets, technological changes including energy efficiency, and the carbon intensity of energy fuel choices. Between 2019 and 2020, the decrease in total GHG emissions was driven largely by a 10.5% decrease in CO_2 emissions from fossil fuel combustion, including a 13.3% decrease in transportation sector emissions from less travel due to the COVID-19 pandemic and a 10.4% decrease in the electric power sector. The decrease in electric power sector emissions was due to a decrease in electricity demand of 2.5% since 2019 and also reflects the continued shift from coal to less carbon intensive natural gas and renewables (EPA 2022).

State Inventory

According to California's 2000–2020 GHG emissions inventory (2022 edition), California emitted approximately 369.2 MMT CO_2e in 2020, including emissions resulting from out-of-state electrical generation (CARB 2022a). 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 4.8-2 presents California GHG emission source categories and their relative contributions to the emissions inventory in 2020.

Table 4.8-2. GHG Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total*
Transportation	136.60	37%
Industrial uses	73.84	20%
Electricity generation[a]	59.07	16%
Residential and commercial uses	36.92	10%
Agriculture and Forestry	33.22	9%
High GWP substances	22.15	6%
Recycling and waste	7.38	2%
Totals	**369.2**	**100%**

Source: CARB 2022a.
Notes: GHG = greenhouse gas; GWP = global warming potential; MMT CO_2e = million metric tons of carbon dioxide equivalent. Emissions reflect 2020 California GHG inventory.
Totals may not sum due to rounding.
[a] Includes emissions associated with imported electricity, which account for 18.46 MMT CO_2e.

Per capita GHG emissions in California have dropped from a 2001 peak of 13.8 MT per person to 9.3 MT per person in 2020, a 33% decrease. In 2016, statewide GHG emissions dropped below the 2020 GHG limit of 431 MMT CO2e and have remained below that level since that time (CARB 2022a).

Local Inventory

The City of Santa Cruz (City) developed a GHG inventory for year 2019 as part of its *2030 Climate Action Plan* (CAP) (City of Santa Cruz 2022), with citywide GHG emissions estimated at 274,584 MT CO_2e. Table 4.8-3 details the sectors that comprise the estimated GHG emissions in the City.

Table 4.8-3. GHG Emissions Sources in the City of Santa Cruz

Source Category	Annual GHG Emissions (MT CO_2e)	Percent of Total
Transportation and mobile services	188,930	69%
Residential energy	42,718	16%
Commercial energy	23,206	8%
Solid waste	18,976	7%
Water and wastewater	754	0%
Totals	**274,584**	**100%**

Source: City of Santa Cruz 2022.
Notes: GHG = greenhouse gas; GWP = global warming potential; MT CO_2e = metric tons of carbon dioxide equivalent.
The "Percent of Total" for "Water and Wastewater" is listed at 0% based on 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 that 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).

The California Natural Resources Agency (CNRA) has released four California Climate Change Assessments (in 2006, 2009, 2012, and 2018) that 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 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.
- 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.

4.8.2 Regulatory Framework

4.8.2.1 Federal

Massachusetts v. U.S. Environmental Protection Agency

On April 2, 2007, in *Massachusetts v. EPA*, the U.S. Supreme Court ruled that CO_2 was a pollutant and 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 making these decisions, the EPA administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The elevated concentrations of GHGs—CO2, CH4, N2O, hydrofluorocarbons, perfluorocarbons, and SF6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."

- The combined emissions of GHGs—CO_2, CH_4, N_2O, and hydrofluorocarbons—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as 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.

Federal Vehicle Standards

In 2007, in response to the *Massachusetts v. EPA* U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order (EO) 13432 directing 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 National Highway Traffic Safety Administration (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 FR 25324–25728).

In 2019, the EPA and NHTSA published the Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program (SAFE-1) (84 FR 51310) that revoked California's authority to set its own GHG emissions standards and set zero-emission vehicle (ZEV) mandates in California. In March 2020, Part Two was issued that set CO_2 emissions standards and Corporate Average Fuel Economy (CAFE) standards for passenger vehicles and light-duty trucks for model years 2021 through 2026.

On December 21, 2021, NHTSA finalized the CAFE Preemption rulemaking to withdraw its portions of the Part One Rule. The final rule concluded that the Part One Rule overstepped the agency's legal authority and established overly broad prohibitions that did not account for a variety of important state and local interests. Then, in March 2022, NHTSA established new fuel economy standards that would require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8% annually for model years 2024 and 2025, and 10% annually for model year 2026.

4.8.2.2 State

The statewide GHG emissions regulatory framework is summarized in this subsection by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, water, solid waste, 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) identified 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 identified 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.

Assembly Bill 32

In furtherance of the goals identified 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). 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.

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 Climate Change Scoping Plan (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.

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 support 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, 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.

Executive Order B-55-18

EO B-55-18 (September 2018) identified a 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 facilitate that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Assembly Bill 1279

The Legislature enacted AB 1279, the California Climate Crisis Act, in September 2022. The bill declares the policy of the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter. Additionally, the bill requires that by 2045, statewide anthropogenic GHG emissions be reduced to at least 85% below 1990 levels.

Although AB 1279 establishes an overall policy to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, recognizing the need to implement CO_2 removal and carbon capture, utilization and storage technologies, the Legislature established a specific target of 85% below 1990 levels by 2045 for anthropogenic GHG emissions. Therefore, the net zero target does not directly apply to development projects, but the 2045 target of 85% below 1990 levels represents the reductions required to contribute to accomplishing the State's overall net zero policy.

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) (CARB 2008). In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (2014 Scoping Plan) 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 EO S-3-05 and EO B-16-2012 (CARB 2014). The 2014 Scoping Plan concluded that California was on track to meet the 2020 target, but recommended that a 2030 mid-term GHG reduction target be established to support a continuum of action to reduce emissions. The 2017 Climate Change Scoping Plan Update (2017 Scoping Plan) (CARB 2017) built on the successful framework established in the initial Scoping Plan and 2014 Scoping Plan, while identifying new technologically feasible and cost-effective strategies to serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond.

The Final 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) was issued on November 16, 2022 (CARB 2022b) and approved on December 15, 2022. The 2022 Scoping Plan lays out a path not just to carbon neutrality by 2045 but also to the 2030 GHG emissions reduction target. The 2022 Scoping Plan analyzed four scenarios, with the objective of informing the most viable path to remain on track to achieve the 2030 GHG reduction target. The scenario modeling indicates that, if the plan described in the Proposed Scenario is fully implemented, and done so on schedule, the State would cut GHG emissions by 85% below 1990 levels, result in a 71% reduction in smog-forming air pollution, reduce fossil fuel consumption by 94%, create 4 million new jobs, among other benefits (CARB 2022b).

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 to facilitate the achievement of the state's goals and would not impede attainment of those goals.

Building Energy

The California Building Standards Code was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to support that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every 3 years by the Building Standards Commission and the California Energy Commission (CEC) and revised if necessary (California Public Resources Code Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, to "reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code Section 25402[d]) and cost effectiveness (California Public Resources Code Section 25402[b][2–3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The current Title 24 standards are the 2022 Title 24 building energy efficiency standards that became effective January 1, 2023.

In addition to CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24), which is commonly referred to as California's Green Building Standards (CALGreen), establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality.

Renewable Energy and Energy Procurement

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 electricity utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. The RPS program has been updated multiple times since its adoption, with the most recent revisions in SB 100 and SB 1020, which are described below.

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.

SB 1020 (September 2022) revises the standards from SB 100, requiring the following percentage of retail sales of electricity to California end-use customers to come from eligible renewable energy resources and zero-carbon resources: 90% by December 31, 2035; 95% by December 31, 2040; and 100% by December 31, 2045.

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 CARB to be vehicles that are primarily used for noncommercial personal transportation in the state. EO B-16-12 (March 2012) required that state entities under the governor's direction and control support and facilitate the rapid commercialization of ZEVs. On a statewide basis, EO B-16-12 identified a target reduction of GHG emissions from the transportation sector equaling 80% less than 1990 levels by 2050.

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 was to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR 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 required 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.

An SCS does not: (1) regulate the use of land; (2) supersede the land use authority of cities and counties; or (3) 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.

Advanced Clean Cars Program and Zero-Emissions Vehicle Program

The Advanced Clean Cars (ACC) I 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 of regulations: the Low-Emission Vehicle (LEV) regulation for criteria air pollutant and GHG emissions and a technology forcing regulation for ZEVs that contributes to both types of emission reductions (CARB 2023). The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. 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 than the average new car sold in 2015. The ZEV program will act as the focused technology of the ACC I program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid EVs in the 2018 to 2025 model years.

The ACC II program, which was adopted in August 2022, established the next set of LEV and ZEV requirements for model years after 2025 to contribute to meeting federal ambient air quality ozone standards and California's carbon neutrality standards (CARB 2023). The main objectives of ACC II are as follows:

- Maximize criteria air pollutant and GHG emission reductions through increased stringency and real-world reductions.
- Accelerate the transition to ZEVs through both increased stringency of requirements and associated actions to support wide-scale adoption and use.

The ACC II rulemaking package also considers technological feasibility, environmental impacts, equity, economic impacts, and consumer impacts.

Executive Order N-79-20

EO N-79-20 (September 2020) requires CARB to develop regulations as follows: (1) Passenger vehicle and truck regulations requiring increasing volumes of new ZEVs sold in the state towards the target of 100% of in-state sales by 2035; (2) medium- and heavy-duty vehicle regulations requiring increasing volumes of new zero-emission trucks and buses sold and operated in the state towards the target of 100% of the fleet transitioning to ZEVs by 2045 everywhere feasible and for all drayage trucks to be zero emission by 2035; and (3) strategies, in coordination with other state agencies, the EPA, and local air districts, to achieve 100% zero emissions from off-road vehicles and equipment operations in the state by 2035.

Advanced Clean Trucks Regulation

The Advanced Clean Trucks Regulation was also approved by CARB in 2020. The purpose of the Advanced Clean Trucks Regulation is to accelerate the market for ZEVs in the medium- and heavy-duty truck sector and to reduce air pollutant emissions generated from on-road mobile sources (CARB 2021). The regulation has two components, (1) a manufacturer sales requirement and (2) a reporting requirement:

- **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.
- **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

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.

AB 1668 (2018) and SB 606 (2018) build on Governor Brown's ongoing efforts to make water conservation a way of life in California and create a new foundation for long-term improvements in water conservation and drought planning. SB 606 and AB 1668 establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards. The two bills strengthen the state's water resiliency in the face of future droughts.

Solid Waste

AB 1826 (Chapter 727, Statutes of 2014, effective 2016) requires businesses to recycle their organic waste (i.e., food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste) depending on the amount of waste they generate per week. The minimum threshold of organic waste generation by businesses decreases over time, which means an increasingly greater proportion of the commercial sector will be required to comply.

SB 1383 (2016) requires a 50% reduction in organic waste disposal from 2014 levels by 2020 and a 75% reduction by 2025—essentially requiring the diversion of up to 27 million tons of organic waste—to reduce GHG emissions. SB 1383 also requires that not less than 20% of edible food that is currently disposed be recovered for human consumption by 2025.

Other State Actions

Senate Bill 97

SB 97 (2007) directed the Governor's Office of Planning and Research and CNRA to develop guidelines under CEQA for the mitigation of GHG emissions. 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 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 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 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. 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 2009).

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) Quantify greenhouse gas emissions resulting from a project; and/or (2) Rely on a qualitative analysis or performance based standards" (14 CCR 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 to which 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 15064.4[b]).

4.8.2.3 Local

Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is the MPO for the region, which includes Monterey, San Benito, and Santa Cruz counties. In June 2022, AMBAG adopted the Monterey Bay 2045 Moving Forward – 2045 Metropolitan Transportation Plan/Sustainable Communities Strategy (2045 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 2022). The 2045 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 2022). In addition, AMBAG is working with the Santa Barbara County Association of Governments and the San Luis Obispo Council of Governments to develop the Central Coast Zero Electric Vehicle Strategy that will identify gaps and opportunities to implement zero-emission vehicle infrastructure on the Central Coast, including on or near the State Highway System, major freight corridors, and transit hubs (AMBAG 2022). These transportation strategies would reduce vehicle miles traveled (VMT) and associated petroleum fuels.

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 (Air Basin), where the Proposed Project is located.

City of Santa Cruz Climate Action Plan

In September 2022, the City adopted its CAP that outlines the actions the City will take to achieve the City's 2030 GHG emissions reduction target and the state's SB 32 goal of 40% below 1990 levels by 2030, as well as demonstrates the City's progress towards achieving the target of carbon neutrality in 2035 and beyond (City of Santa Cruz 2022). The CAP includes measures in the following categories: building energy, transportation, water/ waste/wastewater, climate restoration, climate economy, and sustainable municipal government measures. The CAP serves as a Qualified Climate Action Plan for which the City can streamline the environmental review process of some future development projects, based on a Development Compliance Checklist that serves to promote relevant CAP actions and clearly details compliance with the CAP (City of Santa Cruz 2022).

4.8.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of 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.

4.8.3.1 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 and the City of Santa Cruz 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 in Section 4.8.2.4, the Proposed Project is located within the North Central Coast Air Basin under the jurisdiction of the MBARD that, 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 directly apply to the Proposed Project, as the majority of emissions are generated by non-stationary sources of GHG (such as solid waste and on-road vehicles). In the absence of an adopted numeric threshold by the MBARD and the City of Santa Cruz, CEQA allows lead agencies to identify thresholds of significance applicable to a project that are supported by substantial evidence. Substantial evidence is defined in the CEQA statute to mean "facts, reasonable assumptions predicated on facts, and expert opinion supported by facts" (14 CCR 15384[b]).[3] Substantial evidence can be in the form of technical studies, agency staff reports or opinions, expert opinions supported by facts, and prior CEQA assessments and planning documents.

As such, 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 support 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 and AB 1279 were passed that require GHG emissions be reduced to 40% below 1990 levels by 2030, and 85% below 1990 levels by 2045, respectively. Though the CAPCOA threshold does not explicitly consider the reduction targets set by SB 32 or AB 1279, 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 statewide 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

[3] 14 CCR 15384 provides the following discussion: "Substantial evidence" as used in the Guidelines is the same as the standard of review used by courts in reviewing agency decisions. Some cases suggest that a higher standard, the so-called "fair argument standard" applies when a court is reviewing an agency's decision whether or not to prepare an EIR. Public Resources Code section 21082.2 was amended in 1993 (Chapter 1131) to provide that substantial evidence shall include "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." The statute further provides that "argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence."

targets. Projects that generate an incremental increase (above the existing baseline conditions) of emissions beyond the 900 MT CO_2e per year screening level threshold are required to implement feasible 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.

4.8.3.2 Analytical Methods

Potential impacts related to GHG emissions were identified using modeling. Specifically, GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod) Version 2022.1[4] and additional spreadsheet models for construction and operation of the Proposed Project and existing baseline scenarios. Input parameters, including the Proposed Project land use type and size and construction schedule, were based on information provided by the City, or default model assumptions if Proposed Project specifics were unavailable. All assumptions and results are included in Appendix C. 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. Additional information on how impacts were analyzed is provided below.

Construction

Emissions from the construction phase of the Proposed Project were estimated using CalEEMod. 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 4.3, Air Quality. All details for construction criteria air pollutants discussed in Section 4.3.3.2, Analytical Methods, are also applicable for the estimation of construction-related GHG emissions. See Section 4.3.3.2 for a discussion of construction emissions calculation methodology and modeling inputs assumptions used in the GHG emissions analysis.

Operation

Mobile Sources

The Proposed Project would generate GHG emissions from mobile sources (vehicular traffic) as a result of the employee passenger vehicles (workers) and truck traffic associated with the operation of the facility. Emission factors representing the vehicle mix and emissions for year 2029 (for the Proposed Project) and year 2022 (for existing baseline) were used to estimate emissions associated with vehicular sources (i.e., trucks and passenger vehicles). Two land uses in CalEEMod were used to model emissions from mobile sources. The "industrial park" land use was used to model trucks and the "general light industry" land use was used to model passenger cars.[5] The Proposed Project and existing baseline scenarios have the same number of staff; however, the Proposed Project is anticipated to require approximately 514 one-way truck trips (chemical delivery, future granular activated carbon,

[4] CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant emissions associated with the construction and operational activities from a variety of land use projects, such as residential, commercial, and industrial facilities.

[5] Two separate land uses were required to adjust the fleet mix and trip lengths to appropriately represent the trucks and employee vehicles.

and dewatered sludge) per year, whereas the existing baseline only entails approximately 88 one-way chemical delivery trucks per year. With respect to estimated VMT and based on the trip frequency and trip lengths provided by the City, the Proposed Project would generate an estimated 25,700 annual VMT along roadways for trucks and 108,150 annual VMT for employee vehicles. For the existing baseline, the facility generates approximately 4,400 annual VMT along roadways for trucks and 108,150 annual VMT for employee vehicles.

Regulatory measures related to mobile sources include AB 1493 (Pavley) and related federal standards. AB 1493 required that CARB establish GHG emission standards for automobiles, light-duty trucks, and other vehicles that are primarily used for noncommercial personal transportation in the state. In addition, the NHTSA and EPA have established corporate fuel economy standards and GHG emission standards, respectively, for automobiles and light-, medium, and heavy-duty vehicles. Implementation of these standards and fleet turnover (replacement of older vehicles with newer ones) will gradually reduce emissions from the Proposed Project's motor vehicles. The effectiveness of fuel economy improvements was evaluated using the default emission factors for motor vehicles to the extent it was captured in CalEEMod.

Area Sources

CalEEMod was used to estimate GHG emissions from the Proposed Project's area sources that include operation of gasoline-powered landscape maintenance equipment, which produce minimal GHG emissions. See Section 4.3.3.2, for a discussion of landscaping equipment emissions calculations.

Energy Sources

Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. CalEEMod assumes compliance with the 2019 Title 24 code by default, which is conservative as the 2022 Title 24 code is currently applicable. Notably, the Proposed Project would be all-electric and would eliminate natural gas consumption of the existing building.

GHGs associated with electricity generation for the Proposed Project and existing baseline scenarios were estimated using a spreadsheet model and energy intensity factors for Central Coast Community Energy (3CE), which were interpolated from the 3CE 2021 Power Content Label (3CE 2022) (494 pounds of CO_2e per megawatt-hour [lb CO_2e/MWh] at 38% renewables) based on current RPS requirements established by SB 1020 (i.e., 90% renewables by 2035). Thus, the energy intensity factors for the Proposed Project and the existing scenario were estimated to be about 258 lb CO_2e/MWh (year 2029) and 464 lb CO_2e/MWh (year 2022), respectively. Notably, as this interpolation is based on RPS requirements, the values are conservative as 3CE has published a more aggressive goal of 100% renewable energy by 2030 (3CE 2022), 15 years ahead of the statewide RPS mandate established in SB 1020.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the Proposed Project require the use of electricity, which would result in associated indirect GHG emissions. As the facility is a water treatment plant, these indirect GHG emissions were accounted for in the electricity estimate for the Proposed Project and the existing baseline. Similarly, wastewater generated by the facility requires the use of electricity for conveyance and treatment, and GHG emissions will be generated during wastewater treatment. According to the City, the Proposed Project would result in an increase of up to 121,000 gallons per day of water, which was accounted for in CalEEMod. Other indoor and outdoor water demand would be similar to the existing scenario and are therefore not included in the modeling.

Solid Waste

The Proposed Project and existing baseline scenarios would generate solid waste, and therefore, result in CO_2e emissions associated with landfill off-gassing. Municipal solid waste for the Proposed Project would be similar to the existing scenario and are therefore not included in modeling. However, as provided by the City, the Proposed Project would potentially result in about 2,123 cubic yards per year of solids from the upgraded facility processes, which may be sent to a landfill. As these treatment solids would not be similar to municipal solid waste assumed in CalEEMod, GHG emissions from decomposition of these solids from the Proposed Project were estimated using a spreadsheet model. CalEEMod equations for GHGs from solid waste were used in the spreadsheet model, but the degradable organic carbon fraction and degradable anaerobic fraction were adjusted to account for just the "sludge/manure" category, rather than the entire mix of materials in the municipal solid waste stream. Notably, as the sludge/manure category factors are based on wastewater treatment sludge and manure, the GHG emissions estimates for the Proposed Project are likely much larger than what would actually be generated, as the water treatment plant residual solids are anticipated to be primarily inert (i.e., less degradable organic carbon and degradable anaerobic fractions) and result in fewer GHG emissions.

Refrigerants

Refrigerants are substances used in equipment for air conditioning (A/C) and refrigeration. Most of the refrigerants used today are hydrofluorocarbons or blends thereof, which can have high GWP values. All equipment that uses refrigerants has a charge size (i.e., quantity of refrigerant the equipment contains), and an operational refrigerant leak rate, and each refrigerant has a GWP that is specific to that refrigerant. The Proposed Project includes A/C units and heat pumps. Existing equipment at the GHWTP facility include A/C units, refrigerators, an ice machine, and a vending machine. CalEEMod default values were applied based on the assumed land uses, which quantify refrigerant emissions from leaks during regular operation and routine servicing over the equipment lifetime, and then derives average annual emissions from the lifetime estimate (CAPCOA 2022).

Off-Road Equipment

For the Proposed Project and existing baseline scenarios, off-road equipment would operate infrequently, with one propane forklift (modeled as compressed natural gas) assumed to operate for a total of 208 hours per year. In addition, one extendable forklift was assumed to operate 8 hours for one day per month (96 hours per year) under the Proposed Project.

Stationary

The Proposed Project would continue to operate the existing diesel-fueled 2,092-horsepower emergency back-up generator that was assumed to operate one-hour a day for up to 50-hours a year for routine testing and maintenance.

Application of Standard Construction Practices

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented 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.

4.8.3.3 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 would have a significant impact on the environment. ***(Less than Significant)***

Construction Emissions

Construction of the Proposed Project would result in GHG emissions that are primarily associated with use of off-road construction equipment, on-road trucks, and worker vehicles. Construction emissions associated with the Proposed Project are depicted in Table 4.8-4.

Table 4.8-4. Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	R	CO_2e
	Metric Tons Per Year				
2024	24.80	<0.01	<0.01	<0.01	24.91
2025	1,083.87	0.06	0.04	0.29	1,097.93
2026	375.51	0.02	0.01	0.13	379.49
2027	373.82	0.02	0.01	0.12	377.80
2028	305.80	0.01	0.01	0.08	308.75
Total for All Years of Construction	**2,163.80**	**0.10**	**0.07**	**0.62**	**2,188.87**
				Amortized Over 30-Years	*72.96*

Source: Appendix C
Notes: GHG = greenhouse gas; CO2 = carbon dioxide; CH4 = methane; N2O = nitrous oxide; R = Refrigerants; CO2e = carbon dioxide equivalent.
Values of "<0.01" indicate that the estimated emissions are less than 0.01 metric tons per year. Totals may not sum due to rounding.

Since construction emissions are short-term, the total emissions were amortized over 30-years to represent a long-term annual emission rate and summed with the operational emissions for comparison to the applied significance threshold, below.

Operational Emissions

Following the completion of construction activities, the Proposed Project would generate GHG emissions from mobile sources (vehicle trips), area sources (landscaping equipment), energy sources (electricity consumption), centrifuge wastewater treatment, treatment solid waste generation, refrigerants, off-road equipment (forklifts), and stationary sources (emergency generator testing and maintenance). The existing scenario also involves natural gas consumption for building operations but would not result in treatment solid waste generation, as that new source would be due to the Proposed Project. The estimated annual operational Proposed Project and existing baseline scenario GHG emissions from these sources are shown in Table 4.8-5.

Table 4.8-5. Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	CO_2	CH_4	N_2O	R	CO_2e[a]
	Metric Tons Per Year				
Proposed Project[b]					
Mobile	70.27	<0.01	0.01	0.07	72.47
Area	1.27	<0.01	<0.01	–	1.27
Energy - Natural Gas	0.00	0.00	0.00	–	0.00
Energy - Electricity[c]	–	–	–	–	520.61
Wastewater	20.31	1.44	0.03	–	66.47
Treatment Solids	136.20	8.25	0.00	–	342.47
Refrigerants	–	–	–	2.70	2.70
Off-Road Equipment	4.25	<0.01	<0.01	–	4.26
Stationary	54.56	<0.01	<0.01	–	54.75
Total	**286.87**	**9.69**	**0.04**	**2.77**	**1,065.00**
Existing[d]					
Mobile	42.73	0.00	0.00	0.09	43.53
Area	0.84	<0.01	<0.01	–	0.84
Energy - Natural Gas	33.66	<0.01	<0.01	–	33.75
Energy - Electricity[c]	–	–	–	–	312.38
Wastewater	0.00	0.00	0.00	–	0.00
Treatment Solids	0.00	0.00	0.00	–	0.00
Refrigerants	–	–	–	1.79	1.79
Off-Road Equipment	2.30	<0.01	<0.01	–	2.30
Stationary	54.56	<0.01	<0.01	–	54.75
Total	**134.10**	**0.00**	**0.00**	**1.88**	**449.35**
Net Change in Emissions					
Net Change (Project – Existing)	**152.77**	**9.69**	**0.04**	**0.89**	**615.65**
				Amortized Construction Emissions	*72.96*
				Net Change with Amortized Construction Emissions	**688.61**

Source: Appendix C

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; R=refrigerants; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas. Values of "<0.01" indicate that the estimated emissions are less than 0.01 metric tons per year. Totals may not sum due to rounding.

[a] The global warming potential (GWP) concept was developed in order to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2e). CalEEMod assumes that the global warming potential 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.

[b] The emissions inventory for the Proposed Project includes the elimination of natural gas demand, as well as the additional GHGs associated with the facility treatment upgrades (i.e., water/wastewater and treatment solids).

[c] The electrical generation GHG intensity for 3CE for year 2021, which was used to interpolate the intensity for the Proposed Project and existing scenarios, was specifically listed in pounds of CO_2e per megawatt-hour. As such, the GHGs associated with electricity generation are only depicted for CO_2e, rather than separated into CO_2, CH_4, and N_2O.

[d] The emissions inventory for the existing scenario includes the baseline natural gas demand. As described in Section 4.8.3.2, the Proposed Project would not result in new employees and, thus, no wastewater or municipal solid waste GHGs were included in the modeling for the existing scenario, as they would be similar to the Proposed Project.

As shown in Table 4.8-5, the estimated net increase in GHG emissions from operation of the Proposed Project would be approximately 689 MT CO_2e per year, including amortized construction emissions. Annual operational GHG emissions with amortized construction emissions would not exceed the applied significance threshold of 900 MT CO_2e per year. Therefore, the impact of the Proposed Project related to GHG emissions would be less than significant.

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)***

City of Santa Cruz Climate Action Plan

As described in Section 4.8.2.4, the CAP includes measures in the following categories: building energy, transportation, water/waste/wastewater, climate restoration, climate economy, and sustainable municipal government measures. Many of the recommended measures in the CAP would not apply to the Proposed Project. However, the Proposed Project would be supportive of the CAP overall since it would eliminate natural gas consumption at the facility (i.e., all-electric design), the new buildings would be solar ready and designed to maximize solar access for the roofs, and the Proposed Project would include EV charging stations. As such, the Proposed Project would not conflict with the City's CAP.

AMBAGs' Metropolitan Transportation Plan/Sustainable Communities Strategy

AMBAG's 2045 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 2045 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 City and the Proposed Project would not conflict with the 2045 MTP/SCS.

Potential to Conflict with State Reduction Targets and CARB's Scoping Plan

As discussed in Section 4.8.2.3, the California State Legislature passed the Global Warming Solutions Act of 2006 (AB 32) to provide initial direction to limit California's GHG emissions to 1990 levels by 2020 and initiate the state's long-range climate objectives. Since the passage of AB 32, the State has adopted GHG emissions reduction targets for future years beyond the initial 2020 horizon year. For the Proposed Project, the relevant GHG emissions reduction targets include those established by SB 32 and AB 1279 that require GHG emissions be reduced to 40% below 1990 levels by 2030, and 85% below 1990 levels by 2045, respectively. In addition, AB 1279 requires the state achieve net zero GHG emissions by no later than 2045 and achieve and maintain net negative GHG emissions thereafter.

As defined by AB 32, CARB is required to develop The Scoping Plan that provides the framework for actions to achieve the State's GHG emission targets. While the Scoping Plan is not directly applicable to specific projects, nor

is it intended to be used for project-level evaluations,[6] it is the official framework for the measures and regulations that will be implemented to reduce California's GHG emissions in alignment with the adopted targets. Therefore, a project would be found to not conflict with the statutes if it would meet the Scoping Plan policies and would not impede attainment of the goals therein.

The 2017 Scoping Plan included measures to promote renewable energy and energy efficiency (including the mandates of SB 350), increase 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 increase stringency of SB 375 targets. The 2022 Scoping Plan builds upon and accelerates programs currently in place, including moving to zero-emission transportation; phasing out use of fossil gas use for heating homes and buildings; reducing chemical and refrigerants with high GWP; providing communities with sustainable options for walking, biking, and public transit; and displacement of fossil-fuel fired electrical generation through use of renewable energy alternatives (e.g., solar arrays and wind turbines) (CARB 2022b). Many of the measures and programs included in the Scoping Plan would result in the reduction of Proposed Project-related GHG emissions with no action required at the project-level. The Proposed Project would support the 2017 and 2022 Scoping Plan Update's goals by eliminating natural gas (i.e., all-electric facility) and designing the new buildings to maximize solar access for the roofs and to be solar ready, as well as installing EV chargers in the parking lot. The Proposed Project would also benefit from the gradual increase in energy efficiency and reduction in GHG emissions due to the shift from fossil fuels that will be achieved through the statewide programs and measures. Finally, while the Proposed Project does not propose battery storage or hydroelectric generators at the time, the Proposed Project does not preclude installation of these technologies in the future if determined to be a feasible and compatible land use of the site.

The 2045 carbon neutrality goal required CARB to expand proposed actions in the 2022 Scoping Plan to include those that capture and store carbon in addition to those that reduce only anthropogenic sources of GHG emissions. However, the 2022 Scoping Plan emphasizes that reliance on carbon sequestration in the state's natural and working lands will not be sufficient to address residual GHG emissions, and achieving carbon neutrality will require research, development, and deployment of additional methods to capture atmospheric GHG emissions (e.g., mechanical direct air capture). Given that the specific path to neutrality will require development of technologies and programs that are not currently known or available, the Proposed Project's role in supporting the statewide goal would be speculative and cannot be wholly identified at this time.

Overall, the Proposed Project would comply will all regulations adopted in furtherance of the Scoping Plan to the extent applicable and required by law. As mentioned above, several Scoping Plan measures would result in reductions of Proposed Project-related GHG emissions with no action required at the project-level, including those related to energy efficiency, reduced fossil fuel use, and renewable energy production by the utility. As demonstrated above, the Proposed Project would not conflict with CARB's 2017 or 2022 Scoping Plan updates and with the state's ability to achieve the 2030 and 2045 GHG reduction and carbon neutrality goals.

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. Therefore, the impact of the Proposed Project related to conflicts with applicable GHG reduction plans would be less than significant.

[6] The Final Statement of Reasons for the amendments to the CEQA Guidelines reiterates the statement in the Initial Statement of Reasons 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 2009).

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.

4.8.3.4 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 where 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, could 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 4.8-5, the Proposed Project's net increase in GHG emissions would not exceed the applied threshold of 900 MT CO_2e per year. 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 the impact would be less than significant.

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4.9 Hazards and Hazardous Materials

This section describes the existing hazards and hazardous materials conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on a review of online hazardous material site databases, school campus databases, applicable airport proximities and land use plans, local emergency response plans, and fire hazard severity zone maps for the Proposed Project, as part of the preparation of this environmental impact report (EIR). This analysis is also based on the findings of a Lead and Asbestos Report (AECOM/W.M. Lyles Co. 2023a) and a Contaminated Soils and Groundwater Testing and Evaluation Technical Memorandum (AECOM/W.M. Lyles Co. 2023b) prepared for the Proposed Project, and various other asbestos and LBP sampling documents for specific areas within GHWTP. See Section 4.15, Wildfire, for the evaluation of the Proposed Project related to wildfire.

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 hazards and hazardous materials.

4.9.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3 in Chapter 3, Project Description.

4.9.1.1 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:

> [1] waste that exhibits the characteristics may: (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed 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 their 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.

GHWTP Parcel

Site Investigations

Lead and Asbestos

A pre-demolition/renovation lead-based paint (LBP) and asbestos survey was completed for six structures at the GHWTP and reported on in the Lead and Asbestos Report prepared for the Proposed Project (AECOM/W.M. Lyles Co. 2023a). The pre-demolition/renovation survey consisted of a review of building information, visual inspection of the buildings, and sampling and laboratory analysis of bulk samples of building materials to observe, locate, and evaluate the condition of suspected asbestos-containing material (ACM) and LBP before demolition and/or renovation activities. The survey focused on six structures proposed for demolition/renovation as part of the Proposed Project, the existing Operations and Filter Building (building structure only, basement to remain), wash water storage tank, sedimentation basins, and concrete bulk storage tank (see Figure 3-6 in Chapter 3, Project Description). Results of the survey identified friable and non-friable ACM present within the GHWTP. Friable ACM was identified in hot water pipe elbow insulation in the basement, attic, and walls of the Operations and Filter Building, while non-friable ACM was found in concrete boards (transite) in exterior window frames. Additionally, suspect ACM was identified that could not be surveyed due to limited access, including wall coatings in the filter gallery tanks, the walls of the sedimentation basin tank, black barrier materials under the concrete slabs and below the wash water tank, and possible roofing barrier paper under the metal roof on the operations building (AECOM/W.M. Lyles Co. 2023a).

LBP is defined as paint containing 0.5% or greater lead by weight (5,000 parts per million [ppm] or 1 milligram per square centimeter [mg/cm^2]). Lead concentrations up to 9.9 mg/cm^2, measured using a handheld x-ray fluorescence (XRF) spectrum analyzer, were identified in interior and exterior paints throughout the GHWTP facility, specifically the white and blue paints on filter gallery pipes; brown paint on door frames, window frames, and roll-up

door frame; ceramic wall tile paint in the Operations and Filter Building bathrooms; and the white paint on the concrete bulk storage tank valve handles. The paints were in good condition (non-peeling or flaking).

Prior to the 2022 pre-demolition/renovation LBP and asbestos survey conducted for the Proposed Project, other samples were taken in the filter gallery area in 2014 and 2016 and in a water storage tank gasket in 2022. The 2014 Map and Test Results for Lead and Asbestos document summarizes samples collected within the filter gallery to analyze for asbestos and LBP prior to an upgrade project (City of Santa Cruz 2014). Multiple areas were identified that were coated with LBP, and some pipes reportedly contained two or more layers of paint. Lead content, in some cases, exceeded the 1,000 milligrams per kilogram (mg/kg) total threshold limit concentration (TTLC), which classifies this material as hazardous waste. No leachability tests were reported (soluble threshold limit concentration [STLC] or toxicity characteristic leaching procedure [TCLP]) to characterize the hazardous waste toxicity characteristic. Asbestos over 0.1% was identified in the west wall of the GHWTP filter gallery and Operations and Filter Building basement (City of Santa Cruz 2014).

In the 2016 Bulk Sampling Results and Final Report, Limited Asbestos Survey, the interior concrete walls of the filtration area were visually inspected for asbestos, and five bulk samples were collected for laboratory analysis (Aero-Environmental 2016). None of the assessed walls contained greater than 0.1% asbestos. Additionally, no suspect asbestos insulated pipes were observed. However, it was noted some of the insulated pipes were not visible due to their location behind walls, partitions, ceilings, or mechanical equipment.

Two bulk samples were collected in 2022 from the "water storage tank base gasket," which was made of a "tar-like black" material (Vista Environmental Consulting 2022). The sampled area was reported to be approximately 150 linear feet by 6 inches. Analytical results showed 10% asbestos in each of the samples.

Soil and Groundwater Contamination

A soil and groundwater investigation was conducted between August and September 2022 at the GHWTP to pre-characterize the soil and groundwater for the Proposed Project and reported on in the Contaminated Soils and Groundwater Testing and Evaluation Technical Memorandum (AECOM/W.M. Lyles Co. 2023b). Seven total borings were advanced up to 40 feet below ground surface. Groundwater was not encountered in any of the borings; therefore, no water samples were taken during the investigation and groundwater depth is assumed to be greater than 40 feet. A total of 34 soil samples, including 4 duplicates, were collected and analyzed for:

- Title 22 Metals and mercury,
- Total petroleum hydrocarbons as gasoline (TPH-g),
- Volatile organic compounds (VOCs), and
- Waste extraction test (WET) for samples that exceeded 10 times their respective STLC and/or 20 times their respective TCLP limit.

Analytical results were compared to the environmental screening level (ESL) for direct exposure to soils in a construction worker scenario (Construction Worker ESL) to evaluate future requirements for worker protection during construction activities, and the ESL for direct exposure to soils in a commercial/industrial setting (Commercial ESL) (SFRWQCB 2019). Metals were also compared to established regional background concentrations.

Arsenic concentrations detected in 27 soil samples exceeded the Construction Worker ESL of 0.98 mg/kg. Ten of those arsenic concentrations also exceeded the Commercial/Industrial ESL of 0.31 mg/kg. Five samples exceeded background arsenic concentrations of 11 mg/kg (Duverge 2011) and 24 mg/kg (LBNL 2009). All other detected metal concentrations were below their respective ESLs for construction worker or commercial exposure scenarios. The three samples with the highest arsenic concentrations were screened for California and Federal hazardous waste characteristics based on their STLC and TCLP, respectively. All soluble arsenic concentrations were below the STLC criteria of 5.0 milligrams per liter, and no TCLP leachates had detected concentrations of arsenic in the samples taken where construction would occur. In addition, arsenic was not detected above the TTLC. As the soils did not meet hazardous waste characteristics as defined in 22 CCR 66261.24 (based on results of the TTLC, STLC, and TCLP analyses), soils at the project site are considered non-hazardous for waste disposal purposes. For human health risk assessment purposes, arsenic concentrations exceed both typical background concentrations and applicable screening levels for direct human contact with soils during construction activities and commercial use of the project site; protective measures would be required during construction/operational activities in these areas if in-soil work were to be performed. None of the soil samples contained detected concentrations of VOCs or TPH-g above Construction Worker or Commercial/Industrial ESLs.

GHWTP Hazardous Materials Use

As discussed in Section 3.2.3, Existing GHWTP Facilities, the current treatment process consists of pre-chlorination (disinfection), taste and odor control (pretreatment with powder activated carbon contactors and coagulation, flocculation, and clarification with tube settlers), filtration, corrosion control, and post-chlorination (disinfection). In addition, the City's Water Quality Section operates a State-Certified Water Quality Lab at the site. The Water Quality staff perform regulatory sampling at the GHWTP and throughout the distribution system, as well as sampling to characterize source water conditions including targeted sampling during storm events. Hazardous materials currently used and/or stored on site at the GHWTP associated with these operations include the bulleted list below. This list includes hazardous materials documented in the City of Santa Cruz Water Department Product Division's standard operating procedures (SOPs), those reported by Santa Cruz Water Department in their 2022 annual submittal to the California Environmental Reporting System (CERS), and those reported as part of this EIR. The hazardous materials list was last updated February 2023.

- Acetylene
- Aluminum chlorohydrate (ACH)
- Aluminum orthophosphate
- Aluminum sulfate (alum)
- Anionic polymer
- Argon gas
- Carbon slurry (carbon aqueous solution)
- Cationic liquid polymer
- Compressed air
- Diesel fuel
- Distilled vinegar
- Gasoline
- Motor and lubricating oils
- Nitrogen gas
- Non-flammable gas mixture
- Non-ionic polymer
- Oxygen gas
- Potassium permanganate ($KMnO_4$)
- Propane
- Sodium hypochlorite (NaOCl)
- Waste oil

GHWTP submits an annual report to the CERS under the rules and regulations related to the Aboveground Petroleum Storage Act, Chemical Storage Facility Requirements, and Hazardous Waste Generator Rules. These rules regulations are discussed further in Section 4.9.2, Regulatory Framework.

GHWTP Standard Operating Procedures

The City of Santa Cruz Water Department has developed Production SOPs for operation and maintenance of their facilities, including the GHWTP. As they pertain to hazardous materials and hazardous wastes multiple SOPs have been developed and are currently being implemented. The SOPs address safety procedures and best practices for handling, storing, and disposing of hazardous materials and wastes; receiving of bulk chemical deliveries; operations of chemical systems and equipment; system maintenance, including system flushing and repairs; laboratory analysis for water testing; and emergency response procedures (e.g., outages, shutdowns, and earthquakes response).

Utility Corridor

The utility corridor spans between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension. This area contains the existing underground 18- to 24-inch storm drain line, dedicated to the GHWTP, that discharges directly to the San Lorenzo River. The existing stormwater collection system, which was installed in 1960, is made of steel pipe with concrete mortar that may contain asbestos fibers. The City has an easement over the utility corridor; any City maintenance of this corridor does not involve herbicide or pesticide applications. The utility corridor is not likely to be a site that has hazardous materials contamination based on the information presented below in the "Regulatory Records Review for Project Site" section.

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way spans between just north of Mosswood Court and just south of Lyle Way. The two-lane north-south road has generally 11-foot lane widths with less than 2-foot to 3-foot wide shoulders and no on-street parking. This area contains a segment of the County's existing 12-inch gravity sewer in Graham Hill Road and other exiting utilities. The Graham Hill Road right-of-way is not likely to be a site that has hazardous materials contamination based on the information presented below in the "Regulatory Records Review for Project Site" section.

Alternate Sanitary Sewer Lateral Replacement Area

The alternate sanitary sewer lateral replacement area spans from the southwest corner of the GHWTP parcel at Ocean Street Extension and along Ocean Street Extension to the City Public Works Department maintained sanitary sewer connection at Graham Hill Road. Ocean Street Extension is a paved but largely unimproved road. This area contains an underground segment of the City's existing 4-inch sewer lateral located in Ocean Street Extension. The alternate sanitary sewer lateral replacement area is not likely to be a site that has hazardous materials contamination based on the information presented below in the "Regulatory Records Review for Project Site" section.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area for the Proposed Project is located on Ocean Street Extension. This area currently being used for temporary staging and laydown of equipment and/or storage. The Ocean Street Extension staging area is not likely to be a site that has hazardous materials contamination based on the information presented below in the "Regulatory Records Review for Project Site" section.

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is located at the northern intersection of Graham Hill Road and Mt. Hermon Road. This area has been previously used for temporary staging and laydown of equipment and/or storage. The Mt. Hermon Road staging area is not likely to be a site that has hazardous materials contamination based on the information presented below in the "Regulatory Records Review for Project Site" section.

Regulatory Records Review for Project Site

Cortese List Sites

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 California Department of Toxic Substances Control (DTSC) EnviroStor database (Health and Safety Codes 25220, 25242, 25356, and 116395).
- List of leaking underground storage tank (LUST) sites from the State Water Resources Control Board (SWRCB) GeoTracker database (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 active cease and desist orders and cleanup and abatement orders identified by the SWRCB GeoTracker database (Water Code Sections 13301 and 13304).
- 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.

A search of the Cortese List databases was conducted on February 15, 16, and 17, 2023 to identify sites within 1 mile of the primary project site and associated staging areas, except LUST sites, which were searched within 0.50 miles of the primary project site and staging areas (based on standard due diligence search radii as defined in ASTM E1527-21) (Cortese 2023). The primary project site and staging areas are not located on a Cortese List site. Cortese List sites were not identified within 1 mile of the primary project site; multiple Cortese List sites were identified within 1 mile of the staging areas. Table 4.9-1 provides a brief summary of the sites identified.

Table 4.9-1. Cortese List Sites Summary

Database	Details
GeoTracker (LUST sites per Health and Safety Code 25295)	Nine LUST sites were identified within 0.50 miles of the Ocean Street Extension staging area, and seven LUST sites were identified within 0.50 miles of the Mt. Hermon Road staging area. All sites, except two, are located on the west side of the San Lorenzo River, on the opposite side of the river from the staging areas. As with most flowing surface water bodies, the location of the river provides a hydraulic barrier for groundwater flow. This hydraulic barrier also typically provides a barrier for contaminant migration. As such, contaminated sites on the west side of the river are not likely to impact the staging areas on the east side of the river. Additionally, all of the LUST cases, including those on the east side of the San Lorenzo River, have received regulatory closure, indicating that contamination either was determined not to be a risk to human health and the environment, or contamination was remediated to the satisfaction of the regulatory agency. In addition to regulatory closure, none of the sites are adjoining the staging areas, utility corridor, or alternate sanitary sewer lateral replacement area (see Figure 3-3). As such, these LUST cases do not appear likely to impact the environmental condition of the project site.
EnviroStor (state and federal cleanup sites per Health and Safety Codes 25220, 25242, 25356, and 116395)	Two state cleanup sites were identified within 1 mile of the Ocean Street Extension staging area. Both sites have received certification (closure) from DTSC, indicating remediation is complete. The sites are also hydraulically downgradient from the staging area (south and on the east side of the San Lorenzo River).
Solid Waste Disposal Sites (Water Code Section 13273 subdivision [e] and 14 CCR Section 18051)	No sites were identified within 1 mile of the primary project site or staging areas.
Active cease and desist orders (Water Code Sections 13301 and 13304)	No sites were identified within 1 mile of the primary project site or staging areas.
Hazardous waste facilities (Health and Safety Code Section 25187.5)	No sites were identified within 1 mile of the primary project site or staging areas.

Non-Cortese List Sites

Dudek also reviewed online databases that provide environmental information on releases and cleanup cases in the State of California. While these databases are not included in the Cortese List, they may provide additional information regarding potential environmental contamination at or near the primary project site or staging areas. Table 4.9-2 provides a summary of the databases searched.

Table 4.9-2. Online Database Listings

Database	Details
California Environmental Protection Agency (CalEPA) https://siteportal.calepa.ca.gov/nsite/	The CalEPA Regulated Site Portal is a website that combines data about environmentally regulated sites and facilities in California into a single, searchable database and interactive map. Data sources include California Environmental Reporting System (CERS), EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), and Toxics Release Inventory (TRI).
Department of Toxic Substances Control (DTSC) EnviroStor https://www.envirostor.dtsc.ca.gov/	The DTSC's data management system for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons for further investigation.
Regional Water Quality Control Board (RWQCB) GeoTracker http://geotracker.waterboards.ca.gov/	The California RWQCB's data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. GeoTracker contains records for sites that require cleanup, various unregulated projects, and permitted facilities. Sites include LUSTs, Department of Defense, Cleanup Program, Irrigated Lands, Oil and Gas Production, Permitted USTs, and Land Disposal Sites.
National Pipeline Mapping System https://www.npms.phmsa.dot.gov/	The National Pipeline Mapping System Public Map Viewer is a web-based application designed to assist the general public with displaying and querying data related to gas transmission and hazardous liquid pipelines, liquefied natural gas plants, and breakout tanks under Department of Transportation Pipeline and Hazardous Material Safety Administration jurisdiction.
California Geologic Energy Management (CalGEM) Well Finder https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx	The CalGEM Well Finder is a web-based application that plots reported locations and other information for oil and gas wells and other types of related facilities across California.
CalRecycle Solid Waste Information System (SWIS) https://www2.calrecycle.ca.gov/SolidWaste/Site/Search	The SWIS database contains information on solid waste facilities, operations, and disposal sites throughout the State. Solid waste activities include landfills, transfer stations, composting sites, in-vessel digestion sites, engineered municipal solid waste conversion facilities, transformation facilities, and closed disposal sites.

Multiple non-Cortese List hazardous material sites were identified within 0.50 miles of the primary project site and/or staging areas. A summary of the findings is presented in Table 4.9-3

Table 4.9-3. Hazardous Material Site Summary

Database	Details
CalEPA Regulated Site Portal	The GHWTP is identified on the CalEPA Regulated Site Portal. This listing is administrative in nature, and identifies reported hazardous materials and hazardous wastes reported at the GHWTP under the Aboveground Petroleum Storage Act, Chemical Storage Facility Requirements, and Hazardous Waste Generator Rules. Reported chemicals are summarized under "GHWTP Hazardous Materials" subsection above.
GeoTracker	In addition to the LUST sites discussed in Table 4.9-1, five cleanup case sites were identified; two within 0.50 miles of the Mt. Hermon Road staging area and three within 0.50 miles of the Ocean Street Extension staging area. As with the LUST cases, these sites are hydraulically separated from the staging areas by the San Lorenzo River. Review of groundwater monitoring reports for two sites, one near each staging area, confirmed groundwater impacts at these cleanup sites are not likely to migrate across the river and impact the staging areas (Trinity 2018; WHA 2020).
EnviroStor	In addition to the sites listed in Table 4.9-1, two cleanup sites were identified within 0.50 miles of the staging areas, one near the Mt. Hermon Road staging area and one near the Ocean Street Extension staging area. One site is hydraulically separated by the San Lorenzo River, the other is a cleanup site identified in the GeoTracker database (discussed above). Based on available information, it is not likely these sites have impacted the environmental condition of the staging areas.
NPMS and CalGEM	A Pacific Gas & Electric Co. (PG&E) natural gas pipeline is present along Graham Hill Road, approximately 0.47 miles southeast of the Mt. Hermon staging area and intersecting the eastern edge of the GHWTP parcel, all of the Graham Hill Road right-of-way, and the extent of the alternate sanitary sewer lateral replacement area (see Figure 4.9-1). No active oil and gas wells were identified within 0.50 mile of the primary project site or staging areas.
SWIS	No sites were identified within 0.50 mile of the primary project site or staging areas.

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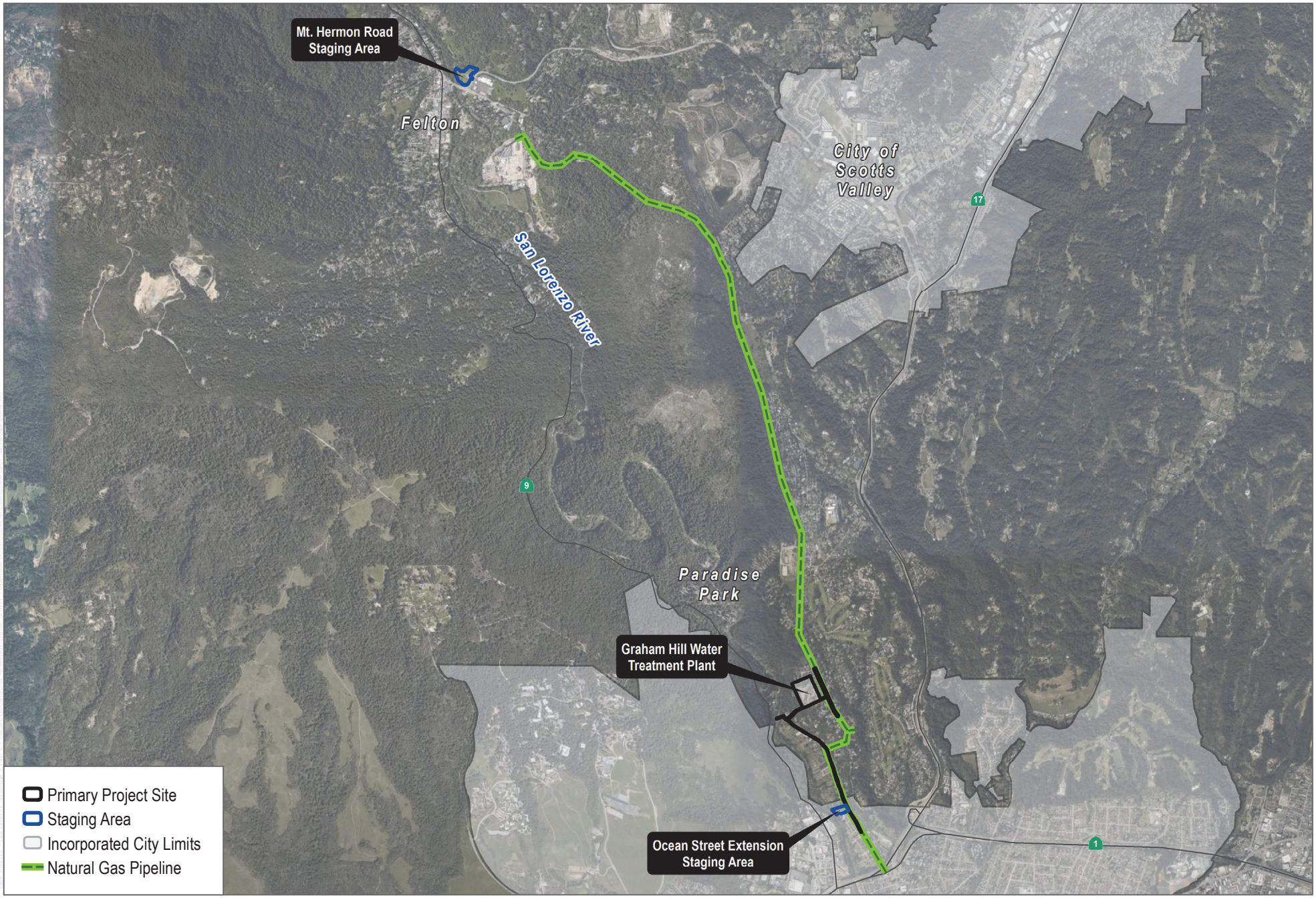

SOURCE: Bing Maps 2022, CAL FIRE 2007, Santa Cruz County 2020

DUDEK

0 2,000 4,000 Feet

FIGURE 4.9-1

Natural Gas Pipeline

Graham Hill Water Treatment Plant Facility Improvements Project

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4.9.1.2 Other Hazards

Airport Hazards

The Federal Aviation Administration (FAA) has filing requirements for proposed structures that vary based on factors such as height, location, and proximity to an airport (see Section 4.9.2.1, Federal Regulatory Framework). No airports are located within 2 miles of the primary project site or staging areas, nor do they lie within an airport land use plan (AirNav 2023). Based on the analysis of the Proposed Project using the FAA Obstruction Evaluation/Airport Airspace Analysis (OEAAA) Notice Criteria Tool (FAA 2023), using an assumed maximum building height of 45 feet, there are no areas that exceeded notice criteria where notification would be required in accordance with Title 14 of the Code of Federal Regulations (CFR), Section 77.9.

Emergency Response

The GHWTP parcel and Ocean Street Extension staging area fall within the City of Santa Cruz, while the proposed utility corridor, Graham Hill Road right-of-way, alternate sanitary sewer lateral replacement area, and Mt. Hermon Road staging area are located outside the City limits and fall within unincorporated County of Santa Cruz. Within both the City and County of Santa Cruz, Santa Cruz County Environmental Health is the Certified Unified Program Agency (CUPA) for the Proposed Project, and as such provides regulatory oversight for management and storage of hazardous materials and hazardous wastes. Santa Cruz County Hazardous Material Interagency Team (SCHMIT) conducts local hazardous material response. Santa Cruz County Environmental Health provides hazardous materials technical specialists available for support during incident response.

The City of Santa Cruz Emergency Operations Plan (City of Santa Cruz 2018) outlines the standard operating procedures on how to handle public emergencies inclusive of natural disasters, hazardous material incidents, and other man-made disasters. In general, the City's Emergency Operations Plan refers to County programs for hazardous material management. Santa Cruz County has a Hazardous Materials Area Plan, an annex to the County Operational Area Plan, which outlines how the County will manage a hazardous materials spill or release (County of Santa Cruz 2017). The Santa Cruz County Office of Response, Recovery & Resilience 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 Cruz Aware (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 (OR3 2023).

4.9.1.3 Proximity to Schools

No public schools are located within 0.25 miles of the primary project site or staging areas (CDE 2023; GreenInfo 2021). The nearest school is a cluster of schools, located approximately 0.40 miles northwest of the Mt. Hermon staging area. The cluster of schools includes Ludlow Preschool, located at 7101 Highway 9, San Lorenzo Valley Elementary School, located at 7155 Highway 9, San Lorenzo Valley High School, located at 7105 Highway 9, and San Lorenzo Valley Middle School, located at 7179 Hacienda Way, all in Felton, California.

4.9.2 Regulatory Framework

4.9.2.1 Federal

Toxic Substances Control Act (1976)

The Toxic Substances Control Act of 1976 provides the U.S. Environmental Protection Agency (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.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress in 1980. CERCLA provides a federal "Superfund" to clean up uncontrolled or abandoned hazardous waste sites, as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through CERCLA, EPA was given power to seek out those parties responsible for any release and support their cooperation in the cleanup.

Emergency Planning and Community Right-To-Know Act

Authorized by Title III of the Superfund Amendments and Reauthorization Act, the Emergency Planning and Community Right-to-Know Act was enacted by Congress in 1986 as the national legislation on community safety. This law is designed to help local communities protect public health, safety, and the environment from chemical hazards. To implement the Emergency Planning and Community Right-to-Know Act, Congress requires each state to appoint a State Emergency Response Commission. The State Emergency Response Commissions are required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee for each district. The project site is located in Administrative, Mutual Aid, and Local Emergency Planning Committee Region II, Coastal (OES 2023). Broad representation by firefighters, health officials, government and media representatives, community groups, industrial facilities, and emergency managers supports that all necessary elements of the planning process are represented.

Chemical Accident Prevention Provisions (Risk Management Plan)

Code of Federal Regulations Title 40 Part 68, Chemical Accident Prevention Provisions, outlines the rules and requirements for regulated substances and thresholds of those substances. Owners and operators of stationary source facilities that store and handle over the threshold quantity of regulated substances,[1] as identified in Table 1 of 40 CFR Section 68.130, List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention, are required to implement accidental release prevention measures. This includes preparation of a Risk Management Plan (RMP) as described in 40 CFR Sections 68.150 through 68.185. The RMP would include management systems, hazards assessments, prevention programs, and emergency response procedures associated with the applicable regulated substances.

[1] Stationary source is defined in 40 CFR 68.3, Definitions, and means any buildings, structures, equipment, installations, or substance emitting stationary activities which belong to the same industrial group, which are located on one or more contiguous properties, which are under the control of the same person (or persons under common control), and from which an accidental release may occur. See Chapter 4.3, Air Quality, for more information regarding stationary emission sources.

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 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 supporting 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.

Title 29 USC, Part 1926 et seq. requires employee training; personal protective equipment; safety equipment; and written procedures, programs, and plans for supporting worker safety when working with hazardous materials or in hazardous work environments during construction activities, including renovations and demolition projects and the handling, storage, and use of explosives. These standards also provide rules for the removal and disposal of asbestos, lead, LBP, and other lead materials. Although intended primarily to protect worker health and safety, these requirements also guide general facility safety. This regulation also requires that an engineering survey is prepared prior to demolition.

Title 29 USC, Part 1910 et seq. requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; inventory safety equipment relevant to potential hazards; have knowledge on safety equipment use; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan and prepare a fire prevention plan.

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 UST program.

Universal Wastes

Title 40 USC, Chapter 1, Subchapter I, Part 273 governs the collection and management of widely generated waste, including batteries, pesticides, mercury-containing equipment, and bulbs. This regulation streamlines the hazardous waste management standards and allows that such waste is diverted to the appropriate treatment or recycling facility.

U.S. Department of Transportation

The Department of Transportation established standards for the transport of hazardous materials and hazardous wastes (49 USC, Part 172, Subchapter C – Shipping Papers). The standards include requirements for labeling, packaging, and shipping hazardous materials and hazardous wastes, as well as training requirements for personnel responsible for shipping papers and manifests.

Regional Screening Levels

The federal EPA provides regional screening levels (RSLs) for chemical contaminants to provide comparison values for residential and commercial/industrial exposures to soil, air, and tap water (drinking water). 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.

Federal Response Plan

The Federal Response Plan of 1999, as amended in 2003 (FEMA 2003) 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.

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 support 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 support that these safety measures are met, IFC employs a permit system based on hazard classification. The IFC is updated every 3 years.

Oil Pollution Prevention

Oil Pollution Prevention regulations, Title 40 USC, Chapter 1, Subchapter D, Part 112, require the preparation of a spill prevention, control, and countermeasure (SPCC) plan if oil is stored in excess of 1,320 gallons in aboveground storage (or have a buried capacity of 42,000 gallons). SPCC regulations place restrictions on the management of petroleum materials and, therefore, have some bearing on hazardous materials management.

National Emission Standard for Asbestos

Title 40 USC, Chapter 1, Subchapter C, Part 61 – National Emission Standards for Hazardous Air Pollutants, Subpart M, established National Emission Standards for Hazardous Air Pollutants (NESHAP) and names ACM as one of these materials. ACM use, removal, and disposal are regulated by EPA under this law. In addition, notification of friable ACM removal prior to a proposed demolition project is required by this law.

Federal Aviation Administration

Title 14 USC, Chapter 1, Subchapter E, Part 77, establishes requirements for notifying the FAA of certain construction activities and alterations to existing structures, in order to ensure there are no obstructions to navigable airspace. For example, projects that include construction or alteration exceeding 200 feet in height above ground level are required to notify the FAA.

4.9.2.2 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 (CalARP) 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 CUPAs to implement hazardous waste and materials standards. Santa Cruz County Environmental Health Services is designated as the local CUPA in Santa Cruz County and would facilitate hazardous material and hazardous waste permitting for the Proposed Project.

Title 19 CCR, Chapter 2, Subchapter 3, Sections 2729-2734/California Health and Safety Code Division 20, Chapter 6.95, Sections 25500–25520 requires the preparation of a hazardous materials business plan (HMBP) by facility operators. The HMBP identifies the hazards, storage locations, and storage quantities for each hazardous chemical stored on site. The HMBP is submitted to the CUPA for emergency planning purposes. The project site is currently subject to these requirements and there is an HMBP in place.

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.

Title 22 CCR, Division 4.5, designates the DTSC to regulate hazardous wastes. These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting waste off site; and use only permitted treatment, storage, and disposal facilities. Standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters.

In addition, Chapter 31 of these regulations – Waste Minimization, Article 1 – Pollution Prevention and the Hazardous Waste Source Reduction and Management Review requires that generators of 12,000 kilograms/year of typical, operational hazardous waste evaluate their waste streams every four years and, as applicable, select and implement viable source reduction alternatives. This Act does not apply to non-typical hazardous waste, including ACM and PCBs, among others.

HHRA Note Number 3 presents recommended screening levels (derived from the EPA RSLs using DTSC-modified exposure and toxicity factors) for constituents in soil, tap water, and ambient air. The DTSC-modified screening level (DTSC-SL) should be used in conjunction with the EPA RSLs to evaluate chemical concentrations in environmental media at California sites and facilities.

California Accidental Release Prevention Program

Similar to the Federal Risk Management Program, the CalARP 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 CalARP 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.

The RMP as described by CalARP is required for any owner or operator of a stationary source that has more than a threshold quantity of regulated substances specified in Tables 1–3, CCR, Title 19 Section 2770.5.

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

an HMBP that contains 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 ppm 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 an RMP and CalARP Plan.

Aboveground Storage Tanks

Title 22 California Health and Safety Code, Division 20, Chapter 6.67, Sections 25270 to 25270.13_applies if a facility is subject to SPCC regulations under Title 40 USC Part 112, or if the facility has 10,000 gallons or more of petroleum in any or combination of aboveground storage tanks and connecting pipes. If a facility exceeds these criteria, it must prepare an SPCC 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

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.

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 support 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.

Regional Screening Levels

In California, the DTSC Human and Ecological Risk Office (HERO) incorporated the EPA RSLs (see 4.9.2.1, Federal Regulations) into the HERO human health risk assessment. HERO created Human Health Risk Assessment (HHRA) Note 3 incorporates HERO recommendations and 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.

Environmental Screening Levels

ESLs provide conservative screening levels for over 100 chemicals found at sites with contaminated soil and groundwater. They are intended to help expedite the identification and evaluation of potential environmental concerns at contaminated sites. The ESLs were developed by San Francisco Bay Regional Water Quality Control Board; however, they 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 of California, provided all stakeholders agree (SFBRWQCB 2019). In recent experience, regulatory agencies in various regions use 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.

Lead-Based Paint

The California Department of Public Health enforces lead laws and regulations related to the prevention of lead poisoning in children, prevention of lead poisoning in occupational workers, accreditation and training for construction-related activities, lead exposure screening and reporting, disclosures, and limitations on the amount of lead found in products. Accredited lead specialists are required to find and abate lead hazards in a construction project and to perform lead-related construction work in an effective and safe manner. The specific regulations that are relevant to the Proposed Project are as follows:

- California Health & Safety Code Section 105250 establishes a program to accredit lead-related construction training providers and certify individuals to conduct lead-related construction activities.
- California Civil Code Section 1941.1; California Health & Safety Code Sections 17961, 17980, 124130, 17920.10, 105251 to 105257 deems a building to be in violation of the State Housing Law if it contains lead hazards, and requires local enforcement agencies to enforce provisions related to lead hazards. Makes it a crime for a person to engage in specified acts related to lead hazard evaluation, abatement, and lead-related constructions courses, unless certified or accredited by the Department. Permits local enforcement agencies to order the abatement of lead hazards or issue a cease and desist order in response to lead hazards.
- California Civil Code Sections 1102 to 1102.16 requires the disclosure of known LBP hazards upon sale of a property.
- California Labor Code Sections 6716 to 6717 provides for the establishment of standards that protect the health and safety of employees who engage in lead-related construction work, including construction, demolition, renovation, and repair.
- California Health & Safety Code Sections 116875 to 116880 requires the use of lead-free pipes and fixtures in any installation or repair of a public water system or in a facility where water is provided for human consumption.

- California Health & Safety Code Sections 105185 to 105197 establishes an occupational lead poisoning prevention program to register and monitor laboratory reports of adult lead toxicity cases, monitor reported cases of occupational lead poisoning to ascertain lead poisoning sources, conduct investigations of take-home exposure cases, train employees and health professionals regarding occupational lead poisoning prevention, and recommended means for lead poisoning prevention.

Asbestos and Air Quality

The Monterey Bay Air Resources District (MBARD) is responsible for overseeing compliance with the federal Asbestos NESHAPs in Santa Cruz County. The Asbestos NESHAP Program enforces compliance with the federal NESHAP regulation for asbestos and investigates all related complaints, as specified by California Health and Safety Code Section 39658(b)(1). Under Rule 424, MBARD requires surveys for asbestos prior to demolition or renovation activities which could disturb asbestos materials. The survey must be included with the notification to MBARD for demolition/renovation of regulated projects as defined under Rule 424 and 40 CFR Part 61, Subpart M (National Emission Standard for Asbestos).

The California Department of Consumer Affairs Contractors State License Board manages the licensing of asbestos abatement contractors.

California Dig Law

Title 1, Division 5, Chapter 3.1, Article 2, Section 4216 requires, prior to any excavation,[2] the excavator to delineate the area to be excavated, so that subsurface utilities can be identified and marked. The excavator will contact the regional notification center at least 2 days but not more than 14 days prior to excavation. The regional notification center will in turn identify and notify all appropriate owners and agencies with subsurface utilities in the area. Excavation will not begin until subsurface utilities are marked.

4.9.2.3 Local

Monterey Bay Air Resources District

MBARD requires under Regulation 4, Rule 439, that "there shall be no visible emissions whatsoever from building removals" and that work practice standards are to be followed during building removals to prevent visible emissions, to support that the structure is demolished inward toward the building pad, and to cease removal activities during wind speeds in excess of 15 miles per hour (MBARD 2006).

The MBARD outlines fee requirements under Regulation 3, Rule 306, for "persons subject to Rule 424, Section 4 Subpart M, National Emission Standards for Asbestos (40 CFR 61 Subpart M)" that are required to submit a written Notification of Demolition and Renovation to the District, including "any owner or operator of any demolition activity, regardless of whether any asbestos is present in the facility to be demolished; and any owner or operator of a renovation activity where the total amount of Regulated Asbestos-Containing Material (RACM) to be stripped,

[2] According to Title 1, Division 5, Chapter 3.1, Article 2, Section 4216(g), excavation is defined as "any operation in which earth, rock, or other material in the ground is moved, removed, or otherwise displaced by means of tools, equipment, or explosives in any of the following ways: grading, trenching, digging, ditching, drilling, augering, tunneling, scraping, cable or pipe plowing and driving, or any other way."

removed or otherwise disturbed is at least 260 linear feet on pipes, 160 square feet on other facility components or 35 cubic feet off of facility components" (MBARD 2022).

County of Santa Cruz Environmental Health

As previously discussed, Santa Cruz County Environmental Health Services 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 HMBPs and hazardous material management plans. The various fire departments work in conjunction with County Environmental Health in responding to reports of hazardous materials spills and accidents, enforcing hazardous materials regulations, and enforcing the fire codes as it relates to the use and storage of hazardous materials.

Septic tank destruction is required to be permitted through County Environmental Health. A Septic Tank Destruction Application is submitted, typically by a Qualified Professional, who then follows the Septic Tank Destruction Procedures published by County Environmental Health.

County of Santa Cruz General Plan and Local Coastal Plan – Chapter 6: Public Safety

California Government Code Section 65302(g) requires the development of Safety Elements. The County of Santa Cruz General Plan and Local Coastal Plan Safety Element (County of Santa Cruz 2020) provides policies that meet the General Plan objectives. This chapter of the General Plan was not updated as part of the recent update to the County's General Plan, known as the Sustainability Policy and Regulatory Update. The following policies relate specifically to hazards and hazardous materials and may apply to the Proposed Project:

- Policy 6.5.1 requires access standards for new construction to allow emergency vehicle access.
- Policy 6.5.3 sets conditions for project approval, including adequate water availability, flammable vegetation clearance, smoke detection devices, fire retardant roofs, and adequate disposal of refuse.
- Policy 6.5.4 sets fire protection standards for building sites outside urban services line, including access requirements, building requirements for those located inside critical fire hazard areas, flammable vegetation control, and water availability.
- Policy 6.5.8 discourages locating public facilities in Critical Fire Hazard Zones, and when unavoidable, special precautions shall be taken to support the safety and uninterrupted operation of these facilities.
- Policies 6.6.1 through 6.6.3 provide standards for use, maintenance, and control of hazardous material use and storage. Hazardous material users are obligated to minimize or eliminate hazardous material use wherever possible. The County will maintain standards which are at least equal in protection for the environment and community as those imposed by other local governments within Santa Cruz County, and in adjoining counties.
- Policies 6.7.1 through 6.7.13 provides requirements for all facilities that collect, handle, transport, treat, store, or dispose of hazardous waste. These policies include sizing and location of said facilities, taking into account floodplains, sensitive habitats, agricultural land, mineral resources, nearby residences and immobile populations, and depths to groundwater (maximum depth of 20 feet below ground surface). Facility location will also take into account safe emergency response and transportation routes and proximity to public services and utilities.

City of Santa Cruz General Plan

The City of Santa Cruz General Plan, Hazards, Safety, and Noise Chapter (City of Santa Cruz 2019a) includes objectives and policies on emergency access and hazardous materials. Goal HZ1 provides policies and actions that pertain to the City's emergency and disaster readiness. Policies HZ1.1 through HZ1.5 provides measures that facilitates the City's emergency preparedness, supports rapid emergency response, provides public education on what to do in an emergency, continues to meet the fire safety and firefighting needs, and reduces potential fire hazards. Goal HZ4 provides policies and actions that pertain to reducing danger and impacts from hazardous materials. Policies HZ4.1 through HZ4.5 provides measures that regulate hazardous wastes with respect to potential leakage, explosions, fires, escape of harmful gases, or formation of new hazardous substances, supports proper handling and disposal of hazardous waste, allows that resources are available for quick and proper response to hazardous waste emergencies, reduces the risk of exposure to hazardous materials from sites being developed or redeveloped, and maintains City as a nuclear free zone.

4.9.3 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.

4.9.3.1 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, would it create a significant hazard to the public or the environment.

E. Result in a safety hazard or excessive noise for people residing or working in the project area, 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.

F. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

G. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. (See Section 4.15, Wildfire, for the evaluation of this significance threshold.)

4.9.3.2 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 4.9.2 Regulatory Framework. A review of GHWTP site investigations and applicable regulatory records was conducted to characterize the existing environmental setting in the study area, as described above in Section 4.9.1, 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. 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, regulations, and standard construction practices (see below), impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. Standard construction practice #5 (spill prevention) applies to the Proposed Project. Where applicable, this practice and its effectiveness in avoiding or minimizing impacts related to hazardous material are described in Section 4.9.3.3, Project Impact Analysis.

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:

- **Hazardous Materials Near Schools (Significance Threshold C).** There are no schools located within 0.25 miles of the primary project site or staging areas, and the Proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials within 0.25 miles of an existing or proposed school. Therefore, the Proposed Project would have no impact.
- **Cortese List Hazards (Significance Threshold D).** The Proposed Project would not create a significant hazard to the public or the environment related to hazardous materials sites because it is not located on a hazardous materials site that is included on a list compiled pursuant to Government Code Section 65962.5, as described in Section 4.9.1, Existing conditions, above. Therefore, the Proposed Project would have no impact.
- **Airport Hazards (Significance Threshold E).** The Proposed Project would not result in a safety hazard or excessive noise for people working or residing in the project area due to airports because the project site is not located within 2 miles of a public use airport nor is it located within an airport land use plan. Therefore, the Proposed Project would have no impact.

Project Impacts

Impact HAZ-1	Routine Transport, Use, or Disposal of Hazardous Materials (Significance Threshold A). Construction and operation of the Proposed Project would require routine use and transportation of hazardous materials but would not result in a significant hazard to the public or environment. Demolition, construction, and excavation activities have the potential to create a significant hazard to the public or environment due to the improper handling, transportation, and disposal of hazardous building materials and impacted soils. ***(Potentially Significant)***

Based on Section 4.9.1, Existing Conditions, the only environmental conditions at the primary project site and staging areas of potential concern are at the GHWTP parcel and along the utility corridor, as described herein. The Graham Hill Road right-of-way, the alternate sanitary sewer lateral replacement area, the Mt. Hermon Road staging area, and the Ocean Street Extension staging area are not expected to have environmental conditions with potential to create a significant hazard to the public or environment due to the improper handling, transportation, and disposal of hazardous building materials and impacted soils. These locations are not likely to have hazardous materials contamination based on the information presented in Section 4.9.1 in the "Regulatory Records Review for Project Site" section.

Lead and Asbestos

Building materials at the GHWTP contain ACM and LBP, as outlined in the various lead and asbestos reports described in Section 4.9.1, Existing Conditions. Specifically, friable and non-friable ACM is present within the six structures at the GHWTP that are scheduled for demolition/renovation as part of the Proposed Project (i.e., the existing Operations and Filter Building, wash water storage tank, portions of the existing sedimentation basins, and concrete bulk storage tank) and lead was identified in interior and exterior paints throughout the GHWTP facility (AECOM/W.M. Lyles Co, February 24, 2023a). Federal, state, and local rules and regulations would be followed and the recommendations of the Lead and Asbestos Report would be implemented, to properly abate, dispose of, or protect ACM and LBP during project construction and operation. These rules and regulations include:

- **For Asbestos:** Title 40 USC, Chapter 1, Subchapter C, Part 61 – National Emission Standards for Hazardous Air Pollutants, California Health and Safety Code Section 39658(b)(1) – Enforcement of NESHAP by the State of California, California Contractors State License Board – Licensing of Abatement Contractors, MBARD Regulation 3, Rule 306 – Fees for Asbestos Removal.
- **For Lead Based Paint:** California Health & Safety Code Section 05250 – Lead-Related Construction Activities, California Civil Code Section 1941.1 and California Health & Safety Code Sections 17961, 17980, 124130, 17920.10, and 105251 to 105257 – Requirements for lead abatement contractor accreditation, California Labor Code Sections 6716 to 6717 – Requirements for health and safety of employees in lead-related construction work, and California Health & Safety Code Sections 105185 to 105197 – Occupational lead poisoning prevention program.

Additionally, the following recommendations in the Lead and Asbestos Report (AECOM/W.M. Lyles Co, February 24, 2023a) would also be implemented with the Proposed Project:

- Remove and dispose of ACM prior to renovation using a licensed abatement contractor in accordance with federal, state, and local regulations and ordnances.
  - Bid packages should include specifications for renovation to control ACM and ensure appropriate removal techniques.
  - Third party oversight should be contracted to document appropriate abatement techniques and equipment are used, and proper disposal is achieved.
- Maintenance and renovation activities involving less than 100 square feet of ACM would include the following precautions:
  - No cutting, sanding, or drilling of ACM or suspect ACM.
  - Wetting ACM or suspect ACM prior to activities which could disturb the material.
  - Dust removal with HEPA filtration vacuums or wet wiping with disposable towels.
  - Adherence to federal, state, and local regulations for property ACM disposal.
- Flaking or peeling LBP should be removed by a licensed lead abatement contractor following applicable federal, state, and local regulations.
  - The renovation contractor should implement health and safety according to OSHA 29 CFR 1926.62, Lead in Construction.
  - Dispose of all painted material as construction debris in accordance with federal, state, and local regulations; debris containing LBP should not be recycled.

There is a potential for existing concrete subsurface piping within the storm drain line that is located in the utility corridor to contain asbestos. As discussed in Chapter 3, Project Description, Section 3.4.2.4, Infrastructure and Site Improvements, the existing stormwater collection system, which was installed in 1960, is made of steel pipe with concrete mortar. As also noted, a condition assessment of these pipes has not been performed due to inaccessibility. Based on the construction type and age, it is possible these pipes contain asbestos fibers in the concrete mortar and removal or replacement of these pipes and mortar has the potential to create a hazard due to disturbance and improper disposal of asbestos. When improperly handled, asbestos particles could be released during routine demolition, transport, and disposal, exposing the public to hazardous materials, a potentially significant impact.

Implementation of Mitigation Measure (MM) HAZ-1 (Evaluation of Stormwater Piping) would avoid a significant hazard to the public or environment from improper handling, transportation, and disposal of asbestos by having a California-licensed asbestos contractor evaluate the piping for the presence of asbestos prior to any renovation, removal, or modification of these pipes. Any concrete mortar that contains asbestos above applicable regulatory levels will either be properly abated in accordance with rules and regulations applicable for asbestos removal and disposal, or maintained in place with protections that limit potential exposure to concrete mortar that has asbestos fibers.

With adherence to the above listed regulations, the recommendations outlined in the Lead and Asbestos Report, and implementation of MM HAZ-1, the potentially significant impact of the Proposed Project related to the creation of a hazards due to improper handling, transportation, and disposal of asbestos would be reduced to less than significant.

Soil and Groundwater Contamination

Arsenic-impacted soils have been identified within the footprint of the GHWTP, as outlined in the Contaminated Soils and Groundwater Technical Memorandum (AECOM/W.M. Lyles Co, 2023b). Certain areas where excavation is planned during project construction contain arsenic concentrations above Construction Worker ESLs, Commercial/Industrial ESLs and established background concentrations. The following recommendations in the Contaminated Soils and Groundwater Testing and Evaluation Technical Memorandum would be implemented with the Proposed Project:[3]

- Worker protections may be required for ground disturbing activities in areas where arsenic concentrations exceed Construction Worker ESLs and background concentrations.
- If excavated, soils with arsenic concentrations above Commercial/Industrial ESLs and background concentrations may not be reused as fill material and must be disposed of offsite. Soils exceeding commercial/industrial ESLs but below background concentrations may be reused as fill material.

As such, soils that have arsenic concentrations above both Commercial/Industrial ESLs and established background concentrations cannot be reused onsite, and must be disposed of offsite at a permitted disposal facility. Historic investigations (AECOM/W.M. Lyles Co, 2023b) demonstrate that arsenic exhibits low solubility and leachability, as demonstrated by STLC and TCLP, respectively, and therefore is unlikely to be characterized as hazardous waste. Therefore, hazardous waste handling and transportation rules and regulations do not apply during soil removal activities. However, if not properly handled, the excavation and disposal of such arsenic-impacted soils could create a hazard to the public or environment through the release of dust or soil tracked offsite and result in a potentially significant impact.

The proposed stormwater low impact development (LID) and stormwater control measures (SCMs) (see Chapter 3, Project Description) would not be completed in areas where elevated concentrations of arsenic were identified, and arsenic-impacted soils, had low solubility (did not move easily when exposed to water). As such, proposed stormwater LID and SCMs would not contribute to the potentially significant impact identified above.

Implementation of MM HAZ-2 (Soil Management Plan) would avoid a significant hazard to the public or environment from excavation and disposal of arsenic-impacted soils by preparing and implementing a soil management plan that will (1) outline soil handling, testing, and disposal requirements; (2) identify the recommendations outlined in the Contaminated Soils and Groundwater Technical Memorandum (AECOM/W.M. Lyles Co, 2023b); (3) identify health and safety procedures for onsite workers, transportation requirements, dust control techniques, and monitoring and reporting requirements; and (4) require maintenance of records of removal and final disposition of soil. All of these requirements would be overseen by an environmental professional with experience in contaminated soil removal and disposal.

With the adherence to applicable federal, state, and local rules and regulations and implementation of MM HAZ-2, the potentially significant impact of the Proposed Project related to the creation of hazards due to the excavation and disposal of arsenic-impacted soils would be reduced to less than significant.

[3] Removal of arsenic-contaminated soil as a remedial action is not included as part of the Proposed Project; as such, the recommendation of "confirmation sampling to confirm removal of arsenic-impacted soils" included in the Contaminated Soils and Groundwater Technical Memorandum is not included.

Hazardous Materials Use

Relatively small amounts of commonly used hazardous substances such as gasoline, diesel fuel, lubricating oil, adhesive materials, grease, solvents, and architectural coatings would be used during construction. These materials are not considered extremely hazardous and are used routinely for both construction projects and structural improvements. These materials would be transported and handled in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, and would be managed in accordance with the federal, state, and local rules and regulations. As discussed in Section 4.9, Hydrology and Water Quality, 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. Additionally, the City's standard construction practice #5 provides for spill prevention during construction. This practice, which is described in Section 3.4.4.4, is provided below:

- Standard Construction Practice #1 (Containment of Work Area [Spill Prevention]). Implement hazardous materials containment measures to prevent fuel, oil, or any other substances from polluting aquatic or terrestrial habitats. Measures may include:
  a. Prepare a spill response plan to allow a prompt and effective response to any accidental spills.
  b. Inform all workers of the importance of preventing spills and the appropriate measures to take in the event of a spill.
  c. Ensure emergency spill kits are available on site at all times.
  d. Locate refueling, maintenance, and staging a minimum distance of 65 feet away from any jurisdictional aquatic resource.
  e. Store hazardous materials within an established containment area and store all gas, oil, or other substance that could be considered hazardous in water-tight containers within secondary containment.
  f. Implement appropriate containment measures to minimize the potential for hazardous spills from heavy equipment such as external grease and oil or from leaking hydraulic fluid, fuel, or oil.
  g. Check all equipment daily for leaks.

The Proposed Project includes upgrades to the water treatment processes. As with the operation of the current treatment processes, operation of the upgraded GHWTP with the Proposed Project would include the use of hazardous materials. The proposed processes include new and enhanced coagulation, flocculation, and high-rate clarification with plate settlers; ozone contact; biological filtration; future granular activated carbon adsorption or similar technology; post-chlorination; and potential future ultraviolet (UV) disinfection. Current hazardous materials used at the GHWTP are listed in Section 4.9.1.1, GHWTP Hazardous Materials Use. Many of the treatment chemicals proposed for the Proposed Project are currently in use and would be retained at the GHWTP. Treatment and other chemicals currently in use at the GHWTP include acetylene, cationic liquid polymer, potassium permanganate, aluminum sulfate (alum), aluminum chlorohydrate (ACH), aluminum orthophosphate, argon gas, carbon aqueous solution, non-ionic polymer, anionic polymer, compressed air, diesel fuel, distilled vinegar, gasoline, motor and lubricating oils, nitrogen gas, non-flammable gas mixture, oxygen gas, propane, sodium hypochlorite, and waste oil. New treatment chemicals would include liquid oxygen, sodium hydroxide, sulfuric acid, calcium thiosulfate, hydrogen peroxide, and polymer for dewatering. Any chemicals used in the treatment process would be certified as meeting the specifications of National Sanitation Foundation International/American National Standard Institute (NSF/ANSI) Standard 60, which is a national standard that establishes the minimum health-effects requirements for the chemicals, chemical contaminants and impurities that are directly added to drinking water. Additionally,

diesel fuel, propane, gasoline, and motor oil are used under existing conditions and would continue to be used with the Proposed Project.

The City of Santa Cruz currently reports hazardous materials to the local CUPA (Santa Cruz County Environmental Health) as required by state and local laws requiring Unified Hazardous Waste and Hazardous Material Management Programs, Hazardous Material Business Plans; Spill Prevention, Control, and Countermeasure Plans; RMPs; and Emergency Response Plans (see Section 4.9.2.2, State Regulatory Framework). The Proposed Project would require an amendment to the Hazardous Materials Management Plan for the GHWTP. Transportation of these hazardous materials and wastes would also be conducted in accordance with federal, state, and local laws (Caltrans and U.S. Department of Transportation). In addition to regulatory requirements, the GHWTP operates under multiple SOPs, as noted in Section 4.9.1.1, Hazardous Materials, under "GHWTP Standard Operating Procedures," including those that define appropriate safety procedures for handling, storing, and disposing of hazardous materials and wastes, and responding to emergencies, such as releases. Additional SOPs would be prepared to cover new operations, such as ozone treatment and UV treatment, as further described in Impact HAZ-2.

With the adherence to applicable federal, state, and local rules and regulations and implementation of standard construction practices and standard operating practices, the construction and operational impact of the Proposed Project related to the creation of hazards due to the routine transport, use, and disposal of hazardous materials would be less than significant.

Mitigation Measures

Implementation of the following mitigation measures would reduce potentially significant impacts related to the creation of hazards due to the improper handling, transportation, and disposal of asbestos and arsenic-impacted soils to less than significant, as described above.

MM HAZ-1 Evaluation and Treatment of Concrete Mortar (Applies to Existing Storm Drain Line within the Utility Corridor). Prior to removal or modification of the existing onsite steel stormwater piping, the concrete mortar will be evaluated for the presence of asbestos. The evaluation will include a survey of the pipeline and appurtenances for the potential presence of asbestos in concrete mortar; this survey will be conducted by a California-licensed asbestos contractor. If necessary, bulk samples will be collected of suspect material for further analysis at a California-licensed analytical laboratory. Any concrete mortar that contains asbestos above applicable regulatory levels will be either be properly abated in accordance with rules and regulations applicable for asbestos removal and disposal, or maintained in place with protections that limit potential exposure to asbestos piping. Asbestos containing materials are defined under federal and state regulations as 1.0% by volume.

MM HAZ-2 Soil Management Plan (Applies to the GHWTP Parcel). A soil management plan (SMP) will be prepared and implemented for management of arsenic-impacted soils that are encountered during construction and excavation activities of the Proposed Project. The SMP will outline soil handling, testing, and disposal requirements, and will follow recommendations outlined in the Contaminated Soils and Groundwater Technical Memorandum. The SMP will also include health and safety procedures for onsite workers, transportation requirements, dust control techniques, and monitoring and reporting requirements. The SMP and subsequent soil removal work will be overseen by an environmental remediation professional with experience in contaminated soil removal and disposal. Records of removal and final disposition of soil, including but not limited to analytical reports, trucking logs, onsite monitoring and field logs, and dump receipts, will be

maintained by the City. Soils that are not disturbed during construction and are located beneath buildings or asphalt are not required to be removed.

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)***

Natural Gas Pipeline

As indicated on Figure 4.9-1, a natural gas pipeline is present along Graham Hill Road, approximately 0.47 miles southeast of the Mt. Hermon staging area and intersecting the eastern edge of the GHWTP parcel, all of the Graham Hill Road right-of-way, and a portion of the alternate sanitary sewer lateral replacement area. The Proposed Project alternate sanitary sewer lateral replacement would be installed parallel to this existing gas pipeline and other features of the Proposed Project could be located in immediate proximity to the pipeline.

Prior to final design of the Proposed Project, the City would contact PG&E, the owner and 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 Proposed Project contractor would contact DigAlert (also known as Underground Service Alert [USA] or 811) at least two days prior to initiating any 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 Proposed Project construction. Additionally, if the excavation is proposed within 10 feet of a high priority utility, California Government Code Section 4216.2(c) requires the owner/operator of a high priority utility[4] to notify the excavator of the existence of the high priority line and set up an onsite meeting to determine actions or activities required. If the utility owner does not contact the excavator, the excavator would reach out to contact the utility owner (Pacific Gas and Electric Company). With the 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. Therefore, the impacts of the Proposed Project would be less than significant.

Hazardous Materials Use

As discussed under Impact HAZ-1, commonly used hazardous substances used during construction at the primary project site and staging areas would be transported and handled in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, and would be managed in accordance with the federal, state, and local rules and regulations. Additionally, Proposed Project implementation of the SWPPP and BMPs, as well as the City's standard construction practice #5 would prevent and minimize incidental spills of petroleum products and hazardous materials during construction.

[4] "High priority subsurface installation" is defined in Section 4216(j) as high-pressure natural gas pipelines with normal operating pressures greater than 415kPA gauge (60psig), petroleum pipelines, pressurized sewage pipelines, high-voltage electric supply lines, conductors, or cables greater than or equal to 60kV that have a potential to ground, or hazardous materials pipelines that are potentially hazardous to workers or the public if damaged.

As also discussed under Impact HAZ-1, operation of the Proposed Project would be similar to current operations that include the use and storage of hazardous materials and hazardous wastes at the GHWTP parcel. Use and storage of hazardous materials and hazardous wastes would not take place during operations at other areas of the project site. Regulations in place for handling and storage of hazardous materials include the requirement to prepare and implement emergency response procedures (including CalARP Plans, SPCC Plans, and HMBPs). Should on-site quantities of regulated substances, including propane, ozone, acetylene, and sulfuric acid, exceed threshold quantities listed in CCR Title 19, Section 2770.5, an RMP would be required per CCR Title 19, Chapter 4.5. Threshold quantities for these regulated substances are provided in Table 4.9-4.

Table 4.9-4. Regulated Substances and Threshold Quantities

Regulated Substance (Tables 1-3 of California Code of Regulations Title 19 Section 2770.5)	Storage Threshold Quantity	Quantity Stored On Site[1, 2]
Acetylene, CAS 74-86-2	10,000 lb	400 cubic feet (27.2 lb) (existing and proposed)
Propane, CAS 74-98-6	10,000 lb	150 gallons (633 lb) (existing and proposed)
Ozone, CAS 10028-15-6	100 lb	N/A as no proposed storage of ozone Threshold volumes would be 769.2 cubic feet or 5,000 gallons
Sulfuric Acid, CAS 7664-93-9	1,000 lb	N/A as regulated conditions do not apply[3] Proposed volume would be 6,500 gallons (99,645 lb)

Notes:

1 Conversions for acetylene and propane from Liquefied Natural Gas Chart, https://fire.lacounty.gov/wp-content/uploads/2019/08/Gas_Conversion_Chart.pdf.

2 Conversion for ozone from aqua-calc online calculator, https://www.aqua-calc.com/calculate/volume-to-weight.

3 Footnote 7 of Table 3 under 19 CCR Section 2770.5, sulfuric acid is only a Regulated Substance if concentrated with greater than 100 pounds of sulfur trioxide, or if the sulfuric acid is in a container with flammable hydrocarbons.

The Proposed Project is not anticipated to exceed threshold quantities of acetylene or propane, as the operations that use these materials would not substantially change. The proposed ozone process involves generation of ozone for immediate injection into the water treatment stream. Excess ozone is immediately destroyed. Generation rates are anticipated at 700 pounds per day, but there would be no ozone storage. The Proposed Project would include storage of sulfuric acid above threshold quantities. However, as defined under Footnote 7 of Table 3 under 19 CCR Section 2770.5, sulfuric acid is only a Regulated Substance if concentrated with greater than 100 pounds of sulfur trioxide, or if the sulfuric acid is in a container with flammable hydrocarbons. As none of these conditions apply, the need to prepare an RMP is not anticipated.

In addition to applicable regulations, GHWTP has SOPs in place related to emergency response procedures, including, but not limited to, Power Outage Response, Plant Evacuation, and Earthquake Response. Additional SOPs would be prepared associated with new treatment procedures, including ozone and UV treatment. For example, the City has prepared safety measures for hazardous materials that will be included in the project design. These measures include safety measures for the ozone and liquid oxygen building, standard operating procedures for handling of ozone and liquid oxygen, and additional safety precautions for liquid oxygen, specifically related to fire safety due to the high flammability of liquid oxygen.

The proposed Ozone Building would have continuous monitoring systems for both ozone and oxygen. Should ozone increase above 0.1 ppm, the HVAC system would increase air exchanges; should ozone increase above 0.3 ppm the system would shut down. Oxygen monitoring would maintain ambient oxygen levels in the Ozone Building

between 25% and 28%. Other chemicals stored on site would be stored with secondary containment, metering equipment, and control panels for the system with automatic shutoffs. With implementation of federal, state, and local rules and regulations, standard construction practices, and existing and updated SOPs, the construction and operational impact of the Proposed Project related to creating 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 would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in a significant impact related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, and therefore, no mitigation measures are required.

Impact HAZ-3	Interfere with Emergency Response Plans (Significance Threshold G). The Proposed Project would not impair implementation of or physically interfere with existing emergency response plan or emergency evacuation plan. ***(Less Than Significant)***

The Proposed Project includes improvements to the City's GHWTP and associated utilities that would ultimately improve the City's facilities. GHWTP manages emergency response procedures with existing SOPs, including earthquake response and emergency shutdown. The improvements to GHWTP included in the Proposed Project would inherently improve the GHWTP resiliency to risk and reduce the potential for an emergency to occur.

Construction of the Proposed Project, specifically sewer upgrades, could impede public rights-of-way along Ocean Street Extension and Graham Hill Road. Construction would be temporary, and traffic control plans would be submitted as necessary and approved through the City or County of Santa Cruz, depending upon the location and associated jurisdiction. See Section 4.13, Transportation (Impact TRA-4) for additional information about traffic control plans. As such, emergency response routes and traffic control would be managed during construction. Operation would not change existing emergency response or evacuation procedures, as operations would be similar to or would improve existing operations.

The Proposed Project would not impair implementation of or interfere with an emergency evacuation plan. As described in Section 4.9.1.2, Other Hazards, the Santa Cruz County Office of Response, Recovery & Resilience serves as the emergency management office for responding to ongoing disasters. 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 Cruz Aware (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 (OR3 2023). Construction or operation of the Proposed Project would not impair implementation of such emergency evacuations, given the implementation of traffic control plans during construction, and given that the Proposed Project would not result in permanent changes to area roadways. As such, impacts of the Proposed Project related to interference with an existing emergency response plan or emergency evaluation plan would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not interfere with an existing emergency response plan or emergency evaluation plan, and therefore, no mitigation measures are required.

4.9.3.4 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 4.0, Introduction to Analysis, and where relevant to this topic. The geographic area for the analysis of cumulative impacts related to hazards and hazardous materials consists of the project site and areas immediately adjacent to the primary project site and staging areas. Therefore, cumulative projects listed in Table 4.0-1 that are in immediate proximity to the project site are relevant to the cumulative analysis, as identified below.

The Proposed Project would not contribute to cumulative impacts related to hazardous emissions or materials within 0.25 miles of an existing or proposed school (Significance Threshold C), hazardous material sites on the Cortese List (Significance Threshold D), aircraft hazards (Significance Threshold E), or interference with an adopted emergency response plan (Significance Threshold F) because it would have no impacts related to these standards, as described above. Therefore, these significance thresholds are not further evaluated.

Impact HAZ-4	Cumulative Hazard 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 routine transport, use, disposal, or accidental release of hazardous materials. ***(Less than Significant)***

The geographic area for the analysis of cumulative impacts related to hazards and hazardous materials consists of the project site and areas immediately adjacent to the primary project sites and staging areas because impacts related to hazards and hazardous materials 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 Newell Creek Pipeline Replacement Project and the GHWTP Concrete Tanks Replacement Project (although construction of this project should be completed before construction of the Proposed Project is initiated) (see Table 4.0-1 in Section 4.0, Introduction to Analyses). Other cumulative projects would be further away from the project site and would not likely combine with or create cumulative impacts.

The only cumulative projects with an overlap of construction schedules with the Proposed Project are the GHWTP Concrete Tanks Replacement Project and the Newell Creek Pipeline Replacement Project. It is not anticipated that any addition to required chemicals would occur beyond existing operational conditions as a result of the Concrete Tanks project implementation, and current BMPs would continue to maintain the safety of transport procedures (City of Santa Cruz 2019b). The Newell Creek Pipeline Replacement Project would not require chemical use during operations of that project (City of Santa Cruz 2022). However, similar to the Proposed Project, construction of these 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 would also include project-specific SWPPPs and BMPs (as discussed in Section 4.9, Hydrology and Water Quality). Such compliance would reduce the potential for a significant hazard to the public or the environment through routine transport, use, disposal, and related accidental release of hazardous materials during construction. Although it is possible that one or more of the other cumulative projects could result in significant impacts related to release of hazardous materials to the environment, it is unlikely that such impacts would combine with the impacts of the Proposed Project or other cumulative projects given the site-specific nature of such 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 routine transport, use, disposal, and related accidental release of hazardous materials and the impact would be less than significant.

Like the Proposed Project, cumulative project sites may be located on or in proximity to properties that have contaminated building materials, soil contamination, and/or groundwater contamination. Although soil and groundwater contamination can spread beyond cumulative project boundaries, such contamination would be assessed, managed, 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. While such a mitigation measure was identified for the Newell Creek Pipeline Replacement Project, the mitigation measure applied to a former Santa Cruz Lumber site that is approximately 4.5 miles from the GHWTP (City of Santa Cruz 2022) and therefore conditions on that site would not combine with the Proposed Project to create a cumulative impact. Overall, the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to contaminated building materials, soil contamination, and/or groundwater contamination.

4.9.4 References

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4.10 Hydrology and Water Quality

This section describes the existing hydrology and water quality conditions of the project site and vicinity, identifies associated regulatory requirements, evaluates potential project and cumulative impacts, and identifies mitigation measures for any significant impacts related to the implementation of the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on review of relevant studies and reports regarding hydrology and water quality that have been prepared for the Proposed Project, 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. One public comment was received from the California Department of Fish and Wildlife related to hydrology and water quality. The comment recommends that stormwater runoff be dispersed rather than concentrated to a stormwater outfall or other receiving waters. The comment also recommends the implementation of low impact development (LID), bioswales, bioretention swales, and incorporation of permeable surfaces throughout the project site.

4.10.1 Existing Conditions

The Proposed Project is composed of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2, and Figure 3-3, in Chapter 3, Project Description.

The Proposed Project is located within the San Lorenzo River watershed on the eastern flank of the San Lorenzo River. The elevation of the GHWTP parcel portion of the project site ranges from approximately 330 feet above mean sea level (amsl) at the northeast end of the plant area to approximately 250 feet amsl at the southwestern end of the plant area. The following section summarizes the existing hydrological and water quality conditions in the vicinity of the project site.

4.10.1.1 Surface Water Resources

Regional Watersheds

The U.S. Geological Survey Watershed Boundary Dataset identifies watersheds within the project vicinity and delineates watersheds according to hydrologic units, identified by name and by hydrologic unit code (HUC) (USGS 2021). At a statewide scale, hydrologic units consist of large regions and subregions draining to a common outlet. At this scale, the project site is located 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.

Although the State Water Resources Control Board (SWRCB) classifies watersheds in a hierarchical system similar to the U.S. Geological Survey 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 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 hydrologic units, hydrologic areas, and hydrologic subareas (HSAs). The project site is located within the San Lorenzo HSA (No. 304.11) (Central Coast RWQCB 2019). The San Lorenzo HSA is among the five watersheds of the region that serve as drinking water sources for areas served by the City of Santa Cruz.

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 2003). Supply facilities along the San Lorenzo River include the Felton Diversion, located upstream of the utility corridor portion of the primary project site, and the Tait Diversion and Coast Pump Station, located downstream of the utility corridor.

The watershed includes the cities 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 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 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.

Water Quality

The RWQCB establishes beneficial uses and characterizes the water quality of surface water bodies based on watershed boundaries that are defined by areas that contain 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 likely 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, with water temperature also a concern. 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 4.10.2.3, Local, for more

[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.

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 (Porter–Cologne Act) is California's statutory authority for the protection of water quality. Under the Porter–Cologne Act, the State must adopt water quality policies, plans, and objectives that protect the State's waters for the use and enjoyment of the people. The Porter–Cologne 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 that are to be protected, water quality objectives that protect those uses, and an implementation plan that accomplishes those objectives. See Section 4.10.2.2 for additional information about the Porter–Cologne 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 4.10-1 lists the beneficial uses of the San Lorenzo River.

Table 4.10-1. Beneficial Uses

Beneficial Use Designation	San Lorenzo River
Municipal and Domestic Supply (MUN)	E
Agricultural Supply (AGR)	E
Industrial Process Supply (PROC)	—
Industrial Service Supply (IND)	E
Groundwater Recharge (GWR)	E
Water Contact Recreation (REC-1)	E
Non-contact Water Recreation (REC-2)	E
Wildlife Habitat (WILD)	E
Cold Freshwater Habitat (COLD)	E
Warm Freshwater Habitat (WARM)	—
Migration of Aquatic Organisms (MIGR)	E
Spawning, Reproduction, and/or Early Development (SPWN)	E
Preservation of Biological Habitats of Special Significance (BIOL)	E
Rare, Threatened, or Endangered Species (RARE)	E
Estuarine Habitat (EST)	—
Fresh Water Replenishment (FRSH)	E
Navigation (NAV)	—
Hydropower Generation (POW)	—
Commercial and Sport Fishing (COMM)	E
Aquaculture (AQUA)	—
Inland Saline Water Habitat (SAL)	—
Shellfish Harvesting (SHELL)	—

Source: Central Coast RWQCB 2019.
Notes: E = existing beneficial use based on identified uses that were attained in a waterbody on or after November 28, 1975, as determined in the Basin Plan. Beneficial uses are regarded as existing whether the waterbody is perennial or ephemeral, or the flow is intermittent or continuous.

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 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 support 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 support 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 4.10-2. 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 4.10-2. Water Quality Impairments

Water Body	2020 and 2022 303(d) List of Water Quality Impairments (Included under SWRCB Integrated Report Category 5)
San Lorenzo River	Benthic community effects, chlordane, chloride, chlorpyrifos, enterococcus, nitrate, polychlorinated biphenyls (PCBs), sedimentation/siltation, sodium, toxicity, and water temperature.

Source: RWQCB 2022.
Note: SWRCB = State Water Resources Control Board.

In addition, in accordance with the State of California Surface Water Treatment Rule, watersheds that are a drinking water source, as is the case for San Lorenzo River and North Coast Watersheds (all in Santa Cruz County), are required to submit to the California Division of Drinking Water (DDW) a sanitary survey with an assessment of water quality that is updated every 5 years. Water quality data for the San Lorenzo River and North Coast Watersheds during the period from 2017—2021 indicate variations in concentrations of total coliform, turbidity, or nitrate concentrations that were consistent with expected seasonal variations (Kennedy Jenks 2023). Nitrates were well below maximum contaminant levels but showing gradual long-term increases. However, overall, the San Lorenzo and North Coast watersheds were characterized as generally providing high water quality water, with some expected variability during the wet season (Kennedy Jenks 2023).

[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.

4.10.1.2 Groundwater Resources

West Santa Cruz Terrace Groundwater Basin

The Proposed Project is located within the West Santa Cruz Terrace Groundwater Basin (Basin No. 3-026), which includes nearly the entire City of Santa Cruz and is bounded to the east by the Santa Cruz Mid-County Groundwater Basin and to the north by the Santa Margarita Groundwater Basin (DWR 2004). The West Santa Cruz Terrace Groundwater Basin covers approximately 12 square miles and is bounded to the south by Monterey Bay and to the north by a series of hills that define the contact of Quaternary and Pliocene deposits (namely the Purisima Formation) (DWR 2004). Elevation ranges from near mean sea level to approximately 100 feet amsl. The basin is drained by a series of streams flowing southward from the mountains. The largest of these streams is the San Lorenzo River. The basin extends northward upstream along the San Lorenzo River. Portions of this basin along with others (see also discussion in Section 4.10.2, Regulatory Framework) were re-delineated for the purposes of groundwater management requirements of the Sustainable Groundwater Management Act (SGMA) (SCMGA 2019). The resultant consolidated Santa Cruz Mid-County Groundwater Basin boundary was intended to include all areas where the stacked aquifer system of the Purisima Formation, Aromas Red Sands, and other units underlying the Purisima Formation constitute the shared groundwater resource to be managed in accordance with SGMA (SCMGA 2019). However, by itself, the West Santa Cruz Terrace basin has little groundwater use and is considered by DWR to be very low priority within the realm of the requirements of SGMA with no requirement to implement a groundwater sustainability plan (GSP) (SCMGA 2019). In addition, the West Santa Cruz Terrace Basin is not significantly connected to the Santa Cruz Mid-County Basin due to the Purisima aquifers not extending westwards into that basin (SCMGA 2019). Water-bearing units in the West Santa Cruz Terrace basin consist primarily of the Purisma Formation, terrace deposits, and alluvium along the San Lorenzo River. The Purisima Formation is a thick sequence of highly variable sediments ranging from marine fossiliferous rocks near its base to continental deposits in its upper portion (DWR 2004). Recharge is from deep percolation of rainfall, especially near the upper areas of the San Lorenzo River, and other streams crossing the basin.

Santa Cruz Mid-County Groundwater Basin

The Santa Cruz Mid-County Groundwater Basin is located east of the West Santa Cruz Terrace Groundwater Basin at the northern end of the Central Coast hydrologic region, extending from the Santa Cruz Mountains to the Pacific Ocean, and from Live Oak to La Selva Beach along the Pacific coast. The Mid-County Basin includes a portion of the City of Santa Cruz, all of the City of Capitola, and unincorporated areas of Santa Cruz County. DWR classified the basin as in critical overdraft because seawater intrusion is actively occurring, largely from long-term overdraft of the basin having lowered groundwater levels along the coast (SCMGA 2019). The City of Santa Cruz has a groundwater well field, called the Beltz system, that pumps groundwater from the Mid-County Basin.

Santa Margarita Groundwater Basin

The Santa Margarita Groundwater Basin is a 34.8-square-mile basin located to the north of the West Santa Cruz Terrace Groundwater Basin. The Basin forms a roughly triangular area that extends from Scotts Valley in the east, to Boulder Creek in the northwest, to Felton in the southwest. The City of Santa Cruz does not pump any groundwater from the Santa Margarita Groundwater Basin; however, it is an indirect user of groundwater in the basin because the surface water it diverts from San Lorenzo River partially comprises baseflows that are supported by Santa Margarita Basin (SMGA 2021). The City also owns and operates the Loch Lomond Reservoir that overlies the Santa Margarita Groundwater Basin and provides some surface water inflows to the basin.

4.10.1.3 Flood Hazards

Flood mapping by the Federal Emergency Management Agency indicates that the GHWTP parcel portion of the project site is not within a Special Flood Hazard Area (100-year flood zone) (FEMA 2023). However, approximately 250 feet of the utility corridor portion of the primary project site, the alignment west of Ocean Street Extension, is located within the 100-year flood zone (i.e., 1% annual chance of flooding) for San Lorenzo River. This utility corridor includes the existing underground storm drain line that discharges to the San Lorenzo River.

Flood hazards can also be associated with inundation due to dam failure. The project site is located downstream of the Newell Creek Dam which is owned and operated by the City and regulated under the jurisdiction of the California Department of Water Resources, Division of Safety of Dams (DSOD). Newell Creek Dam is classified as an Extremely High Hazard dam per DSOD regulations, and a catastrophic failure of this dam would result in flood hazards downstream in the San Lorenzo Valley and within the City, primarily the downtown area (County of Santa Cruz 2021). There have been no previously reported dam failures or emergency incidents for the Newell Creek Dam (County of Santa Cruz 2021). In 2007, the DSOD conducted a seismic stability analysis of Newell Creek Dam that concluded that "the dam is safe for continued use," and later confirmed that the analysis was still valid in 2019 (DSOD 2019).

4.10.1.4 Project Site Conditions

GHWTP Parcel

The City-owned GHWTP parcel located at 715 Graham Hill Road is the site of the existing GHWTP that is developed and largely covered in impervious surfaces in the developed portions of the parcel with undeveloped and vegetated land area around the northern, western, and southwestern edges of the parcel. The GHWTP parcel is located in the upper portion of a large west-facing slope adjacent to the San Lorenzo River. The majority of the proposed building area on the GHWTP parcel is situated on an upper building pad. A smaller portion of the proposed building area is located on a lower building pad adjacent to the Concrete Tanks Project, which is under construction. The entire site includes approximately 127,109 square feet of impervious surfaces. Slopes are inclined steeper than 1:1 (horizontal:vertical) in some areas of the GHWTP parcel.

Drainage control improvements are limited due to the age of the infrastructure (constructed in 1960), and discharges to San Lorenzo River via a dedicated storm drain line in the utility corridor, described below. Overtime new drop inlets and drainage control features have been installed at the GHWTP. As discussed in Section 4.7, Geology and Soils, the site conditions require that stormwater not be discharged on slopes because of stability issues. A v-notch ditch was installed a number of years ago to prevent sheetflow downhill, the Concrete Tanks Project also installed a number of new drop inlets and stormwater lines to collect stormwater and to convey it all off site via the storm drain line to the San Lorenzo River.

Utility Corridor

The utility corridor spans between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension. This area contains the existing underground 18- to 24-inch storm drain line, dedicated to the GHWTP, that discharges directly to the San Lorenzo River. The existing stormwater collection system, which was installed in 1960, is made of steel pipe with concrete mortar. The City has an easement over the utility corridor; existing surface runoff occurs as overland sheetflow.

Graham Hill Road Right-of-Way

The Graham Hill Road right-of-way spans between just north of Mosswood Court and just south of Lyle Way. The two-lane north-south road has generally 11-foot lane widths with less than 2-foot to 3-foot wide shoulders and no curb and gutter systems. Stormwater runoff flows as sheetflow or within shoulder ditches. This area contains a segment of the County's existing 12-inch gravity sewer in Graham Hill Road and other exiting utilities.

Alternate Sanitary Sewer Lateral Replacement Area

The alternate sanitary sewer lateral replacement area spans from the southwest corner of the GHWTP parcel at Ocean Street Extension and along Ocean Street Extension to the City Public Works Department maintained sanitary sewer connection at Graham Hill Road. Ocean Street Extension is paved with no existing drainage control improvements, other than informal drainage features installed by private landowners. This area contains an underground segment of the City's existing 4-inch sewer lateral located in Ocean Street Extension.

Ocean Street Extension Staging Area

The Ocean Street Extension staging area for the Proposed Project is located on Ocean Street Extension, a paved road with no curb and gutter improvements; however, there is a drop inlet on the site that drains to the San Lorenzo River. This area currently being used for temporary staging and laydown of equipment and/or storage.

Mt. Hermon Road Staging Area

The Mt. Hermon Road staging area is located at the northern intersection of Graham Hill Road and Mt. Hermon Road. This area has been previously used for temporary staging and laydown of equipment and/or storage.

4.10.2 Regulatory Framework

4.10.2.1 Federal

Clean Water Act

The CWA, as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality (33 USC 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.[3] The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and support the 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 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

[3] 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.

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.

- 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 4.10.2.2, 4.10.2.2 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 4.10.2.3, Local, for the City's SWMP.
- 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 U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA). Section 4.4, 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, the U.S. Army Corps of Engineers, 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 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 CFR 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.

4.10.2.2 State

Porter–Cologne Water Quality Control Act

The Porter–Cologne 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.[4] The Porter–Cologne 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 Division of Drinking Water

In 2014, the responsibility of regulating California's drinking water and water quality programs was transferred from the Department of Public Health to the State Water Board. The DDW was set up to provide that oversight within the State Water Board. DDW regulates public water systems; oversees water recycling projects; permits water treatment devices; supports and promotes water system security; and performs a number of other functions. Drinking water-related statutes are from the Corporations Code, Education Code, Food and Agricultural Code, Government Code, Health and Safety Code, Public Resources Code, and Water Code. Regulations are from Title 17 and Title 22 of the California Code of Regulations. DDW implements the Safe Drinking Water Act and California regulations applicable to public water systems. DDW will be responsible for considering the issuance of a Domestic Water Supply Permit Amendment for the Proposed Project.

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."

[4] "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 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 4.10-1. Of particular importance to the Proposed Project is the Basin Plan's water quality objective for turbidity, which states (page 31) 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%" (although there are allowable zones of dilution within which higher concentrations can be tolerated as defined on a case-by-case basis) (Central Coast RWQCB 2019).

Other water quality objectives that are pertinent to the Proposed Project activities include oil and grease, toxicity, chemical constituents, organic chemicals, and inorganic chemicals.

Construction General Permit (SWRCB Order No. 2022-0057-DWQ,)

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 Order WQ 2022-0057-DWQ) to avoid and minimize water quality impacts attributable to such activities. The Order will become effective September 1, 2023. 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.

Statewide General NPDES Permit for Drinking Water System Discharges (Order WQ 2014-0194-DWQ)

In accordance with the Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water, discharges from drinking water systems are covered by the Statewide General NPDES Permit for Drinking Water System Discharges (Order WQ 2014-0194-DWQ). This order provides regulatory coverage for short-term or seasonal planned and emergency (unplanned) discharges resulting from a water purveyor's essential operations and maintenance activities. Planned discharges include regularly scheduled, automated, or

non-regularly scheduled activities that must take place to comply with mandated regulations and that the water purveyor knows in advance will result in a discharge to surface water. Emergency discharges include unplanned discharges that occur due to facility leaks, system failures, operational errors, or catastrophic events for which the water purveyor is not aware of the discharge until after the discharge has commenced. Planned and emergency discharges may occur directly, through a constructed storm drain or through another conveyance system, to waters of the United States. Discharges authorized by this Order are composed solely of water that is dedicated by drinking water facilities for the primary purpose of providing safe and reliable drinking water. Additionally, discharges authorized under this Order are determined to not adversely affect or impact beneficial uses of the receiving waters when properly managed through best management practices. Such discharges include, but are not limited to, discharges from supply wells, transmission systems, water treatment facilities, water distribution systems, and storage facilities. Any discharges that are likely to cause or contribute to an exceedance of a water quality objective other than those granted an exception under the State Water Board Resolution 2014-0067, are not authorized under this Order.

Post-Construction Stormwater Management Requirements

The Central Coast RWCQB adopted Resolution No. R3-2013-0032, which approved post-construction stormwater management requirements for development projects in the Central Coast region. The requirements apply to small MS4s subject to post-construction requirements of the Phase II Municipal General Permits and are intended to apply to development projects, in order to protect watershed processes so that beneficial uses of receiving waters affected by stormwater management are maintained and, where applicable, restored. The requirements focus on LID and other types of control measures. LID treatment systems implement harvesting and use, infiltration, and evapotranspiration. LID is an effective approach to managing stormwater to minimize the adverse effects of urbanization and development on watershed processes and beneficial uses resulting from changes in stormwater runoff conditions. LID strategies can achieve significant reductions in pollutant loading and runoff volumes as well as greatly enhanced groundwater recharge rates. The proper implementation of LID techniques results in greater benefits than single purpose stormwater and flood control infrastructure.

Sustainable Groundwater Management Act

In 2014, California enacted the "Sustainable Groundwater Management Act" (California Water Code Section 10720 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 basins that are subject to critical conditions of overdraft. GSPs were required to be submitted to the DWR by January 31, 2022, for all other high- or medium-priority basins. By itself, the West Santa Cruz Terrace basin has little groundwater use and is considered by DWR to be a very low priority within the realm of the requirements of SGMA with no requirement for a GSP. However, portions of this basin along with all or portions of the Pajaro Valley Subbasin, Purisima Highlands Subbasin, and Santa Margarita Groundwater Basin were re-delineated for the purposes of groundwater management requirements of SGMA and included for discussion as a neighboring subbasin as part of the Santa Cruz Mid-County Basin GSP, although the West Santa Cruz Terrace Basin is not significantly connected to the Santa Cruz Mid-County Basin (SCMGA 2019). The consolidated Santa Cruz Mid-County Groundwater Basin boundary was intended to include all areas where the stacked aquifer system of the Purisima Formation, Aromas Red Sands, and other units underlying the Purisima Formation constitute the shared groundwater resource to be managed in accordance with SGMA (SCMGA 2019). A GSP has also been prepared for the neighboring Santa Margarita Groundwater Basin to the north (SMGA

2021). The project site, however, is located outside of the both the Santa Cruz Mid-County Groundwater Basin and the Santa Margarita Groundwater Basin.

4.10.2.3 Local

The majority of the Proposed Project relates to production, treatment, storage, and transmission of water supplies, and therefore, as indicated above, these facilities are generally legally exempt under California Government Code Section 53091(d) and (e) from the City of Santa Cruz and County of Santa Cruz building and zoning ordinances. The Proposed Project evaluated in this EIR includes facilities dedicated to storage, treatment, and transmission of water; therefore, those facilities are exempted from City and County building and zoning ordinances. However, related facilities that serve functions other than those listed above, such as the Proposed Project's Operations and Filter Building located within City limits, remain subject to the City's zoning and building requirements. Local requirements related to stormwater and wastewater are designed for compliance with federal and state requirements identified in the prior section and will be implemented for the Proposed Project, where relevant.

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 MS4 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 including Chapter 18.45 Excavation and Grading Regulations), 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, last revised March 2014. 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. Municipal Code 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.

The March 2014 Manual for Storm Water Best Management Practices for Private and Public Development Projects has a tiered approach to BMP requirements based on the project's new, replaced, and net impervious surface area (City of Santa Cruz 2014). Projects that include more than 22,500 square feet (collectively over the entire project site) of new and replaced impervious area, which applies to the Proposed Project, are required to meet the Tier 4 Mandatory Requirements. The following elements are required:

- In addition to the Runoff Reduction, Water Quality and Runoff Retention requirements, projects are required to manage the following peak storm water runoff: Post-development peak flows, discharged from the site, shall not exceed pre-project peak flows for a 10-year 24-hour storm event. The City may require additional peak flow management in sensitive flooding areas.
- A Storm Water Control Plan shall be submitted with plan designs demonstrating that the Regulated Project meets the Water Quality Treatment, Runoff Retention and Peak Management Performance Requirements. The Storm Water Control Plan shall follow the outline included in Appendix B of the Manual.

City of Santa Cruz Municipal Codes Regarding Wastewater Discharge

Chapter 16.08 ("Sewer System Ordinance") of the City's Municipal Code regulates discharge to sanitary sewer and requires that all wastewater be discharged to public sewers, with the exception of graywater as allowed by Municipal Code Chapter 16.08. Section 16.08.160 requires wastewater discharge permits for all significant users that discharge wastewater. Permit conditions include but are not limited to: city and federal limits of wastewater constituents and characteristics, limits on the rate and time of discharge, limits on the daily average and maximum discharge volumes, and requirements for installation of technology to comply with pretreatment standards or other wastewater discharge requirements compliance monitoring and schedules rates. The Proposed Project may require a Wastewater Discharge Permit Amendment under the City's Municipal Code.

County of Santa Cruz Design Criteria

Development within Santa Cruz County is required to meet the County's Department of Public Works Design Criteria containing standards for the construction of streets, storm drains, sanitary sewers, water systems, and driveways. These requirements include measures pursuant to Section 16.22, "Erosion Control", of the Santa Cruz County Code. Part 3 of the Design Criteria pertains to stormwater requirements and Part 4 to sanitary sewer design.

The Proposed Project would require a Sewer Connection Permit and Waste Discharge Permit under Chapter 7.38, Sewage Disposal, of the County Code, if the Proposed Project connects to the County sewer main in Graham Hill Road. Such a connection in Graham Hill Road is the preferred sewage disposal option that the City is pursuing (see Chapter 3, Project Description, for additional description).

4.10.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of 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.

4.10.3.1 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.

4.10.3.2 Analytical Methods

Potential impacts related to hydrology and water quality were identified based on consideration of the Proposed Project characteristics, the location and characteristics of the project site, and applicable requirements and regulations. Specifically, the following analysis considers whether the Proposed Project would directly or indirectly cause hydrologic and water quality impacts taking into account state-mandated construction requirements, as specified in the NPDES Construction General Permit in addition to the other regulatory requirements. 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 regulations and standard construction practices (see below), impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts related to water quality. Standard construction practices #1 (erosion control), #2 (restoration), #3 (wind erosion control), #4 (trash control), #5 (spill prevention), and #10 (in-channel erosion and sedimentation control) apply to the Proposed Project. Where applicable, these practices and their effectiveness in avoiding or minimizing impacts on water quality are described in Section 4.10.3.3, Project Impact Analysis.

4.10.3.3 Project Impact Analysis

Impact HYD-1	Surface Water Quality Standards and Waste Discharge Requirements (Significance Thresholds A and E). Construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. 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)***

Adverse effects 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 ground disturbances associated with construction activity (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas, and/or improper handling of hazardous materials) and the long-term effects of operation of the proposed facility improvements (e.g., alteration of drainage patterns, use/handling of hazardous materials, and/or increases in impervious surfaces), which can also lead to adversely affecting beneficial uses of existing surface waters.

Construction

The Proposed Project would involve earthwork activities to prepare the various components of the primary project site for the proposed construction (i.e., GHWTP parcel, utility corridor, and alternative sanitary sewer replacement area).[5] Excavated materials would be temporarily stockpiled in identified staging areas, and either reused onsite or hauled off site. 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, as further described herein.

The primary potential pollutant of concern associated with construction activity is sediment (i.e., high turbidity), already a known impairment of San Lorenzo River, generated from site preparation, grading and excavation, and soil stockpile activities that expose soils to potential erosion from the effects of wind or rain. Such activities would take place at the GHWTP parcel, along the utility corridor if the existing storm drain line is replaced or rehabilitated, and along the alternative sanitary sewer replacement area if the City's sewer line is replaced. If not properly controlled, potential increases in sedimentation/siltation from construction activities on the site could adversely affect water quality of receiving surface waters; namely, the San Lorenzo River. In addition to sediment, other pollutants associated with construction activity could include heavy metals, arsenic, oil/grease, fuels, debris/trash from construction-related materials, and concrete curing compounds (see further discussion of arsenic in onsite soils in Section 4.9, Hazards and Hazardous Materials). Sediment can also be a carrier for these pollutants if they are released to soils. Basin Plan for the Central Coastal Basin (RWQCB 2019) objectives for organic contaminants (e.g., fuels, paints, solvents) are generally the same as the respective drinking water quality standards (i.e., maximum contaminant levels), and the Basin Plan objectives for debris and certain other compounds are qualitative in nature, requiring that release of such pollutant sources not adversely impact the beneficial uses of downstream water bodies (e.g., impairing water quality to the extent that it adversely affects habitat, water quality, water supply, and other beneficial uses). Without adequate precautions, wind and rain events that occur during construction activities could generate pollutants or mobilize sediment such that those pollutants contribute to the

[5] It is unlikely that the proposed traffic calming measures along the Graham Hill Road right-of-way would require earthwork activities.

water quality degradation of receiving waters or violate Basin Plan objectives that can lead to adverse effects on existing beneficial uses.

The ground disturbing activities would include tree and vegetation removal in proposed development areas, demolition of existing structures, excavation for infrastructure removal and foundation construction, trenching, and construction of new buildings and associated equipment and utilities. If not managed appropriately, the excavated soils could be exposed to the effects of wind and water erosion. As part of the City's standard construction practices, which are included in the Proposed Project, the contractor would be required to implement erosion control and water quality BMPs to avoid or substantially reduce the potential for pollutant contributions to San Lorenzo River, the closest water body to the project site. 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 3.4.4.4 and provided below:

- Standard Construction Practice #1 (Erosion Control). Implement and maintain effective erosion and sediment control measures at all times of the year. Measures may include:
  a. Install silt fencing, fiber rolls or straw wattles, and/or rice straw bales on slopes and along limits of work/construction areas to break up and filter surface runoff.
  b. Utilize additional erosion control including native duff, jute netting, etc.
  c. Utilize additional sediment control including fencing, dams, barriers, berms, traps, and associated basins.
  d. Cover of stockpiled spoils.
  e. Install rolling dips and revegetation on temporary accessways.
  f. Physical stabilization/revegetation of disturbed or graded areas including staging areas, prioritizing the use of native species for revegetation where appropriate.
  g. Install sediment containment measures for all active and inactive stockpiles, spoil disposal sites, concrete wash sites, stabilization structures, and other debris areas, such as Visqueen plastic sheeting, fiber or straw wattles, gravel bags, and hydroseed.
  h. Locate construction storage areas outside of any stream channel, and a minimum distance of 65 feet away from any jurisdictional aquatic resource.
  i. All erosion and sediment control materials shall avoid the use of plastic mesh.
  j. Prior to forecasted and following all rain events, all erosion and sediment control devices shall be inspected for their performance and repaired or replaced immediately if they are found to be deficient.
- Standard Construction Practice #2 (Restoration). Implement post-construction restoration on temporarily disturbed areas such as staging, new access routes, or work areas. Post-construction restoration may include:
  a. De-compact soils if necessary.
  b. Restore disturbed natural communities by replanting native species appropriate for the site, such as from native riparian, wetland, or upland communities. Planted material may include native seed mixes, pole cuttings, and/or container stock as appropriate.
- Standard Construction Practice #3 (Wind Erosion Control). Implement wind erosion control measures as necessary to prevent construction-related dust generation. Measures may include:
  a. Water active construction areas to control fugitive dust.
  b. Apply hydroseed and/or non-toxic soil binders to exposed cut and fill areas after cut and fill operations.
  c. Cover inactive storage piles.

d. Cover trucks hauling dirt, sand, or loose materials off site.
e. Install appropriately effective track-out capture methods at the construction site for all exiting vehicles.

- **Standard Construction Practice #4 (Trash Control).** Implement housekeeping measures to manage trash and debris pollution. These measures may include:
  a. Use covered trash containers.
  b. Clean up trash from the work site daily and before an extended period of no construction activity, including weekends.
  c. Ensure all trash and debris is removed from the work area at the end of construction activities.
- **Standard Construction Practice #5 (Containment of Work Area [Spill Prevention]).** Implement hazardous materials containment measures to prevent fuel, oil, or any other substances from polluting aquatic or terrestrial habitats. Measures may include:
  a. Prepare a spill response plan to allow a prompt and effective response to any accidental spills.
  b. Inform all workers of the importance of preventing spills and the appropriate measures to take in the event of a spill.
  c. Ensure emergency spill kits are available on site at all times.
  d. Locate refueling, maintenance, and staging a minimum distance of 65 feet away from any jurisdictional aquatic resource.
  e. Store hazardous materials within an established containment area and store all gas, oil, or other substance that could be considered hazardous in water-tight containers within secondary containment.
  f. Implement appropriate containment measures to minimize the potential for hazardous spills from heavy equipment such as external grease and oil or from leaking hydraulic fluid, fuel, or oil.
  g. Check all equipment daily for leaks.
- **Standard Construction Practice #10 (In-Channel Erosion and Sedimentation Control).** Implement streambed and bank protection measures for construction activities that are in or adjacent to streams and drainages. These measures may include:
  a. Avoid activities in any active flowing channels when possible.
  b. Time work during the low flow season (June–October) when possible, to avoid work in a wetted channel.
  c. Utilize equipment or methods that do not require access in the channel.
  d. If work within a wetted channel cannot be avoided, isolate and temporarily bypass flowing water around work area before beginning work.
  e. Select appropriate equipment to minimize disturbances such as tracked or wheeled vehicles depending on site conditions.
  f. Use "floating" platforms to distribute the weight of heavy equipment during mobilization in saturated soils.

Earthwork and grading activities on relatively steep sloped areas can also have increased potential for exposing soils to the effects of erosion. However, non-exempt portions of the Proposed Project would also be subject to Chapter 18.45, Excavation and Grading Regulations, of the City Municipal Code that includes grading requirements such as erosion control (18.45.110), drainage and terracing (18.45.100), and winter (rainy season) grading requirements (18.45.040). All of these grading requirements would ensure that BMPs are incorporated to all phases of construction work that are protective of exposed soils such that the potential for sedimentation and offsite discharge of pollutants is minimized.

Implementation of these measures as part of the Proposed Project 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 the San Lorenzo River associated with the possible replacement or rehabilitation of the storm drain would avoid the active channels, where possible, or work would be timed during the low flow season. 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 provided 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 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 an 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 the Proposed 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 the project site.

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 construction impact of the Proposed Project related to water quality standards and objectives, waste discharge requirements and degradation of surface or groundwater quality would be less than significant.

Operation and Maintenance

Stormwater. The Proposed Project would alter the existing drainage patterns through the construction of new and replaced impervious surfaces. The Proposed Project would include 85,269 square feet of net impervious surfaces (including new and replaced impervious area), which is over the threshold of 22,500 square feet set by the City, thus requiring the Project to adhere to the City's Tier 4 Mandatory Requirements in the City's Storm Water BMP Manual, as described in Section 4.10.2.3, Local. Tier 4 requires conformance with the requirements of: Tier 1-Site Design and Runoff Reduction, Tier 2-Water Quality (WQ) Treatment, Tier 3-Runoff Retention, and Tier 4-Peak Management. In general, these requirements translate to the following:

Tier 1: Use of appropriate LID BMPs to reduce runoff to on- and off-site areas;

Tier 2: Collection and treatment of the 85th percentile 24-hour rainfall event depth (1.35 inches) runoff volume via rainwater harvesting, infiltration, and/or evapotranspiration;

Tier 3: Retain runoff on-site from the 95th percentile 24-hour rainfall event (2.25 inches); and

Tier 4: Route 10-year 24-hour rain event and detain a volume in onsite facilities such that peak flows discharging off-site do not exceed the pre-project runoff flowrate discharged by a 10-year, 24-hour rain event.

Conformance with these requirements are usually a matter of selecting and sizing LID and stormwater control measures (SCMs) to satisfy minimum requirements. However, for the Proposed Project, the presence of steeply sloped areas, buildings, paved roadways, paved parking areas, existing facilities, impermeable soils, and subsurface process-related utilities and tanks, limits the areas available and/or suitable for construction of LID BMPs. A site-specific hydrology study was performed to evaluate site requirements and to develop the proposed LID and SCMs needed to meet those requirements (AECOM 2023). Onsite infiltration testing was also conducted by AECOM in April 2023, which found that infiltration onsite is technically infeasible. Responsive to these site limitations, the proposed SCMs include use of permeable pavement areas with underlying storage galleries as permanent stormwater control features to be included in the final design.

The planned SCMs are capable of meeting Tier 1, 2 and 4 requirements; however, the planned site improvements would require on the order of 13,649 cubic feet of detention storage volume to comply with Tier 3, which is infeasible due to site conditions, including soil types with limited infiltration, space constraints, and geotechnical hazards. However, the City's Storm Water BMP Manual allows for alternative compliance for projects with technical infeasibility, as is the case for the Proposed Project. Therefore, alternative compliance is proposed by providing ten percent (10%) of the Proposed Project's Equivalent Impervious Surface Area dedicated to retention-based SCMs consistent with City requirements. The LID water quality features, in combination with required stormwater control

requirements, would be protective of water quality consistent with City stormwater requirement, Basin Plan policies, and water quality objectives.

Drinking Water Quality and Hazardous Materials Use. Operationally, the Proposed Project would continue to provide water treatment and potable water supplies for the City with new and upgraded water treatment and related processes. Many of the chemicals that would be associated with the treatment processes are already currently in use and would be retained at the site. New chemicals that would be part of the Proposed Project include liquid oxygen, sodium hydroxide, sulfuric acid, calcium thiosulfate, hydrogen peroxide, and polymer for dewatering. Any chemicals used in the treatment process would be certified as meeting the specifications of National Sanitation Foundation (NSF) International/American National Standard Institute (NSF/ANSI) Standard 60, which is a national standard that establishes the minimum health-effects requirements for the chemicals, chemical contaminants and impurities that are directly added to drinking water. New facilities for chemicals, unloading areas, and dosing pumps would be designed for full compliance with current safety codes and regulations, with provisions for emergency eye wash/ shower stations, chemical spill containment areas, separation between acids and bases, and fire-suppression systems in accordance with applicable regulatory requirements including those instituted by the DDW.

Additionally, the City submits Hazardous Materials Business Plans to Santa Cruz County Environmental Health Services, which is the Certified Unified Program Agency within the geographic boundaries of the County (including all four cities), as described in Section 4.9, Hazards and Hazardous Materials. Santa Cruz County Environmental Health Services is responsible for enforcing State statutes and regulations, as well as the local ordinance (County Code Chapter 7.100) pertaining to the storage, use, and disposal of hazardous materials and waste. Compliance with standard spill prevention and containment regulations would minimize the potential for spills of hazardous materials impacting nearby water bodies during operations. An amendment to the City's Hazardous Materials Management Plan for the GHWTP would be required for the Proposed Project to comply with the above requirements.

Wastewater Discharge. As discussed in Chapter 3, Project Description, the Proposed Project is estimated to increase wastewater flow over existing conditions by up to 200 gallons per minute (gpm) during peak conditions for a total estimated peak flow of up to approximately 350 gpm. There are two options being considered to improve the sewer capacity for discharges from the GHWTP including (1) connecting to the County's existing 12-inch sewer line within Graham Hill Road (preferred by the City) and building a small sanitary lift station at the GHWTP, if needed, or (2) replacing the existing sewer line in Ocean Street Extension with one of larger capacity (6-inch sewer lateral). Regardless of the option selected, the Proposed Project and associated increase in peak discharges would be required to meet all requirements for discharges being received by the City of Santa Cruz Wastewater Treatment Facility and the facilities' existing NPDES Discharge Permit. This could be accomplished with an amendment to the City's Wastewater Discharge Permit for the GHWTP for the upgraded facility, or with a Sewer Connection Permit and Waste Discharge Permit from the County if the connection to the County's sewer line is pursued.

Conclusion. With implementation of the required LID BMPs and stormwater control features consistent with the City's stormwater requirements and Basin Plan objectives, along with continued conformance with current drinking water regulations for public agencies and NPDES discharge requirements, the operational impact of the Proposed Project related to water quality standards and objectives, waste discharge requirements, and degradation of surface or groundwater would be less than significant.

Impact HYD-2	Decrease Groundwater Supplies, Interfere with Groundwater Recharge, or Conflict with Groundwater Plan (Significance Thresholds B and E). Construction and operation of the Proposed Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that sustainable groundwater management of the basin would be impeded or such that conflict or obstruction of a sustainable groundwater management plan would occur. ***(Less than Significant)***

While the City's water supply system relies primarily on diverted surface water sources, the system is supplemented by groundwater wells in the Santa Cruz Mid-County Groundwater Basin (referred to as "Beltz wells") in the unincorporated portion of the County. However, implementation of the Proposed Project is not anticipated to require additional staffing compared to existing conditions and therefore additional water supplies would not be required to serve such staffing. In addition, implementation of the Proposed Project would support conjunctive management of surface and groundwater supplies to improve water supply. In general, this involves the storage of treated surface water in local aquifers or delivery to regional water agencies during times when water is available, facilitating better long-term management of groundwater supplies. Therefore, operationally the Proposed Project would not be expected to have a substantive demand for groundwater supplies. Construction may require water supply; however, this demand would be temporary and sourced primarily from surface water sources.

The project site is already developed and includes large areas of impervious surfaces. The proposed improvements at the GHWTP would increase the amount of impervious surfaces with a net increase of 22,404 square feet (from 127,109 under existing conditions to 149,513 square feet in the proposed conditions); however, the Proposed Project would be required to meet the City's stormwater requirements, as described in Impact HYD-1. These requirements include implementing LID BMPs and stormwater control features that encourage infiltration onsite, where appropriate and feasible, such as percolation basins or underdrains that would minimize the amount of runoff that is discharged offsite and allow for infiltration.

In addition, the project site is located in the West Santa Cruz Terrace Groundwater Basin, which has little groundwater use, is not a source of water supply for the City, is considered by DWR to be a very low priority in accordance with SGMA and does not require a GSP (SCMGA 2019). While the West Santa Cruz Terrace Groundwater Basin is not significantly connected to the Santa Cruz Mid-County Basin due to the Purisima aquifers not extending westwards into that basin (SCMGA 2019), this basin is discussed in the GSP as a neighboring basin to the Santa Cruz Mid-County Basin. While the Santa Cruz Mid-County Basin GSP does not apply to the project site and its location in the West Santa Cruz Terrace Groundwater Basin, the Proposed Project would include improvements that would be used to enhance conjunctive water supply uses, which would benefit long-term water supply management and support groundwater recharge in the Santa Cruz Mid-County Basin via aquifer storage and recovery and water transfers and exchanges. The Proposed Project would also benefit the Santa Margarita Groundwater Basin in similar fashion. In addition, the City's operation of Loch Lomond Reservoir, which is located in Santa Margarita Groundwater Basin, provides some surface water inflows to the basin (SMGA 2021). Therefore, the Proposed Project would support the implementation of Santa Cruz Mid-County Groundwater Basin GSP and the Santa Margarita Groundwater Basin GSP, both of which identify aquifer storage and recovery and water transfers and exchanges as identified projects.

Therefore, considering the water demands of the Proposed Project, the main source of water supply being diverted surface water, the adherence to stormwater requirements, where feasible, the characteristics of the underlying groundwater basin, and the benefits for groundwater recharge, the impact of the Proposed Project related to

decreasing groundwater supplies, interfering with groundwater recharge, or conflicting with a GSP would be less than significant.

Impact HYD-3	Alteration to the Existing Drainage Pattern of the Site Area (Significance Threshold C). Construction and operation of 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: (a) result in substantial erosion or siltation on or off site; (b) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; (c) 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 (d) impede or redirect flood flows. ***(Less than Significant)***

As discussed in Impact HYD-1, the Proposed Project would include construction of new structures and facilities on the site and would alter existing drainage patterns. The highest potential for erosion or transport of silt would occur during construction, which would be addressed by implementation of the City's standard construction practices and the NPDES Construction General Permit requirements pertaining to construction erosion control BMPs that would be implemented during all phases of construction. Once construction is complete, disturbed areas would be restored and predominantly covered in impervious surfaces with stormwater LID BMPs to manage stormwater runoff and stormwater quality. These stormwater control features would be consistent with City requirements, which are designed to minimize the potential for erosion and siltation. The required LID BMPs and stormwater control features, consistent with City requirements, would provide the required detention volumes to allow for increases in stormwater runoff to be managed such that stormwater-related flooding on- or offsite would be minimized and the capacities of the proposed drainage system sufficient. As noted in Impact HYD-1, the planned SCMs are capable of meeting Tier 1, 2 and 4 requirements, and alternative compliance (i.e., providing 10% of the Proposed Project's Equivalent Impervious Surface Area dedicated to retention-based SCMs) is proposed to meet Tier 3 requirements. Implementation of these drainage control requirements would reduce post-development runoff to be no more than pre-development conditions. As a result, the impact of the Proposed Project related to alteration of drainage patterns resulting in the potential for erosion, polluted runoff, stormwater-related flooding on- or off-site, or inadequate stormwater system capacities would be less than significant.

According to flood hazard mapping compiled by the Federal Emergency Management Agency, with the exception of approximately 250 feet of the subsurface utility corridor, the project site is located outside of the 100-year flood hazard zone (FEMA 2023). In addition, the GHWTP parcel is already developed with above ground improvements and would be redeveloped with implementation of the Proposed Project in a manner that would not substantively alter flood flows in the unlikely event they should occur at the site. As a result, the Proposed Project would result in no impact related to impeding or redirecting flood flows.

Impact HYD-4	Flood, Tsunamis, and Seiche Zones (Significance Threshold D). Construction and operation of the Proposed Project in flood hazard, tsunami, or seiche zones would not risk release of pollutants due to project inundation. ***(Less than Significant)***

The GHWTP parcel portion of the project site is not within a Special Flood Hazard Area (100-year flood zone) (FEMA 2023). Approximately 250 feet of the utility corridor, the alignment west of Ocean Street Extension, is located within the 100-year flood zone (i.e., 1% annual chance of flooding) for the San Lorenzo River. However, this utility corridor is limited to an underground storm drain line that discharges to the San Lorenzo River and does not include the

storage or use of hazardous materials or pollutant sources that could adversely affect receiving waters if inundated during a flood event. The project site is located at an elevation of over 300 feet amsl and outside of any tsunami hazard zones. In addition, there are no enclosed or semi-enclosed water bodies in the vicinity of the site such that there would be no likelihood of seiche waves affecting the project site. Therefore, considering the site characteristics, the impact of the Proposed Project related to the potential for release of pollutants due to project inundation associated with floods, tsunami or seiche waves would be less than significant.

4.10.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative hydrology and water 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, and where relevant to this topic. The geographic area of analysis for cumulative impacts related to hydrology and water quality in the San Lorenzo River watershed. Therefore, cumulative projects listed in Table 4.0-1 that are in the San Lorenzo River watershed are relevant to the cumulative analysis, as identified below.

The Proposed Project would not contribute to cumulative impacts related to groundwater (Significance Thresholds B and E) because of the characteristics of the underlying West Santa Cruz Terrace Groundwater Basin, the adherence of the Proposed Project to stormwater requirements allowing for groundwater infiltration, and the benefits of the Proposed Project for groundwater recharge, as described in Impact HYD-2. Therefore, these significance thresholds are not further evaluated.

Impact HYD-5	Cumulative Hydrology and Water Quality Impacts (Significance Thresholds A, C, D, and E). 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 surface water hydrology and water quality. ***(Less than Significant)***

As shown in Table 4.0-1 in Section 4.0, there are water capital investment projects, other infrastructure projects, and residential, commercial, or mixed-use projects identified within the study area.

Surface Water Quality and Stormwater Runoff

Within the San Lorenzo River watershed, the City Water Department Capital Investment Program includes replacement of the entire Newell Creek Pipeline (NCP), which runs from Loch Lomond Reservoir to the GHWTP. Another City project is the Santa Cruz Water Rights Project, which includes a number of water rights modifications along with infrastructure improvements that could be implemented as a result of the water rights modifications. The assessment of hydrological impacts due to surface water diversions provided in the Santa Cruz Water Rights EIR included operational conditions that would exist with the implementation of the NCP replacement and the proposed upgrades to the GHWTP being considered as part of the Proposed Project. These two projects were considered in the Santa Cruz Water Rights EIR analysis, as they are a component of the future conditions that would exist with the Santa Cruz Water Rights Project. The Santa Cruz Water Rights EIR concluded that the existing drainage patterns of the City's surface water sources would not be substantially altered due to surface water diversions resulting from the Santa Cruz Water Rights Project, and implementation of proposed upgrades to the GHWTP and the NCP replacement, such that potentially adverse water quality impacts would result, and the impact was determined to be less than significant (City of Santa Cruz 2021).

The only other known cumulative project that could affect drainage patterns in the San Lorenzo River due to long-term operations is the SLVWD's Conjunctive Use Plan for the San Lorenzo River Watershed (Conjunctive Use Plan). The Conjunctive Use Plan to increase stream baseflow for fish and increase reliability of surface and ground water supplies for the SLVWD would include water rights changes, use of existing interties to move water between service areas, and use of SLVWD's Loch Lomond Reservoir contractual rights for specified quantities of reservoir water. Environmental impacts of the Conjunctive Use Plan are not currently known, as SLVWD is in the process of preparing an EIR for the project (SLVWD 2023). It is possible that the EIR will find that the Conjunctive Use Plan will have significant effects on drainage patterns in the San Lorenzo River, including cumulatively considerable contributions to significant cumulative impacts. It is also possible that, as part of the EIR process, SLVWD will find ways to refine the Conjunctive Use Plan, or to formulate mitigation measures, that would avoid any such significant effects. Regardless, as the Proposed Project would not result in operational impacts, it would not have the potential to result in cumulatively considerable contributions to significant cumulative impacts, if such impacts are identified for the Conjunctive Use Plan or other cumulative projects. Therefore, the cumulative operational impact of the Proposed Project related to drainage patterns would be less than significant.

Potential soil erosion from all 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 discussed herein.

Cumulative project grading, construction, and operation for City facilities would be completed consistent with stormwater regulations established by the City of Santa Cruz and the County of Santa Cruz where facilities could be located in the coastal zone. As discussed in Section 4.10.2, Regulatory Framework, the City of Santa Cruz has developed a comprehensive SWMP to fulfill the requirements for the MS4 General Permit and to reduce the amount of pollutants discharged in urban runoff. In addition, the City Stormwater and Urban Runoff Pollution Control ordinance established the legal authority to require BMPs to be maintained in full force and effect throughout the life of a project. The City of Santa Cruz Municipal Code includes provisions to support 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. These provisions include requirements that a drainage plan be submitted for projects, both large and small, when existing drainage patterns would be altered by new construction. In addition, the ordinance requires that stormwater runoff resulting from project development be minimized, and if a proposed project includes the discharge of runoff into a natural watercourse, the drainage plan shall include methods to safeguard or enhance the existing water quality. Devices such as detention basins, percolation ponds, or sediment traps may be required by the City, where appropriate or as specified in an adopted plan. Provisions pertaining to erosion control include requirements that a site development be fitted to the topography and soil to create the least potential for erosion.

Other non-City cumulative projects would be required to comply with local stormwater regulations during cumulative project construction and operation related to stormwater quality, alteration of drainages, and increased runoff, as established in the local ordinances during cumulative project construction and operation. Therefore, the cumulative impacts of the Proposed Project, in combination with past, present, and reasonably

foreseeable future projects, related to surface water quality and stormwater runoff within the San Lorenzo River Watershed would be less than significant.

Flooding

The known cumulative projects planned within the geographic area of analysis for cumulative impacts related to flooding would be those City projects located within the San Lorenzo River watershed that are also located within a 100-year floodplain, including the following projects along the San Lorenzo River: Newell Creek Dam Inlet/Outlet Replacement Project, NCP Rehab/Replacement Project and improvements to the Felton Diversion and Tait Diversion and Coast Pump Station that would be implemented as part of the Santa Cruz Water Rights Project. The Newell Creek Dam Inlet/Outlet Replacement Project would replace the existing aging inlet/outlet works at the Newell Creek Dam and replace the northern segment of the NCP that transports water to/from the Reservoir and the GHWTP. As described above, the NCP Project would replace the remaining portion of the Newell Creek Pipeline to GHWTP. Fish passage improvements would be implemented at the Felton Diversion compliance with current fish passage and screening requirements. Proposed improvements at the Tait Diversion and Coast Pump Station would provide for compliance with current fish screening requirements and would allow for increasing the capacity of the pump station.

Although these cumulative projects identified above would be located within designated 100-year floodplains, construction and operation of these facilities would not increase the risk of downstream flooding, as no proposed structures would impede flooding and increase downstream flood flows. Additionally, any materials such as oil, grease, or degreasers that would continue to be used, stored, and disposed of during diversion operations would occur in accordance with all applicable state and local regulations and as a result, would not risk release of pollutants due to inundation.

Additionally, within the study area the residential, commercial, or mixed-use projects identified could alter drainage patterns and increase the rate or amount of surface runoff, which could exceed the capacity of stormwater drainage systems, resulting in flooding on- or off-site of these locations. However, as indicated above, the cumulative projects would be required to comply with local stormwater regulations during project construction and operation. Therefore, the cumulative impacts of the Proposed Project, in combination with past, present, and reasonably foreseeable future projects, related to flooding would be less than significant.

4.10.4 References

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4.11 Land Use and Planning

This section describes the existing land use 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on a review of the Proposed Project within the context of applicable plans, policies, and regulations.

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 land use and planning.

4.11.1 Existing Conditions

4.11.1.1 Project Site Land Use Conditions

The Proposed Project would primarily be constructed and located at the City of Santa Cruz's (City) existing GHWTP parcel, located within City limits; however, the parcel is non-contiguous to the City and hence constitutes an "island annexation". Additionally, the Proposed Project is anticipated to involve activities outside of the GHWTP for the purposes of temporary construction staging and potential utility and traffic safety improvements. These activities would occur in both City and County of Santa Cruz (County) jurisdictions, as shown in Chapter 3, Project Description, Figures 3-1 and 3-2. The Proposed Project is anticipated to be located at four sublocations of the primary project site and construction would be supported using two staging areas. Land uses on and around each location are described below, as identified in the County of Santa Cruz General Plan/Local Coastal Program (LCP) and on the County's GISWeb online tool General Plan and Zoning overlays (County of Santa Cruz 2020, 2023), as well as maps of general plan land use designations and zone districts for the City of Santa Cruz (City of Santa Cruz 2023a, 2023b). The location and size of the project site, including its sublocations, are described in Chapter 3, Project Description. Table 4.11-1 provides an overview of the locations, jurisdictions, and predominant land uses in and near the project site, including the primary project site and its four sublocations, and the two staging areas. General plan and zoning designations are provided where relevant.

Table 4.11-1. Overview of Predominant Land Uses at Project Site Locations

Proposed Facility	Location	Jurisdiction	Land Uses
Primary Project Site			
GHWTP Parcel	715 Graham Hill Road	City of Santa Cruz, "island annexation"	Existing GHWTP; zoning designation - Public Facility
Utility Corridor	Between the GHWTP parcel and the San Lorenzo River via Ocean Street Extension	County of Santa Cruz	Underground storm drain line; zoning designation – Commercial Agriculture
Graham Hill Road Right-of- Way	Graham Hill Road public right-of-way between Mosswood Court and Lyle Way	County of Santa Cruz	Public right-of-way; underground utility lines
Alternate Sanitary Sewer Lateral Replacement Area	Area from the GHWTP parcel (southwest corner) along Ocean Street Extension	County of Santa Cruz; City of Santa Cruz at southern end	Public right-of-way; Existing underground sewer line and other utility lines

Table 4.11-1. Overview of Predominant Land Uses at Project Site Locations

Proposed Facility	Location	Jurisdiction	Land Uses
Staging Areas			
Mt. Hermon Road Staging Area	Northern intersection of Graham Hill Road and Mt. Hermon Road	County of Santa Cruz	Outdoor storage and construction staging area; zoning designation - Residential Agriculture with Geologic Hazards Overlay Zone
Ocean Street Extension Staging Area	1941 Ocean Street Extension	City of Santa Cruz	Outdoor storage and construction staging area; zoning designation - Single Family Residential

Primary Project Site

The primary project site is comprised of approximately 17.1 acres, consisting of the areas listed above in Table 4.11-1. The majority of the primary project site consists of GHWTP parcel, which contains the City's only surface water treatment plant. The GHWTP parcel is zoned for Public Facility use under the City's Municipal Code. The GHWTP was originally constructed and commissioned into service in 1960. In the late 1960s the facility was expanded, and in the 1980s the mechanical, electrical and chemical equipment, and control systems were largely modernized. The GHWTP operates several treatment processes such as disinfection, taste and odor control, filtration, and corrosion control. Except for planned and unplanned outages, the GHWTP is in operation twenty-four hours a day, three hundred and sixty-five days a year and is always staffed. The GHWTP is a secured and fully fenced facility that is closed to the public. The GHWTP parcel is surrounded by residential uses.

The utility corridor is the location of the existing, dedicated storm drain line for the GHWTP and is zoned Commercial Agricultural under the County's Code. The Graham Hill right-of-way and the alternate sanitary sewer replacement area located along Ocean Street Extension are public roads with associated rights-of-way.

Staging Areas

The Mt. Hermon and Ocean Street Extension Staging Areas would be used during construction of the Proposed Project. These staging areas, which are approximately 5.1 acres and 1.9 acres respectively, are currently used for temporary staging and laydown of equipment and/or storage. However, the sites are zoned for residential uses under the City and County zoning regulations.

4.11.2 Regulatory Framework

4.11.2.1 Federal

There are no federal land use and planning-related regulations, plans, or policies that are applicable to the Proposed Project and/or project site.

4.11.2.2 State

California Government Code Section 53901

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 includes facilities dedicated to storage, treatment, and transmission of water; therefore, those facilities are exempted from City and County building and zoning ordinances. However, related facilities that serve functions other than those listed above, such as the Proposed Project's Operations and Filter Building located within City limits, remain subject to the City's zoning and building requirements.

4.11.2.3 Local

City of Santa Cruz

General Plan

The City's General Plan was adopted in 2012 (City of Santa Cruz 2012). The City's General Plan addresses state-mandated topics, as well as community design and economic development, in the following chapters: Historic Preservation, Arts, and Culture; Community Design; Land Use; Mobility; Economic Development; Civic and Community Facilities; Hazards, Safety, and Noise; Parks, Recreation, and Open Space; and Natural Resources and Conservation. The General Plan contains goals, policies, and actions that guide the planning, development, and preservation of the City through 2030. The Land Use Element of the General Plan includes a brief discussion of current land uses and provides the allowable uses within land use designations identified on the City's Land Use Map. General Plan policies that are applicable and relevant to the analysis of the Proposed Project in this section are included in Section 4.11.3.3, Project Impact Analysis (Table 4.11-2).

Municipal Code

The City's Municipal Code, Title 24, Zoning, sets forth the planning and zoning regulations for the City. The GHWTP parcel is located on land zoned Public Facility. Per Chapter 24.10, public utility facilities are identified as allowable uses with the Public Facility zoning classification with a special use permit, unless exempt by federal or state law. As indicated in Section 4.11.2.2, State, the project facility improvements would be exempt from these zoning regulations. As the Proposed Project does not include components that are located in the coastal zone, the City would not be required to obtain a Coastal Development Permit pursuant to Chapter 24.08.

Per Chapter 15.28, an encroachment permit would be required for the installation of the alternate sanitary sewer replacement in the segment of Ocean Street Extension located in the City. Section 4.13, Transportation, provides additional information about the requirements for encroachment permits from the City.

County of Santa Cruz

General Plan and Local Coastal Program

The County's 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 Land Use Element in the County General Plan and LCP provides for the designation and location of land uses and zoning uses throughout the unincorporated areas in the County. The County General Plan and LCP are part of the regulatory framework for the Proposed Project because portions of the primary project site and the Mt. Hermon Road staging area are located within the County's jurisdiction; however, because the Proposed Project is not located in the California Coastal Zone, it does require coastal development permits from the County and therefore is not covered by the LCP. An update to the County's General Plan, known as the Sustainability Policy and Regulatory Update or Sustainability Update, was approved by the County Board of Supervisors in December 2022 and is pending final certification by the California Coastal Commission. General Plan policies that are applicable and relevant to the analysis of the Proposed Project in this section are included in Section 4.11.3.3, Project Impact Analysis (Table 4.11-3).

Santa Cruz County Code

Planning and Zoning Regulations, Title 13 of the Santa Cruz County Code, set forth zoning regulations and identify allowable uses for the utility corridor and the Mt. Hermon staging area. These Proposed Project components are located in unincorporated Santa Cruz County; as shown in Table 4.11-1, these locations fall within the County's jurisdiction. The utility corridor, which is a part of the primary project site, is located on a parcel that is zoned Commercial Agriculture (CA) by the County. The intent of this zoning district is to preserve the commercial agricultural lands and maintain economic farm units comprising the commercial agricultural areas of the County. Public utilities, such as the existing storm drain line, are allowable uses in this zoning district; however, as indicated in Section 4.11.2.2, State, the Proposed Project facility improvements located in the County would be generally exempt from these zoning regulations.

The Mt. Hermon staging area is located on a parcel zoned Residential Agricultural (RA) with a Geologic Hazards (GH) combining district by the County. The intent of the RA zoning district is to provide areas of single-family residential use at non-urban densities in areas outside the urban services line and rural services line, where small-scale commercial agriculture can take place in conjunction with the primary use as residential. The GH combining district is applied to properties where geologic hazards exist. The property was previously authorized as a temporary laydown yard and staging area through a temporary use permit from the Santa Cruz County.

Per Chapter 9.70, an encroachment permit would be required for the alternate sanitary sewer replacement in the segment of Ocean Street Extension located in the County, for the storm drain line in the portion of the utility corridor where it crosses Ocean Street Extension, and potentially for traffic safety improvements within the Graham Hill right-of-way. Section 4.13, Transportation, provides additional information about the requirements for encroachment permits from Santa Cruz County.

4.11.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to land use and planning. 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 is also identified.

4.11.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to land use and planning are based on Appendix G of the CEQA Guidelines and the City of Santa Cruz CEQA Guidelines, as listed below. A significant impact would occur if the Proposed Project would:

A. Physically divide an established community.
B. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

4.11.3.2 Analytical Methods

This section evaluates the potential land use and planning impacts associated with construction and operation of the Proposed Project. The methodology applied to assess and evaluate impacts related to land use and planning is based on information obtained from review of existing and proposed land uses and development on the primary project site and staging areas, review of existing surrounding land uses and development, review of the Proposed Project's potential for conflicts with applicable General Plan policies. 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 regulations, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. However, there are no City standard construction practices specifically applicable to land use and planning that are part of the Proposed Project. Standard construction practices related to other technical topics are considered throughout Chapter 4, Environmental Setting, Impacts and Mitigation Measures, and may be referenced in the impact analysis below related to potential conflicts with policies.

4.11.3.3 Project Impact Analysis

Areas of No Impact

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

- **Physically Divide an Established Community (Significance Threshold A).** The Proposed Project would replace the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities. The upgrade increases the reliability of the GHWTP to meet current and anticipated future water quality requirements, improves the ability to treat variable and degraded source water quality conditions, and modernizes GHWTP to meet contemporary building, electrical, and fire code requirements. Upgrades and modifications to the GHWTP, and its supporting infrastructure, would continue the existing land uses on the project site and would not result in physical division of an established community. While the Proposed Project may require improvements along the utility corridor, Graham Hill right-of-way, and alternate sanitary sewer replacement area, they would not introduce permanent barriers or linear features that could physically divide an established community, as replacement piping would be installed underground, and the overlying areas would be restored after construction. The Proposed Project would not introduce a new linear element within the project area, such as a freeway or other type of barrier that could

divide an existing community. New perimeter and interior fencing replace existing fencing and would surround the existing GHWTP and pretreatment processes that are internal to the site. Therefore, the Proposed Project would have no impact related to physically dividing an established community and this threshold is not further evaluated.

Project Impacts

Impact LU-1	Conflicts with Land Use Plans, Policies, or Regulations (Significance Threshold B). Construction and operation of the Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. ***(Less than Significant)***

This discussion focuses on land use plans, policies, and regulations relevant to the Proposed Project that relate to avoiding or mitigating environmental effects, and whether any potential conflicts could create a significant physical impact on the environment.

As indicated in Section 4.11-1, Existing Conditions, the GHWTP parcel is located within City limits and the proposed upgrades to the GHWTP would be implemented in this location. The remainder of the primary project site (i.e., the Graham Hill Road right-of-way, the utility corridor, and the alternate sanitary sewer lateral replacement area) are located primarily in the County, except for the southern end of the alternate sanitary sewer lateral replacement area that is located in the City. While the majority of the Proposed Project is exempt from zoning regulations, under California Government Code Section 53091 (d) and (e) facilities for the treatment of water supplies, certain related facilities which serve functions other than what is exempted remain subject to the City's zoning requirements (i.e., the upgraded Operations and Filter Building). The upgrades to the GHWTP are consistent with the existing use of the site as a water treatment plant and with the Public Facility zoning designation under the City's Municipal Code. Additionally, potential replacement or rehabilitation of the existing storm drain line in the utility corridor would be an allowable use in the Commercial Agricultural zoning designation under the County's Code. The Graham Hill right-of-way and the alternate sanitary sewer replacement area located along Ocean Street Extension are public roads with associated rights-of-way and any work in these areas would require encroachment permits from the County or City, depending on the location, as indicated in Section 4.11.2, Local.

Applicable general plan polices are reviewed herein to determine whether any potential conflicts with these policies could create a significant physical impact on the environment. The focus of this analysis is on City General Plan policies, given that the proposed upgrades to the GHWTP would be located in the City; however, relevant County General Plan policies are also included where relevant to Proposed Project components located in the County. As summarized in Table 4.11-2, the Proposed Project would not conflict with applicable policies of the City General Plan. As summarized in Table 4.11-3, the Proposed Project would not conflict with applicable policies of the County General Plan. Therefore, the impact of the Proposed Project related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant impact.

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
HA1.2 Protect (or where not possible, responsibly manage) sensitive archaeological and paleontological resources as early in the land-use planning and development process as possible	**No Conflict.** As discussed in Sections 4.5, records searches and field surveys conducted for the Proposed Project did not identify any known archaeological or paleontological resources on the project site (Appendix E). While there is low potential for encountering unknown archaeological resources during construction, there is still a potential for discovering previously unknown, subsurface archaeological deposits and/or human remains during earth disturbing construction activities. The City's standard construction practices #15, #16, and #20 regarding inadvertent discovery of archaeological deposits and human remains identifies measures to be taken to assess a discovery and implement measures, if needed, to avoid or reduce impacts, and requires sensitivity training for construction workers. As discussed in Section 4.7, Geology and Soils, substantial ground-disturbing activities associated with construction of the Proposed Project below the depth of artificial fill at the GHWTP parcel and along the alternate sanitary sewer lateral replacement area have the potential to result in disturbance to paleontological resources. With the implement of MM GEO-1, which involves the implementation of a paleontological resources impact mitigation program, paleontological monitoring, and procedures for potential discovery of paleontological resources, potential impacts would be reduced to less than significant.
HA1.2.2 Require preparation of archaeological investigations on sites proposed for development within areas identified as "Highly Sensitive" or "Sensitive" on the "Areas of Historical Archaeological Sensitivity" map, except for exempt uses within "Sensitive" areas	**No Conflict.** The project is not located within areas identified as "Highly Sensitive" or "Sensitive" on the "Areas of Historical Archaeological Sensitivity" map generated for the General Plan EIR. Nonetheless, a Cultural Resources Inventory and Evaluation Report (CRIER) was conducted for the Proposed Project that included an archaeological investigation of the site, involving records searches and a field survey (Appendix E).
HA1.3 Seek and consider input of descendent community and historical organizations on the protection of archeological resources.	**No Conflict.** As described in Section 4.5, Cultural Resources and Tribal Cultural Resources, a Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search was conducted for the project study area. As a result of this search, the NAHC provided a list of seven Native American contacts that might have local knowledge of cultural and tribal cultural resources for the project area. Thereafter, the City sought input from these tribal contacts as identified in the CRIER (Appendix E). Additionally, local historical organizations were also contacted, as identified in the CRIER.
HA1.3.1 Formalize meetings with descendent communities and historical organizations to gather input on the protection of cultural and historic resources.	**No Conflict.** As described in Section 4.5, Cultural Resources and Tribal Cultural Resources, and under HA1.3, the City communicated with seven tribal contacts; these communications were kept in a communication log, which is saved in a confidential appendix to the project's CRIER (Appendix E).

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
HA1.4 Manage the discovery of human remains and the protection of archaeological deposits in accordance with local, State, and federal requirements.	**No Conflict.** As described under HA1.2, the City's standard construction practices #15, #16, and #20 regarding inadvertent discovery of archaeological deposits and human remains identifies measures to be taken to assess a discovery and implement measures, if needed, to avoid or reduce impacts. As indicated in standard construction practice #16, the practice would adhere to the legal requirements related to the discovery of human remains contained in Section 7050.5 of the California Health and Safety Code Section 5097.98 of the California Public Resources Code (see Section 4.5.3.2, State, for details).
HA1.5 Require that archaeological work within the city be performed by a qualified archaeologist.	**No Conflict.** Archaeological work, including the field survey and records search contained in the CRIER (Appendix E), was conducted by qualified archaeologist, as documented in the report.
CD1.2 Ensure that the scale, bulk, and setbacks of new development preserve important public scenic views and vistas.	**No Conflict.** As discussed in Section 4.2, Aesthetics, prominent scenic views in the City and on the UC Santa Cruz campus are mapped on General Plan EIR 2030 Figure 4.3-1, Significant Views/Features. None of the mapped panoramic views depicted on Figure 4.3-1 (including views from Pogonip Open Space) are oriented towards the GHWTP and the nearest mapped urban view does not extend to the GHWTP or GHWTP facilities due to intervening tall trees and higher terrain. As such, the Proposed Project would not eliminate or substantially adversely affect, scenic views or vistas designated by the City's General Plan. While not a City-designated scenic vista or panoramic view, the Lookout Trail Trailhead parking lot off Coolidge Drive along the western boundary of Pogonip offers scenic views of the surrounding area. While the existing GHWTP and Proposed Project would be visible from the trailhead lookout, proposed development would not entail the alteration of forested lands or other modifications that would noticeably affect or modify the quality of the existing view. Further, new and upgraded water treatment processes, new and upgraded buildings, and infrastructure and site improvements on the GHWTP site would not create any view obstructions such as blockage of the distant Santa Cruz Mountains. As discussed in further detail in Section 4.2, Aesthetics, the Proposed Project would not eliminate or substantially adversely affect the eastward view available from the Lookout Trail Trailhead parking lot.
CD1.3 Ensure that development is designed to be in harmony with natural topography and vegetation.	**No Conflict.** The GHWTP parcel features varying topography (elevations generally increase from west to east and south to north). The Proposed Project development on the GHWTP parcel would continue to focus development on the existing upper and lower building pads on the site to minimize the need for substantial grading and tree removal, where possible. Vegetation in the undeveloped portions of the GHWTP parcel along the northern and western portions of the property boundary would be retained. The Proposed Project would include screening and landscaping improvements using locally native, fire resistant, and drought-tolerant species around the upgraded Operations and Filter Building, and in areas where screening would be important.

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
CD1.4 Ensure that development adjacent to open space lands maintains visual and physical connections to that open space.	No Conflict. While the GHWTP site is within the vicinity of the Pogonip, it is not directly adjacent to open space lands. Therefore, the Proposed Project would not disrupt physical connections to open space lands. Furthermore, as discussed in Section 4.2, Aesthetics, and for Policy CD1.3, the GHWTP site is surrounded by intervening terrain and/or tall mature trees that provide a visual buffer from the Pogonip.
CD4.2 Ensure that new development and right-of-way improvements enhance the visual quality of streetscapes.	No Conflict. The Proposed Project may involve traffic calming measures along a segment of the Graham Hill Road right-of-way. Traffic calming measures could include installing warning signs on both approaches to the Graham Hill Road and Entrance Roadway Intersection, to warn approaching drivers of the presence of the GHWTP driveway; and markings/striping of transverse strips or optical bars to encourage drivers to reduce speed. These types of improvements are common along roadways in Santa Cruz County and would not degrade the visual quality along Graham Hill Road. All other Proposed Project improvements in public rights-of-way would be underground and would not degrade visual quality.
CD4.3.2 Maintain high quality landscaping on City-owned lands, parking lots, and parks.	No Conflict. The GHWTP site would be landscaped under the Proposed Project with locally native, fire resistant, and drought-tolerant species (as appropriate). Specifically, these improvements would be located around the upgraded Operations and Filter Building and in areas where screening and erosion control would be important. New landscaping would meet the City requirements related to fire resistance and water efficiency.
M3.2.4 Improve traffic safety and flow. Ways to do this include installing and maintaining traffic signs, pavement markings, and median improvements.	No Conflict. The Proposed Project includes vehicular access improvements that would allow internal truck traffic circulation and provide for secure vehicle access gates and internal signage. As described in Section 4.13, Transportation, given the low driveway vehicle volumes at Graham Hill Road and Entrance Roadway Intersection, the signal warrant is not met under both existing conditions and future 2040 conditions with the Proposed Project and therefore no traffic signal is warranted. However, the Proposed Project may include traffic calming measures on Graham Hill Road, as described for Policy CD4.2.
CC2.1 Provide community services and facilities in keeping with the needs of a growing and diverse population.	No Conflict. The City is tasked with the public health function of providing the community with a clean, safe, and reliable supply of drinking water. As described in Chapter 3.0, the underlying purpose of the Proposed Project is to provide for a modernized treatment plant that: meets contemporary building, electrical, and fire code requirements; supports the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and Securing Our Water Future Policy (SOWF) Policy; increases the City's treatment reliability to meet current and anticipated future water quality requirements; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire and severe storms. For these reasons, the Proposed Project would provide the community a water treatment facility that would meet the needs of the population.

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
CC3.2 Meet or exceed all regulatory drinking water standards.	No Conflict. See description under Policy CC2.1. Under the Proposed Project, the GHWTP would continue to operate under a State Water Resources Control Board Division of Drinking Water domestic water supply permit and will continue to comply with all applicable drinking water regulations. All water supplied by the City for domestic purposes would continue to meet all State and Federal criteria for public health protection.
CC3.4.2 Modernize City water treatment plants.	No Conflict. The Proposed Project would modernize the GHWTP, as described under Policy CC2.1.
CC3.4.4 Evaluate and improve the water system so as to minimize water outages due to emergencies and disasters.	No Conflict. As described under Policy CC2.1, the Proposed Project would modernize the GHWTP which would aid in the minimization of water outages due to emergencies and natural disasters. Furthermore, an objective of the Proposed Project, as stated in Chapter 3.0, is to optimize the treatment facility, such that the treatment facilities can readily recover from and/or adjust to changing water quality or other potential disruptive events.
CC5.1.8 Require new development to maintain predevelopment runoff levels.	No Conflict. As described in Section 4.10, Hydrology and Water Quality, the Proposed Project would be subject to the City's Tier 4 Mandatory Requirements in the City's Storm Water BMP Manual that reflects municipal separate storm sewer system (MS4) Phase II stormwater regulations. Under these requirements, the pre-developed runoff flowrate of a 10-year/24-hour rain event would not be exceeded. For the Proposed Project, the presence of steeply sloped areas, buildings, paved roadways, paved parking areas, existing facilities, impermeable soils, and subsurface process-related utilities and tanks, limits the areas available and/or suitable for construction of Low Impact Development Best Management Practices (LID BMPs). On-site infiltration testing found that infiltration on site is limited. The planned stormwater control measures (SCMs) are capable of meeting Tier 1, 2 and 4 requirements; full compliance with Tier 3 is technically infeasible. Therefore, as allowed by the Storm Water BMP Manual, alternative compliance is proposed by providing 10% of the Proposed Project's Equivalent Impervious Surface Area dedicated to retention-based SCMs consistent with City requirements.
CC5.1.9 Reduce stormwater pollution.	No Conflict. As described in Section 4.10, Hydrology and Water Quality, the Proposed Project would reduce stormwater pollution during construction and operation. With implementation of the City's standard construction practices, the Construction General Permit and required stormwater pollution prevention plan, and applicable MS4 requirements pertaining to construction erosion control and hazardous materials management, stormwater pollution during Proposed Project construction would be controlled. With implementation of the required LID BMPs and SCMs consistent with the City's stormwater requirements and Basin Plan objectives, along with continued conformance with current drinking water regulations for public agencies and NPDES discharge requirements, stormwater pollution during Proposed Project operations would also be controlled.

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
CC5.1.10 Implement a water pollution prevention program	**No Conflict.** See description under Policy CC5.1.9.
HZ1.1.6 Ensure preparation for delivery of a safe, reliable water supply in an emergency	**No Conflict.** As described under Policy CC2.1 and CC3.4.4, the Proposed Project would modernize the GHWTP and aid in the delivery of a safe, reliable water supply in an emergency.
HZ1.1.9 Ensure that water, gas, and sewage utilities serving critical facilities are in good condition and are engineered to withstand damage from disasters.	**No Conflict.** As described under Policy CC2.1 and CC3.4.4, the Proposed Project would modernize the GHWTP. Furthermore, an objective of the Proposed Project is to provide a water treatment facility that meets current seismic, building, fire, and electrical codes. Therefore, the Proposed Project would upgrade the exiting GHWTP so that it could further withstand damage from disasters.
HZ1.5.4 Require new development in areas susceptible to wildfires to be responsible for fire prevention activities (e.g., visible house numbering and use of fire resistant and fire-retardant building and landscape materials) and to also provide a defensible zone to inhibit the spread of wildfires.	**No Conflict.** As discussed in Section 4.15, Wildfire, the Proposed Project would implement standard construction practices that include fire safety measures for operating equipment 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) unless adequate fire protection measures are implemented in compliance with federal, state, and local fire prevention and protection regulations and guidance. The Proposed Project would also include internal roadway and related vehicular access improvements that would be built in accordance with the 2022 California Building Fire Codes. Construction of these improvements would increase the noncombustible area on the project site, which would further reduce the amount of available fuels on site and increase the amount of defensible space.
HZ1.5.5 Maintain all access roads and driveways so as to ensure the fire department safe and expedient passage at all times.	**No Conflict.** As described under Policy HZ1.5.4, the Proposed Project involves the construction of vehicular access improvements. As detailed in Chapter 3.0, these include internal vehicular access improvements within the GHWTP site to allow for truck traffic circulation for chemical delivery trucks, fire trucks, and dewatered solids removal within the GHWTP site. A total of approximately 75 parking spaces would be included. This proposed parking provides a net increase of 23 parking spaces over the existing 52 parking spaces at the GHWTP. An increase in the number of parking spots would improve internal circulation, and provide safe, delineated areas for vehicles. These improvements would reduce fire risk as they would provide additional area for emergency personnel in the case of a fire.
HZ3.1.1 Require land uses to operate at noise levels that do not significantly increase surrounding ambient noise.	**No Conflict.** As described in Section 4.12, Noise and Vibration, with the implementation of MM NOI-1, the Proposed Project would not generate a substantial permanent increase in noise levels due to new stationary/operational noise sources and the impact would be reduced to less than significant.

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
HZ3.1.2 Use site planning and design approaches to minimize noise impacts from new development on surrounding land uses.	**No Conflict.** See description under Policy HZ3.1.1.
HZ3.1.3 Ensure that construction activities are managed to minimize overall noise impacts on surrounding land uses.	**No Conflict.** As described in Section 4.12, Noise and Vibration, with the implementation of MM NOI-2, requiring a range of construction-phase measures to reduce construction noise, the Proposed Project would minimize overall noise impacts on surrounding land uses, consistent with this general policy. However, it may not be possible to be consistent with the construction noise thresholds under all circumstances at the GHWTP parcel from 5:00 PM to 8:00 AM when the thresholds apply and therefore the construction noise impact of the Propose Project would be significant and unavoidable, as acknowledged in Impact NOI-2.
HZ3.1.6 Require evaluation of noise mitigation measures for projects that would substantially increase noise.	**No Conflict.** As described under Policies HZ3.1.1, HZ3.1.2, and HZ3.1.3, the Proposed Project would implement MM NOI-1 and MM NOI-2. Therefore, the Proposed Project has evaluated and would implement noise mitigation measures to address increased noise levels during construction and operation.
HZ4.4 Reduce the risk of exposure to hazardous materials from sites being developed or redeveloped.	**No Conflict.** The Proposed Project would be subject to all appliable federal, state and local regulations to address the risk of exposure of hazardous materials, as described in Section 4.9, Hazards and Hazardous Materials. Additionally, MM HAZ-1 and MM HAZ-2 would be implemented to provide for the proper disposal of arsenic-impacted soils and asbestos from demolished building materials.
HZ4.4.1 Regulate the siting and permitting of businesses that handle hazardous materials, and assure that safe handling and use information from those businesses is provided to fire protection and other safety agencies.	**No Conflict.** See description under Policy HZ4.4. Additionally, the Proposed Project would be required to prepare an amendment to the existing Hazardous Material Business Plan for the GHWTP, as described in Section 4.9, Hazards and Hazardous Materials.
HZ5.1.3 Consider appropriateness of lighting when reviewing proposed development or renovation of parks and recreation facilities	**No Conflict.** As described in detail in Section 4.2, Aesthetics, Proposed Project lighting at the GHWTP may include roadway lights, wall mounted lights at the exterior of buildings, and maintenance lights located at outdoor open process areas. All lighting fixtures would be LED type, and designed and selected to meet exterior lighting allowances established in the California Building Code for the applicable LZ1 zone (low ambient lighting; typically, rural areas). Potential off-site light trespass would be minimized by focusing the installation of lighting in similar locations as under existing conditions and using hooded and downward directed luminaires. All installed lighting would be useful (i.e., all lighting would have a clear purpose), targeted and directed only where needed, and would feature the lowest light level required to provide safety. In addition, on-site lighting sources would be selected and installed to avoid casting of light outside of the GHWTP property line.
HZ6.3 Reduce the potential for life loss, injury, and property and economic damage from earthquakes,	**No Conflict.** As described in Section 4.7, Geology and Soils, the Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death

Table 4.11-2. Review of Applicable City General Plan Policies

Policy/Ordinance	Potential for Proposed Project to Conflict
liquefaction, and other seismic hazards.	resulting from seismic ground shaking or seismic-related ground failure, including liquefaction. The GHWTP and proposed infrastructure improvements would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Areas susceptible to liquefaction, lateral spreading, and differential compaction would be engineered to minimize seismic related impacts. 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.
HZ6.3.4 When feasible, upgrade sewer, water, and other piping to withstand seismic shaking and differential settlement.	**No Conflict.** As described under Policy CC2.1, the Proposed Project would modernize the GHWTP and involve sewer improvements and other piping to support the facility's new systems. As described in Section 4.7, Geology and Soils, and above for Policy HZ6.3, these modernizations and upgrades would be designed to withstand seismic shaking and differential settlement.
NRC2.1.3 Evaluate development for impacts to special-status plant and animal species.	**No Conflict.** The EIR evaluates impacts to special-status plant and animal species in Section 4.4, Biological Resources. According to this analysis, the Proposed Project would have no impact on special-status plants but could impact some special-status wildlife species during construction. However, as described in Section 4.4, MM BIO-1 through MM BIO-4 would reduce potentially significant impacts related to special-status wildlife species to less than significant. MM BIO-1 requires survey and monitoring for special-status amphibian and reptile species; MM BIO-2 requires biological monitoring for the project site and staging areas; MM BIO-3 requires species relocation in the event that special-status species are observed within the construction area; and MM BIO-4 requires pre-construction surveys for San Francisco dusky-footed woodrat.
NRC2.1.4 Implement strategies to reduce or minimize impacts (to plant and animal communities and habitats).	**No Conflict.** As described for Policy NRC2.1.3, the Proposed Project would implement mitigation measures to reduce or minimize impacts to wildlife species. Furthermore, the Proposed Project would also implement MM BIO-5 which requires an aquatic resource delineation that would be used to calculate temporary and permanent impacts for reporting in permitting applications and to determine the appropriate amount of compensatory mitigation for unavoidable impacts.
NRC2.2.1 As part of the CEQA review process for development projects, evaluate and mitigate potential impacts to sensitive habitat (including special-status species) for sites located within or adjacent to these areas.	**No Conflict.** See description under Policies NRC2.1.3 and NRC2.1.4.

Table 4.11-3. Review of Applicable County General Plan Policies

Policy/Objective	Potential for Proposed Project to Conflict
BE-1.1.4 (LCP) Siting New Development – Require new urban residential, commercial, or industrial development to locate within, next to, or near existing developed areas with adequate public services and where development will not have significant adverse effects on agricultural land or natural resources.	**No Conflict.** The Proposed Project is sited in existing developed areas with access to public services. As discussed in Section 4.1, Impacts Not Found to be Significant, the Proposed Project and would not have an adverse environmental effect on agricultural land. The Proposed Project's impacts on other natural resources, such as biological resources, geology and soils, and hydrology and water quality, are analyzed throughout this EIR. Analysis of those topics determined that the Proposed Project would not result in significant unavoidable environmental impacts.
BE-1.5.5 (EJ [Environmental Justice]) Public Facility and Service Extensions – Coordinate public service planning with cities, special districts, and LAFCO to ensure sufficient and efficient service delivery to all communities. Program the timing and location of public service capacity expansions or extensions to support projected levels of development and to maintain economic, social, and environmental quality.	**No Conflict.** As described in Chapter 3, Project Description, the Proposed Project would require a Sewer Connection Permit & Waste Discharge Permit from Santa Cruz County if the Proposed Project connects to the County sewer main in Graham Hill Road. Additionally, a Local Agency Formation Commission (LAFCO) Extraterritorial Service Authorization may also be required if the Proposed Project connects to this County sewer main. The City is coordinating with the County related to this potential connection and, if pursued, would also coordinate with LAFCO.
BE-4.2.2 (LCP) Site Design for Environmental Protection – Review new developments for compliance with SCCC [Santa Cruz County Code] Title 16 environmental ordinances. Siting and designs should minimize grading, avoid or provide mitigation for geologic hazards and sensitive habitats, reduce fire risk, conform to the physical constraints and topography of the site, and maintain natural drainage patterns. Streams should remain daylighted rather than piped, where possible, with development incentives or variances allowed to ensure feasibility and property owner support for open streams. Development on slopes should be low profile and step down the hillside. Unnecessary grading for the purpose of meeting building height restrictions is prohibited.	**No Conflict.** The Proposed Project was would not result in significant and unavoidable impacts related to geologic hazards, sensitive habitats, fire risks, and drainage patterns. As described in Section 4.7, Geology and Soils, 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 geologic hazards. The Proposed Project would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Also as described in Section 4.4, Biological Resources, the Proposed Project would have a less than significant impact on riparian habitat and other sensitive natural communities. Furthermore, as discussed in Section 4.10, Hydrology and Water Quality, the Proposed Project would also be subject to Chapter 18.45, Excavation and Grading Regulations, of the City of Santa Cruz's Municipal Code that includes grading requirements such as erosion control (18.45.110), drainage and terracing (18.45.100), and winter (rainy season) grading requirements (18.45.040). All of these grading requirements would ensure that BMPs are incorporated in all phases of construction work. The Proposed Project would also be required to implement drainage control requirements would reduce post-development runoff to be no more than pre-development conditions. As a result, the impact of the Proposed Project related to alteration of drainage patterns would be less than significant.

Table 4.11-3. Review of Applicable County General Plan Policies

Policy/Objective	Potential for Proposed Project to Conflict
BE-4.2.4 (LCP) Wildlife-Compatible Development – Limit reflectivity, glare, and artificial light pollution from buildings and sites as practicable in order to preserve dark skies and reduce impacts to wildlife, especially in rural areas and over marine waters. Encourage landscapes that provide habitat for birds and wildlife as appropriate based on the location and intensity of development. Encourage the use of native plants and discourage the use of invasive species.	**No Conflict.** As described in Section 4.2, Aesthetics, the Proposed Project components, including new sources of lighting, new structures, and new materials, would not result in a significant impact related to light or glare. While the Proposed Project involves tree removal, the loss of heritage trees would be addressed through compliance with Chapter 9.56 of the City Municipal Code (Heritage Tree Ordinance) that requires replanting of tree species or payment of in-lieu fees. As the Proposed Project would not substantially increase light levels, or add new lighting that would penetrate adjacent habitat, potential operational impacts related to night lighting on wildlife would be less than significant, as described in Section 4.4, Biological Resources. Additionally, as described in Chapter 3, Project Description, landscaping improvements would use locally native, fire resistant, and drought-tolerant species.
BE-4.2.5 (LCP) Stormwater Runoff Reduction – Encourage the use of design elements such as permeable pavers and bioswales, in order to minimize impervious area and to reduce and pretreat stormwater flowing off site into the public storm drain system, and to improve the quality of stormwater infiltrating into the groundwater supply both on- and off-site.	**No Conflict.** As described in Section 4.10, Hydrology and Water Quality, the Proposed Project would include construction of new structures and facilities on the site and would alter existing drainage patterns. New impervious surface would be managed with stormwater control features consistent with City requirements, which are designed to minimize the potential for erosion and siltation. These would provide the required detention volumes to allow for increases in stormwater runoff to be managed. Implementation of these drainage control requirements would reduce post-development runoff to be no more than pre-development conditions. As a result, the impact of the Proposed Project related to alteration of drainage patterns would be less than significant.
BE-4.2.7 (EJ) Energy Conservation – Development should enable passive solar heating and lighting through building location, orientation and massing wherever practicable. Passive solar should be a priority for energy conservation in building design. Further energy conservation should be achieved with energy-efficient building envelopes, lighting, heating, cooling, and ventilation systems, and renewable energy design components.	**No Conflict.** The Proposed Project would comply with all applicable Title 24 code provisions, such as the solar ready building mandatory requirements, where applicable. As the Proposed Project design progresses, consideration will be given to maximize solar access for the roofs. While the Proposed Project does not propose battery storage or hydroelectric generators at the time, the Proposed Project does not preclude installation of these technologies in the future if determined to be a feasible and compatible land use of the site.
BE-4.2.9 (EJ) Construction Material Conservation – Reduce the volume of construction waste going to landfills through promoting retention and re-use of existing structures, efficient design and construction techniques, use of recycled-content materials, and structure deconstruction instead of demolition.	**No Conflict.** The Proposed Project reuses existing structures to the extent possible. As described in Section 4.14, Utilities and Service Systems, the California Green Building Standards Code requires all newly constructed buildings and demolitions to develop a Construction Waste Management Plan (CWMP) and divert a minimum of 65% non-hazardous construction debris. Senate Bill 1374 and the California Code of Regulations Title 24 require developers to help divert waste from landfills and comply with statewide mandates. With compliance with the Green

Table 4.11-3. Review of Applicable County General Plan Policies

Policy/Objective	Potential for Proposed Project to Conflict
	Building Standards Code, and City requirements, the construction impacts of the Proposed Project related to solid waste would be less than significant.
AM-1.1.1 Vehicle Miles Traveled Impacts – Maintain a VMT threshold that best supports statewide and regional greenhouse gas reduction goals as determined by the best available data and modeling practices.	**No Conflict.** As described in Section 4.13, Transportation, the Proposed Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause an increase in vehicle miles traveled (VMT) that is greater than 15% below the regional average VMT.
AM-2.2.4 Maintenance Safety – Require that contractors and utility companies doing roadside work maintain the road edge in the best possible condition during construction and, upon project completion, improve the road shoulder to the pre-construction condition or better in order to minimize safety issues due to damaged roadways and sidewalks to bicyclists and pedestrians.	**No Conflict.** The Proposed Project involves infrastructure and site improvements along existing roadways. However, as described in Section 4.13, Transportation, implementation of the Proposed Project would require encroachment permits from the City or County, depending on the location. Such permits would require that work in the public right-of-way include restoration of disturbed areas to pre-construction conditions.
AM-5.2.3 Limiting Traffic Volumes – Seek to limit traffic volumes and speeds in residential neighborhoods through traffic calming measures without reducing connectivity to adjacent neighborhoods and commercial areas.	**No Conflict.** As described in Chapter 3, Project Description, traffic calming measures may be installed on Graham Hill Road and could include installing warning signs on both approaches to the Graham Hill Road and Entrance Roadway Intersection, to warn approaching drivers of the presence of the GHWTP driveway; and markings/striping of transverse strips or optical bars to encourage drivers to reduce speed.
AM-6.1.1 Fire and Emergency Response Access – Design adequate roadway infrastructure for fire and emergency response safety including safe access by emergency response vehicles, visible street signs, and water supplies for structural fire suppression.	**No Conflict.** As described in Section 4.13, Transportation, given the implementation of traffic control plans during construction, and given that the Proposed Project would not result in permanent changes to area roadways, the Proposed Project would not result in inadequate emergency access, or substantially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
AM-6.2.1 Level of Service Criteria – Require development projects to provide multimodal roadway improvements necessary to achieve a minimum level of service (LOS) of "D," except for those where a lesser LOS has been accepted by the County pursuant to the criteria specifically identified in Table 3-2 below. When development is proposed on roads where a LOS E or F standard has been accepted, require feasible mitigation in the form of road improvements, a fair share contribution to a road improvement program, or other in-lieu mitigation for the transportation system.	**No Conflict.** Within Section 4.13, Transportation, temporary construction trips occurring over the peak construction period are summarized on Table 4.13-2. As noted in this section, these trips would not create a measurable impact to any roadway or intersection in the area and would not conflict with the County's LOS policies.
ARC-1.3.1 (LCP) Conversion of Commercial Agricultural Lands – Consider conversion and/or development of commercial agricultural lands to non-agricultural uses only under the following circumstances: (1) It is determined that the land	**No Conflict.** The utility corridor, which is a part of the primary project site, is located on a parcel that is zoned Commercial Agriculture (CA) by the County. The intent of this zoning district is to preserve the commercial agricultural lands and maintain economic farm units

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is not viable for farming or for other allowable agriculture uses, and that it is not likely to become viable in the near future (see policy 5.13.21 ARC-1.3.2); (2) Findings are made that new information has been presented to demonstrate that the conditions on the land in question do not meet the criteria for commercial agricultural land; and (3) The conversion of such land or use for non-agricultural uses will not impair the viability of, or create potential conflicts with, other commercial agricultural lands in the area.	composing the commercial agricultural areas of the County. Public utilities, such as the existing storm drain line, are allowable uses in this zoning district. As indicated in Section, 4.1, Impacts Not Found to be Significant, the utility corridor is located on parcels mapped as Other Land by the California Department of Conservation (California Department of Conservation 2018). Common examples of Other Land include low density rural developments and riparian areas not suitable for livestock grazing. Therefore, the potential replacement or rehabilitation of the storm drain line in the utility corridor would not result in the conversion of commercial agricultural lands to non-agricultural uses.
ARC-3.1.6 (LCP) Development Within Sensitive Habitats – Sensitive habitats[1] shall be protected against any significant disruption of habitat values, and any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. Reduce in scale, redesign, or, if no other alternative exists, deny any project that cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of a project is legally necessary to allow a reasonable use of the land.	**No Conflict.** As described in Section 4.4, Biological Resources, impacts of the Proposed Project related to special-status species and protected wetlands or waters would be reduced to less than significant with identified mitigation measures (MM BIO-1, MM BIO-2, MM BIO-3, MM BIO-4, and MM BIO-5). The Proposed Project would have a less than significant impact on riparian habitat and other sensitive natural communities with the implementation of the City's standard construction practices implemented as part of the Proposed Project.
ARC-3.1.10 (LCP) Species Protection – Recognize that habitat protection is only one aspect of maintaining biodiversity and that certain wildlife species, such as migratory birds, may not utilize specific habitats. Require protection of these individual rare, endangered, and threatened species and continue to update policies as new information becomes available.	**No Conflict.** See description under Policy ARC-3.1.6, above.
ARC-3.1.12 (LCP) Steelhead and Coho Salmon Conservation Strategy – Implement the policies and programs identified in the 2013 Steelhead and Coho Salmon Conservation Strategy and updates to this strategy to support the recovery of steelhead and coho salmon in Santa Cruz County. Priority actions include addressing streamflow,	**No Conflict.** As described in Section 4.4, Biological Resources, Central California coast steelhead is known to occur in the San Lorenzo River at the western edge of the primary project site (utility corridor) and Ocean Steet Extension staging area. Potential replacement or rehabilitation of the existing storm drain line in the utility corridor is not expected to have a substantial adverse effect on this species given the limited amount of habitat

[1] Policy ARC-3.1.2, Definition of Sensitive Habitats, includes areas of special biological significance as identified by the State Water Resources Control Board; coastal scrub, maritime chaparral, native rhododendrons and associated Elkgrass, mapped grasslands in the coastal zone and sand parkland; and Special Forests including San Andreas Live Oak Woodlands, Valley Oak, Santa Cruz Cypress, indigenous Ponderosa Pine, indigenous Monterey Pine and ancient forests; areas adjacent to essential habitats of rare, endangered or threatened species; areas that provide habitat for Species of Special Concern as listed by the California Department of Fish and Wildlife Game in the Special Animals list, California Natural Diversity Database; areas that provide habitat for rare, endangered or threatened species as designated by the California State Fish and Game Commission, United States Fish and Wildlife Service or California Native Plant Society or that meet the definition of CEQA Guidelines Section 15380; coastal habitats; all lakes, wetlands, estuaries, lagoons, streams and rivers; and riparian corridors.

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habitat complexity, sediment reduction, and migration passage.	that would be affected and given the implementation of City standard construction practices as part of the Proposed Project. Additional measures for protection of this species may be required as part of regulatory approvals for work within the San Lorenzo River channel (e.g., Lake or Streambed Alteration Agreement from CDFW). Therefore, with the implementation of standard construction practices and other regulatory permit conditions, the Proposed Project would not constitute a substantial adverse effect on steelhead the impact would be less than significant.
ARC-3.1.13 (LCP) Wildlife Resources Beyond Sensitive Habitats – For areas which may not meet the definition of sensitive habitat contained in policy ARC-3.1.2, yet contain valuable wildlife resources (such as migration corridors or exceptional species diversity), protect these wildlife habitat values and species using the techniques outlined in policies ARC-3.1.5 and 3.1.7, or prioritize for open space designation, and use other mitigation measures or strategies identified through the environmental review process or other conservation plans and programs of the County, State and non-profit agencies.	**No Conflict.** As described in Section 4.4, Biological Resources, the Proposed Project would not interfere with fish or wildlife movement or established wildlife corridors and would have a less than significant impact on riparian habitat and other sensitive natural communities. The Proposed Project would also not conflict with an adopted habitat conservation plan or natural community conservation plan.
ARC-3.3.3 (LCP) Activities Within Riparian Corridors and Wetlands – Development activities, land alteration, and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception permit is granted per the Riparian Corridor and Wetlands Protection ordinance. As a condition of a riparian exception permit, require evidence of compliance with applicable permit or review requirements of the U.S. Army Corps of Engineers, California Department of Fish and Wildlife, and other federal or state agencies that may have regulatory authority over activities within riparian corridors and wetlands.	**No Conflict.** As described in Section 4.4, Biological Resources, the Proposed Project would have a less than significant impact on riparian habitat. Furthermore, implementation of MM BIO-5 would avoid substantial adverse effects to federally and state-protected waters by requiring a jurisdictional delineation and development of a mitigation plan approved by the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) to compensate for impacts.
ARC-3.3.5 (LCP) Setbacks from Wetlands – Prohibit development within the 100-foot riparian corridor of all wetlands. Permit exceptions to this setback only where consistent with the Riparian Corridor and Wetlands Protection ordinance, and in all cases, maximize distance between proposed structures and wetlands as feasible and mitigated. Require measures to prevent water quality degradation from adjacent land uses, as outlined in Goal ARC-4: Water Resources.	**No Conflict.** The Proposed Project could replace or rehabilitate an existing storm currently located adjacent the San Lorenzo River. As described in Section 4.4, Biological Resources, the Proposed Project would implement standard construction practices to minimize potential adverse impacts on riparian habitat and would have a less than significant impact on riparian habitat. Additionally, as described in Section 4.10, Hydrology and Water Quality, the Proposed Project would be subject to the City's Tier 4 Mandatory Requirements in the City's Storm Water BMP Manual that reflects MS4 Phase II

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	stormwater regulations. Complying with these regulations would minimize or avoid water quality degradation in the San Lorenzo River.
ARC-3.3.8 (LCP) Environmental Review for Riparian Corridor and Wetland Protection – Require environmental review of all proposed development projects affecting riparian corridors or wetlands and preparation of a Biotic Report for projects that, as proposed, may have a significant effect on the corridors or wetlands. Compliance with County regulations is generally considered to prevent the possibility of significant environmental impacts, and any biotic and/or riparian exception permit process may involve project specifications and/or conditions that would also prevent the possibility of significant environmental impacts.	**No Conflict.** See responses to Policies ARC-3.3.3 and ARC-3.3.5. A Biological Resources Existing Conditions Report (Appendix D) was prepared to support the analysis of the EIR and conclusions regarding potential riparian and wetland impacts.
ARC-3.3.9 (LCP) Management Plans for Wetland Protection – Require development in or adjacent to wetlands to incorporate the recommendations of a management plan that evaluates: migratory waterfowl use from December 1 to April 30, native fish migration, compatibility of agricultural uses and biotic and water quality protection, maintenance of biologic productivity and diversity, flood protection and hydrologic value, and the permanent protection of adjoining uplands	**No Conflict.** As described in Section 4.4, Biological Resources, MM BIO-5 requires a jurisdictional delineation and development of a mitigation plan approved by the USACE, RWQCB, and CDFW to compensate for impacts.
ARC-4.1.10 (LCP) New and/or Increased Wastewater Discharges – Approve new and/or increased wastewater discharges only if they will not degrade marine habitats; will not create hazardous or dangerous conditions; and will not produce levels of pollutants that exceed any applicable local, state or federal water quality standards.	**No Conflict.** As described in Section 4.14, Utilities and Service Systems, the Proposed Project would have no change in the amount of staffing such that there would likely be a negligible change in the amount of wastewater generation from domestic sources at the GHWTP. As such, no new or expanded wastewater treatment facilities would be required. A Wastewater Discharge Permit Amendment may be required for the Proposed Project to provide for discharges that no not exceed any applicable local, state, or federal water quality standards
ARC-4.3.1 (LCP) Minimum Stream Flows for Anadromous Fish Runs – Support programs, policies, and projects that protect and enhance dry-season minimum streamflows for anadromous fish runs to the greatest extent feasible.	**No Conflict.** As described in Section 4.4, Biological Resources, the cumulative impact analysis of the Proposed Project was evaluated in the Santa Cruz Water Rights Project EIR that includes a number of water rights modifications, minimum bypass stream flows, and infrastructure improvements that could be implemented as a result of the water rights modifications. The hydrological and fisheries analysis provided in the Santa Cruz Water Rights EIR included the proposed upgrades to the GHWTP being considered as part of the Proposed Project. The Santa Cruz Water Rights EIR concluded that the operational impacts on special-status species (including

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Policy/Objective	Potential for Proposed Project to Conflict
	special-status fish), riparian or sensitive natural communities, state or federally protected wetlands or waters, and other biological resources impacts would be less than significant.
ARC-4.3.3 (LCP) New Major Water Supply Projects – Ensure the development of new major water supply projects are adequately conditioned to protect beneficial in-stream uses and riparian habitat. For new major water supply projects located in the Coastal Zone, ensure that no development proceeds unless such projects are adequately conditioned to protect beneficial instream uses and riparian habitat with minimal reliance on technology-based mitigation measures (e.g., relying on hatchery-raised fish instead of maintaining spawning grounds).	**No Conflict.** See description under Policy ARC-4.3-1, above. The Proposed Project is not located in the Coastal Zone.
ARC-4.4.1 (LCP) Impacts from New Development on Water Quality – Do not approve new development adjacent to marshes, streams, and bodies of water if such development would cause adverse impacts on water quality that cannot be fully mitigated.	**No Conflict.** As described in Section 4.10, 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 or groundwater quality. In addition, the Proposed Project would not conflict with or obstruct implementation of a water quality control plan related to surface water.
ARC-4.4.3 (LCP) Erosion Control for Stream and Lagoon Protection – For all new and existing development and land disturbances, require the installation and maintenance of sediment basins, and/or other strict erosion control measures, as needed to prevent siltation of streams and coastal lagoons.	**No Conflict.** As described in Section 4.10, Hydrology and Water Quality, as part of the City's standard construction practices that are included in the Proposed Project, the contractor would be required to implement erosion control BMPs to avoid or substantially reduce the potential for pollutant contributions to San Lorenzo River, the closest water body to the project site. The measures address potential sediment transport, erosion and inadvertent release of petroleum products used for equipment. Furthermore, non-exempt portions of the Proposed Project would also be subject to Chapter 18.45, Excavation and Grading Regulations, of the City of Santa Cruz's Municipal Code that includes grading requirements such as erosion control (18.45.110), drainage and terracing (18.45.100), and winter (rainy season) grading requirements (18.45.040). All of these grading requirements would ensure that BMPs are incorporated to all phases of construction work that are protective of exposed soils such that the potential for erosion is minimized.
ARC-4.4.4 (LCP) Protecting Riparian Corridors and Coastal Lagoons – Require drainage facilities to infiltrate, filter, or treat stormwater runoff as needed to protect water quality for all new development within 1,000 feet of riparian corridors or coastal lagoons. Encourage vegetative-based treatments where feasible.	**No Conflict.** See descriptions under Policies ARC-3.3.3, ARC-3.3.5, ARC-4.4.3, BE-4.2.2, and BE-4.2.5

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ARC-5.1.1 (LCP) Designation of Visual Resources – Designate on the General Plan/LCP Resources and Constraints Maps (Appendix F) and define visual resources as areas having regional public importance for their natural beauty or rural agricultural character. Include the following areas when mapping visual resources: vistas from designated scenic roads, Coastal Special Scenic Areas, and unique hydrologic, geologic, and paleontologic features identified in Goal 6. Ocean views, agricultural fields, wooded forests, open meadows, ridgetops, and mountain hillside views are also public scenic assets that should be identified and considered during development review permit processes.	**No Conflict.** See description under Policy ARC-5.1-2 in this table.
ARC-5.1.2 (LCP) Development Within Visual Resource Areas – Recognize that designated visual resources of Santa Cruz County possess diverse characteristics and that the resources that are worthy of protection. Require projects in visual resource areas to be evaluated against the context of their unique environments and regulate structure height, setbacks, materials, and design to protect these resources consistent with the objectives and policies of this section.	**No Conflict**. As concluded in Section 4.2, Aesthetics, the Proposed Project's construction and operational activities would not eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor. Also, the Proposed Project would not substantially degrade the existing visual character or quality of the surrounding area (i.e., be incompatible with the scale or visual character of the surrounding area, or substantially detract from the integrity, character, and/or aesthetic character of the neighborhood).
ARC-5.1.3 (LCP) Protection of Public Vistas and Scenic Assets – Protect significant public vistas and public scenic assets as identified in Policy ARC-5.1.1, even those that are not mapped and designated as visual resource areas, scenic roads, coastal special scenic areas, or other unique features by minimizing disruption of landform and aesthetic character caused by grading operations, timber harvests, utility wires and poles, signs, inappropriate landscaping and structure design. Provide necessary landscaping to screen development that is unavoidably sited within these vistas. Proposed landscaping within public vistas should be sited and designed to retain existing public views of vistas and scenic assets over the life of the development whenever feasible, and especially for coastal designated visual resources.	**No Conflict**. See description under Policy ARC-5.1-2, above.

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ARC-5.1.5 (LCP) Preserving Agricultural Vistas – Preserve the aesthetic value of agricultural vistas. Encourage development to be consistent with the agricultural character of the community. Structures appurtenant to agricultural uses on agriculturally designated parcels are considered compatible with the agricultural character of surrounding areas.	**No Conflict.** See description under Policy ARC-5.1-2, above.
ARC-5.2.2 (LCP) Development Visible from Rural Scenic Roads – In the viewsheds of rural scenic roads, require new discretionary development, including development envelopes in proposed land divisions, to be sited out of public view, designed for compatibility with area character, and/or obscured by natural landforms and/or existing vegetation. Where proposed structures on existing lots are unavoidably visible from scenic roads, identify those visual qualities worthy of protection and require the siting, architectural design and landscaping to mitigate the impacts on those higher value visual qualities.	**No Conflict.** As described in Section 4.2, Aesthetics, the GHWTP is not within the viewshed of an officially designated state scenic highway or within the viewsheds of two County scenic roads: Graham Hill Road from Lockwood Lane to Highway 9 and Ht. Hermon Road from Scotts Valley City limits to Graham Hill Road. All other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities that would potentially affect the viewsheds from the above listed highways and roadways. The Ocean Street Extension staging area is not within the viewshed of the aforementioned scenic highways and roads and while views to the area are available from adjacent Ocean Street Extension (an unstriped, narrow and primarily residential access road), the site has been previously disturbed/partially cleared. While the Mt. Hermon Road staging area is adjacent to the two County scenic roads above, use of this site for staging by the Proposed Project would not eliminate or adversely affect significant scenic resources along these roads, as the site has been previously disturbed/partially cleared, is currently being used for a similar staging/laydown use, and is partially blocked from view by users of Graham Hill Road and Mt. Hermon Road by intervening topography and vegetation.
ARC-8.1.1 (LCP) Evaluation of Native American Cultural Sites – Protect all archaeological resources until they can be evaluated. Prohibit any disturbance of Native American Cultural Sites, archaeological sites, or identified tribal cultural resources without an appropriate permit. Maintain the Native American Cultural Sites ordinance.	**No Conflict.** As described in Section 4.5, Cultural Resources and Tribal Cultural Resources, the Proposed Project would not cause a substantial adverse change in the significance of known archaeological resources or tribal cultural resources. As part of the City's standard construction practices, which are included in the Proposed Project, the City or its contractors would be required to implement procedures in the event of an inadvertent unrecorded archaeological resource discoveries (e.g., sites, features, and/or artifacts) are discovered. The measures include the procedures for standard sensitivity training, and inadvertent discovery of archeological resources and human remains, which are described in detail in Section 3.4.4.4.

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ARC-8.1.2 (LCP) Site Surveys – Require an archaeological site survey (surface reconnaissance) as part of the environmental review process for all projects with very high site potential within the Archaeological Sensitive Areas, as designated on the General Plan and /LCP Resources and Constraints Maps (Appendix F).	**No Conflict**. A CRIER (Appendix E) was prepared with the support of a qualified archaeologist to inform the analysis of the EIR and conclusions regarding archaeological resources.
ARC-8.1.4 (LCP) Archaeological Evaluations – Require the applicant for development proposals on any identified archaeological site to provide an evaluation, by a certified archaeologist, of the significance of the resource and what protective measures are necessary to preserve important and unique archaeological sites and to mitigate any impacts of proposed development consistent with General Plan/LCP Land Use Plan objectives and policies and California state law. Avoidance shall be the preferred mitigation measure.	**No Conflict**. See descriptions under Policies ARC-8.1.1 and 8.1.2, above.
ARC-8.1.5 Accidental Discovery of Archaeological Resources – If archaeological resources or human remains are discovered accidentally during grading or construction, the activity shall cease and the property owner shall notify the proper authority in accordance with the Native American Cultural Sites ordinance.	**No Conflict**. See descriptions under Policy ARC-8.1.1, above.
ARC-8.2.3 Development Activities – For development activities on property containing historic resources, require protection, enhancement, and/or preservation of the historic, cultural, architectural, engineering, or aesthetic values of the resource consistent with regulations in the Historic Preservation ordinance as determined by the Historic Resources Commission.	**No Conflict.** As described in Section 4.5, Cultural Resources and Tribal Cultural Resources, the Proposed Project would not cause a substantial adverse change in the significance of historical built environment resources.
Policy 6.1.1 Geologic Review for Development in Designated Fault Zones (LCP) – Require a review of geologic hazards for all discretionary development projects, including the creation of new lots, in designated fault zones. Fault zones designated for review include Butano, Sagent, Zayante, and Corralitos complexes, as well as the State designated Seismic Review Zones. Required geologic review shall examine all potential seismic hazards, and may consist of a Geologic Hazards Assessment and a more complete investigation where required. Such assessment shall be prepared by County staff under supervision of the County Geologist, or a certified engineering geologist may conduct this review at the applicant's choice and expense.	**No Conflict.** Geologic conditions and potential geologic hazards were assessed in Section 4.7, Geology and Soils. Analysis contained in this section was based in part on a site-specific geotechnical report (AECOM/W.M. Lyles Co. 2023). As concluded in this section, 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. The Proposed Project would be constructed in accordance with provisions of the 2022 California Building Code, under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. Areas susceptible to liquefaction, lateral spreading, and differential compaction would be engineered to minimize seismic related impacts. In addition, construction and operation of Proposed Project

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	facilities would not increase the potential for earthquakes or seismically induced ground failure to occur, including the risk of loss, injury, or death.
Policy 6.1.2 Geologic Reports for Development in Alquist-Priolo Zones (LCP) – Require a preliminary geologic report or full engineering geology report for development on parcels within Alquist-Priolo State-designated seismic review zones.	**No Conflict.** See description under Policy 6.1.1, above.
Policy 6.1.3 Engineering Geology Report for Public Facilities in Fault Zones (LCP) – Require a fill engineering geology report by a certified engineering geologist whenever a significant potential hazard is identified by a Geologic Hazards Assessment or Preliminary Geologic Report, and prior to approval of any new public facility or critical structure within the designated fault zones.	**No Conflict.** See description under Policy 6.1.1, above.
Policy 6.1.4 Site Investigation Regarding Liquefaction Hazard (LCP) – Require site-specific investigation by a certified geologist and/or civil engineer or all development proposals of more than four residential units in areas designated as having a high or very high liquefaction potential. Proposals of four units and under and non-residential project shall be reviewed for liquefaction hazard through environmental review and/or geologic hazards assessment, and when a significant potential hazard exists a site-specific investigation shall be required.	**No Conflict.** See description under Policy 6.1.1, above.
Policy 6.1.8 Design Standards for new Public Facilities (LCP) – Require all new public facilities and critical structures to be designated to withstand the expected ground shaking during the design earthquake on San Andreas Fault.	**No Conflict.** See description under Policy 6.1.1, above.
Policy 6.2.1 Geologic Hazards Assessment for Development on or Near Slopes – Require a geologic hazards assessment of all development, including grading permits, that is potentially affected by slope instability, regardless of the slope gradient on which the development takes place. Such assessment shall be prepared by County staff under supervision of the County Geologist, or a certified engineering geologist may conduct this review at the applicant's choice and expense.	**No Conflict.** See description under Policy 6.1.1, above.
Policy 6.3.4 Erosion Control Plan Approval Required for Development (LCP) – Require approval of an erosion control plan for all development, as specified in the Erosion Control ordinance. Vegetation removal shall be minimized	**No Conflict.** See descriptions under Policies BE-4.2.2, BE-4.2.5, and ARC-4.4.3, above.

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and limited to the amount indicated on the approved development plans, but shall be consistent with fire safety requirements.	
Policy 6.3.8 On-Site Sediment Containment (LCP) – Require containment of all sediment on the site during construction and require drainage improvements for the completed development that will provide runoff control, including retention or detention where downstream drainage facilities have limited capacity. Runoff control systems of Best Management Practices shall be adequate to prevent any significant increase in site runoff over pre-existing volume and velocities and to maximize on-site collection of non-point source pollutants.	**No Conflict.** See descriptions under Policies BE-4.2.2, BE-4.2.5, and ARC-4.4.3, above. The Proposed Project would be subject to grading requirements that would ensure that BMPs addressing sediment containment and runoff control are incorporated to all phases of construction work. As discussed in Section 4.10, Hydrology and Water Quality, the Proposed Project would also be required to implement drainage control requirements would reduce post-development runoff to be no more than pre-development conditions.
Policy 6.3.9 Site Design to Minimize Grading (LCP) – Require site design in all areas to minimize grading activities and reduce vegetation removal based on the following guidelines: A. Structures should be clustered; B. Access road and driveway shall not cross slopes greater than 30 percent; cuts and fills should not exceed 10 feet, unless they are wholly underneath the footprint and adequately retained; C. Foundation designs should minimize excavation or fill; D. Building and access envelopes should be designated on the basis of site inspection to avoid particularly erodible areas; E. Require all fill and sidecast material to be recompacted to engineered standards, reseeded, and mulched and/or burlap covered	**No Conflict.** See descriptions under Policies BE-4.2.2, BE-4.2.5, and ARC-4.4.3, above.
6.5.8 Public Facilities Within Critical Fire Hazard Areas (LCP) – Discourage location of public facilities and critical utilities in Critical Fire Hazard Areas. When unavoidable, special precautions shall be taken to ensure the safety and uninterrupted operation of these facilities.	**No Conflict.** As discussed in Section 4.15, Wildfire, the Proposed Project is within a moderate Fire Hazard Severity Zone (FHSZ) as mapped by the California Department of Forestry and Fire Protection; it is also within a Wildland Urban interface (WUI), and within 2 miles of a high FHSZ (see Figure 4.15-1). Construction activities would temporarily increase the number of people on the project site but after construction, the number of staff is not expected to increase of existing conditions. During construction, the Proposed Project would implement standard construction practice #18, fire safety measures for operating equipment would be implemented during construction equipment. Per this standard construction practice, spark arrestors would be required for internal combustion engine

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	equipment, fire suppression equipment would be required on the project site during use of such mechanical equipment, and construction activities would not be conducted during high fire hazard periods (i.e., red flag warnings) unless adequate fire protection measures are implemented in compliance with federal, state, and local fire prevention and protection regulations and guidance.
Policy 7.18.4 Improvement of Water Systems (LCP) – Support water system improvement programs for storage, treatment and distribution facilities to meet necessary water supply and fire suppression requirements.	**No Conflict.** As described in Chapter 3, the underlying purpose of the Proposed Project is to provide for a modernized treatment plant that: meets contemporary building, electrical, and fire code requirements; supports the treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and Securing Our Water Future Policy (SOWF) Policy; increases the City's treatment reliability; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire and severe storms. For these reasons, the Proposed Project would provide the community a water treatment facility that would support additional storage, treatment, and water distribution for water supply and fire suppression.
Objective 9.1 Noise Exposure of New Development and Activities – Promote land use compatibility by addressing noise exposure that new development and activities will be exposed to arising from existing and anticipated future noise sources.	**No Conflict.** See descriptions under Policies HZ3.1.1 and HZ3.1.3.
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.	**No Conflict.** See descriptions under Policies HZ3.1.1 and HZ3.1.3.
Policy 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.	**No Conflict.** As described in Section 4.12, Noise and Vibration, MM NOI-1 requires that the Proposed Project implement measures to minimize operational, mechanical and process noise levels through project site design; selection of low noise generating equipment; and use of silencers/mufflers, localized barriers, extended parapets, mechanical screens, and acoustical absorption. The mitigation measure shall be incorporated to yield aggregate Proposed Project operational noise levels consistent with County thresholds. MM NOI-1 requires a noise level monitoring program be developed and implemented to verify that noise levels are consistent with applicable threshold levels at nearby noise-sensitive land uses.
Policy 9.2.2 – Require site-design and noise reduction measures for any project, including	**No Conflict.** See descriptions under Policies HZ3.1.1, HZ3.1.3, and 9.2.1.

Table 4.11-3. Review of Applicable County General Plan Policies

Policy/Objective	Potential for Proposed Project to Conflict
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.	
Policy 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 dB at neighboring sensitive land uses or if construction would occur for more than 7 days.	**No Conflict.** See description under Policy HZ3.1.3.

Mitigation Measures

As described above, the Proposed Project would not result in significant land use impacts, and therefore, no mitigation measures are required.

4.11.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative land use 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 where relevant to this topic. The geographic area considered in the cumulative analysis for this topic is northern Santa Cruz County and therefore, cumulative projects in this location are evaluated herein.

The Proposed Project would not contribute to cumulative impacts related to physical division of an established community (Significance Threshold A) because it would have no impact related to this threshold, as described above. Therefore, this significance threshold is not further evaluated.

Impact LU-2	Cumulative Land Use Impacts (Significance Threshold B). 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 conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. ***(Less than Significant)***

All of the capital investment projects, other infrastructure projects, and residential, commercial, or mixed-use projects identified in Table 4.0-1 are located in northern Santa Cruz County and could contribute to land use impacts. Although cumulative projects could have conflicts with established land use and planning documents and land use policies, they would be subject to review and approval by the City, the County, and the City of Scotts Valley, as applicable. During the review and approval process, each of these projects would be required to be designed or otherwise conditioned to avoid conflicts with adopted land use plans and ordinances. In addition, as discussed above in Impact LU-1, the Proposed Project would not conflict with the relevant City or County General Plan policies. Therefore, the impact of the Proposed Project, in combination with the past, present, and reasonably foreseeable future projects, related to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant.

4.11.4 References

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4.12 Noise and Vibration

This section describes the existing noise and vibration conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The existing conditions in this section are based on the Noise Existing Conditions Report (Dudek 2022) for the Proposed Project, prepared to support this environmental impact report (EIR). The results of the Noise Existing Conditions Report is summarized in this section and the entire report is include in Appendix F.

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. One comment letter related to noise was received from the California Department of Fish and Wildlife. The letter requested that the EIR describe operational noise and provide site-specific noise analysis in term of potential habitat disturbance (see Section 4.4, Biological Resources). One neighboring resident also provided comments related to improvement of operational noise conditions and garbage collection noise.

4.12.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2, and Figure 3-3, in Chapter 3, Project Description.

4.12.1.1 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 4.12-1.

Table 4.12-1. 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	—	—

Table 4.12-1. Typical Noise Levels Associated with Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	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 usable numbering system, the decibel (dB) scale was introduced. Sound level expressed in decibels 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, which is perceived by humans as a doubling of loudness, 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 report 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.

4.12.1.2 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_{min} (Minimum Noise Level):** The minimum instantaneous noise level during a specific period of time.
- **L_x (Statistical Descriptor):** The noise level exceeded "X" percent of a specific period of time. For example, L_{50} is the median noise level, or level exceeded 50% of the 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 10:00 PM and 7:00 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 consistency 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 7:00 PM and 10:00 PM, 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}.

- **SEL (Sound Exposure Level):** The cumulative exposure to sound energy over a stated period of time; typically, the energy of an event, summed into a 1-second period of time.

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.

4.12.1.3 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 were 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.

4.12.1.4 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.

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 vibration analysis for environmental compliance and evaluating potential impact of a project 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 4.12-2 identifies some common sources of vibration, corresponding VdB levels, and associated human perception and potential for structural damage.

Table 4.12-2. Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (Ref Qty 1 µ-in/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
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

Table 4.12-2. Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (Ref Qty 1 µ-in/sec, RMS)	Typical Events (50-Foot Setback)
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: VdB = vibration decibels; ref qty = reference quantity; µ-in/sec = micro-inch per second; RMS = root mean square.

4.12.1.5 Existing Noise Environment

The project site is characterized by a mix of industrial development for the purpose of water treatment, open space, and vegetation. The GHWTP was commissioned in 1960 after which time single-family residential land uses have been developed on the northern, eastern, and southern perimeters of the GHWTP parcel. Dense tree canopy and vegetation, and scattered residential dwellings are located beyond the western perimeter on a hillside that slopes down to Ocean Street Extension and the San Lorenzo River, approximately 0.3 miles to the west of the GHWTP parcel. The alternate sanitary sewer replacement area extends from the southwest corner of the GHWTP parcel to and along Ocean Street Extension. The utility corridor also extends from the southwest corner of the GHWTP parcel down across Ocean Street Extension and private property to the San Lorenzo River. The Ocean Street Extension staging area is located adjacent to a crematorium and low/very low-density residential land uses, off Ocean Street Extension. The Mt. Hermon Road staging area is located adjacent to heavily forested open space, as well as commercial and low/very low-density residential land uses. This section describes the existing noise environment within the vicinity of the project site.

Sensitive Noise Receptors

Certain land uses are particularly sensitive to noise, such as schools, hospitals, and rest homes. Residential land uses are also considered noise sensitive, especially during evening and nighttime hours when occupants would typically be relaxing or resting. Noise-sensitive receptors are located immediately adjacent and within close proximity to the project site.

Existing Ambient Noise Measurements

Sound level measurements at the GHWTP parcel and surrounding areas were conducted by Dudek staff during site visits conducted between May 6, 2021, and May 10, 2021, to establish baseline noise conditions to compare to Proposed Project noise levels. Specific consideration was given to document noise levels in the vicinity of nearby noise-sensitive receptors, and additionally to document existing periodic noise source levels. All noise measurements were performed in accordance with American National Standards Institute (ANSI) and American Standards for Testing and Measurement (ASTM) guidelines, at 10 locations in and around the Proposed Project area, with three long-term measurement locations

and seven short-term measurement locations which are discussed in the following sections.[1,2] As shown in Figure 4.12-1, monitoring locations were selected to provide coverage surrounding the GHWTP parcel.

Long-term noise measurements were performed using Larson Davis Laboratories (LDL) Model 831, Type 1 precision integrating sound level meters (SLMs) and a Soft dB Piccolo II Type 2 SLM. The short-term noise measurements were performed using a RION NL-62, Type 1 precision integrating SLM. Field calibrations were performed on the SLMs with acoustic calibrators before and after the measurements.[3] All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory certified calibrations traceable to the National Institute of Standards and Technology (NIST). The equipment used meets all pertinent specifications of the ANSI for Type 1 or Type 2 SLMs (ANSI S1.4-1983 [R2006]). Meteorological conditions during the monitoring periods were fair with temperatures ranging from 43°F to 78°F, light winds from 0 to 10 mph, and partly cloudy skies. No precipitation was experienced during the monitoring periods. All noise measurements were taken in advance of the initiation of construction of the Concrete Tanks Project.

Long-Term Monitoring

Long-term noise monitoring was performed at three locations immediately adjacent to the GHWTP property boundaries on the eastern and western parcel boundaries. Sound level monitoring was performed at locations representative of noise-sensitive land uses adjacent to the northern, western, and eastern GHWTP parcel boundaries. The long-term noise monitoring equipment was configured to operate in a continuous manner for two weekdays and two weekend days (4 days total, with 24 hours per time period), cataloging all noise metrics pertinent to identification and evaluation of noise levels (e.g., L_{eq}, L_{max}, L_{dn}) present in the vicinity of the monitoring locations representative of the nearby receptors. Long-term monitoring equipment at locations Long-Term (LT) 1 and LT-2 was started prior to the 7:00 PM hour, with LT-3 starting prior to the 4:00 PM hour on May 6, 2021. The variation in the measurement period start time at LT-3 was not found to result in a significant difference, as the background ambient noise environment at LT-3 was primarily driven by consistent exposure to on-site mechanical equipment noise and operation noise of the treatment plant (pumps, motors, water movement, etc.) during all daytime and nighttime hours for the duration of the monitoring at LT-3. Ambient noise levels recorded at the long-term noise monitoring locations are presented in Table 4.12-3 and shown in Figure 4.12-1. Additional measurement details can be found in Appendix F.

During the May 6 to May 10, 2021, monitoring period, on-site noise-generating activities were logged by GHWTP personnel. On Thursday, May 6, 2021, and Sunday, May 9, 2021, no noise-generating activities were notated. On Friday, May 7, 2021, and Saturday, May 8, 2021, a welder was on site working in the basement, with a welding generator located in front of the Operations and Filter Building; noise levels recorded during this time frame were reasonably consistent with other periods with no on-site noise-generating activities. On Monday, May 10, 2021, at approximately 2:20 PM (14:20), a septic pump truck was on site to service the outhouses; noise levels recorded during this time frame were reasonably consistent with other periods with no on-site noise-generating activities.

1 Long-term sound level measurements are those typically performed for a duration greater than 1 hour, and often for time periods extending for durations of 24 to 72 hours or longer. The duration of a long-term measurement is often determined based on the need to capture a time-varying sound source, multiple periods over time, or activities or operations that will continue over extended periods.

2 Short-term sound level measurements are those typically performed for a duration of less than 1 hour. Short-term measurements are used for sound sources that are able to be characterized over shorter durations, such as equipment or activities that are reasonably consistent, or a repetitive sound source able to be represented over shorter periods of time.

3 Verification of proper instrument configuration using an acoustic calibrator, typically performed prior to conducting a measurement and upon completion of a measurement period; thus, verifying proper equipment function and consistency of a measurement system during a measurement.

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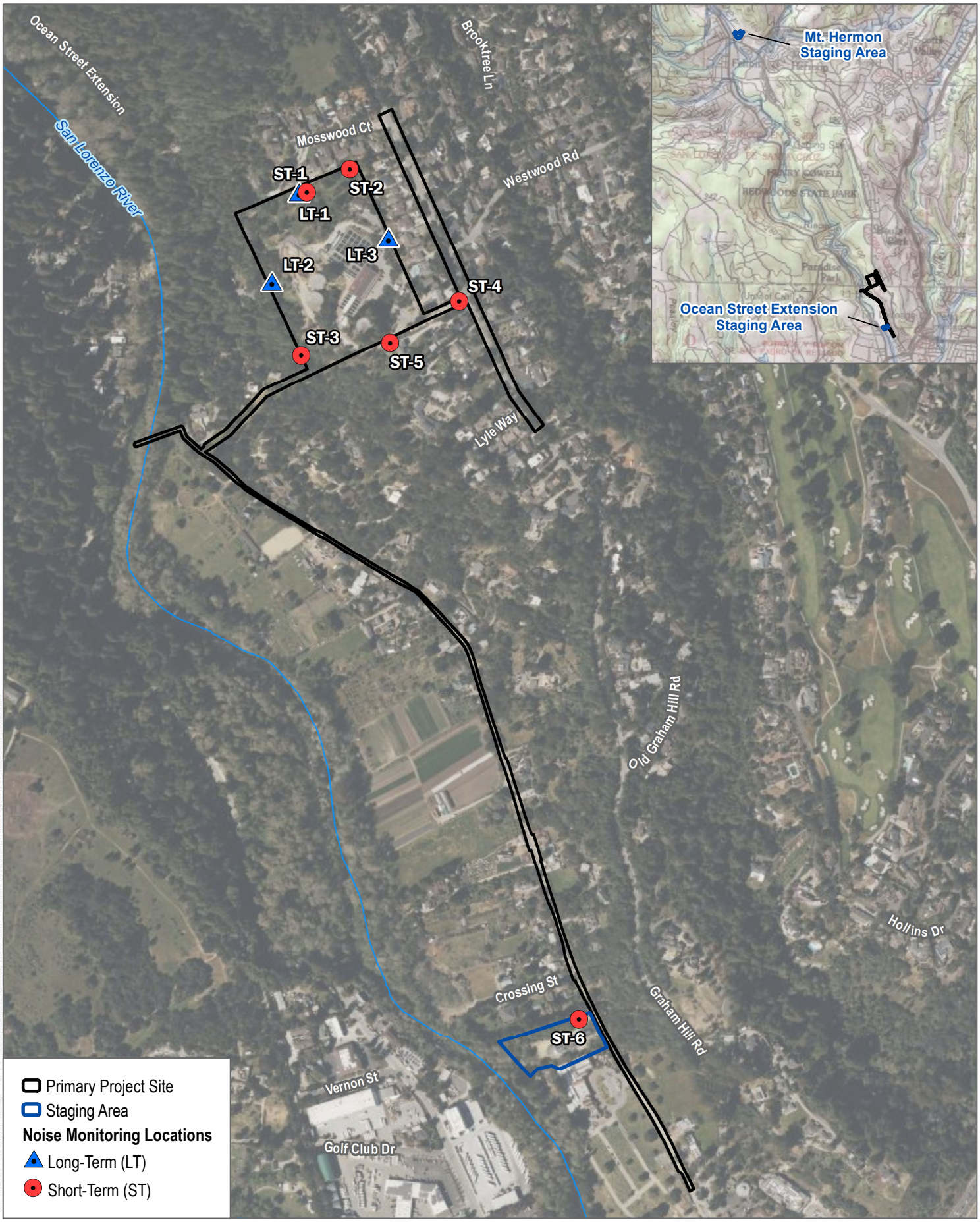

SOURCE: Bing Maps 2022, NHD

DUDEK

0 300 600 Feet

FIGURE 4.12-1

Ambient Noise Monitoring Locations for the Proposed Project

Graham Hill Water Treatment Plant Facility Improvements Project

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Table 4.12-3. Long-Term Sound Level Measurement Summary

Site	Location	Start Time 24-Hour Duration	L_{dn}	Average Noise Levels (dBA)							
				Daytime				Nighttime			
				L_{eq}	L_{max}	L_{50}	L_{90}	L_{eq}	L_{max}	L_{50}	L_{90}
LT-1	Northern GHWTP Parcel Boundary	5/6/21 7:00 PM	49.6	45.3	59.7	44.2	42.3	42.7	48.4	41.5	39.7
		5/7/21 7:00 PM	50.3	46.9	62.8	45.0	43.4	43.1	56.3	42.0	40.1
		5/8/21 7:00 PM	48.8	45.0	59.3	43.8	42.3	41.8	51.6	41.4	40.3
		5/9/21 7:00 PM	49.4	45.7	60.6	43.7	42.3	42.3	54.8	41.0	39.7
LT-2	Western GHWTP Parcel Boundary	5/6/21 7:00 PM	45.5	42.2	57.5	40.3	38.1	38.2	47.6	36.1	34.2
		5/7/21 7:00 PM	46.2	43.1	59.2	40.4	38.2	38.9	53.3	37.1	35.3
		5/8/21 7:00 PM	45.6	41.5	55.9	39.5	37.2	38.7	48.0	37.1	35.8
		5/9/21 7:00 PM	45.9	42.2	57.1	40.2	37.9	38.9	48.3	37.5	35.7
LT-3	Eastern GHWTP Parcel Boundary	5/6/21 4:00 PM	57.8	52.1	67.1	49.7	49.0	51.3	57.6	51.2	50.1
		5/7/21 4:00 PM	58.5	52.7	63.1	50.6	48.8	51.9	57.7	51.6	50.3
		5/8/21 4:00 PM	56.8	50.2	61.8	49.0	48.1	50.4	56.5	49.9	49.2
		5/9/21 4:00 PM	56.8	51.4	68.6	50.1	49.4	50.2	55.9	50.2	49.8

Source: Appendix F
Notes: dBA = A-weighted decibels; L_{dn} = Day Night noise level; L_{eq} = average equivalent noise level; L_{max} = maximum noise level; L_{50} = sound level exceeded 50% of the period; L_{90} = sound level exceeded 90% of the period

As shown in Table 4.12-3, results of the long-term noise monitoring survey showed average day-night (L_{dn}) noise levels ranged from approximately 45 dBA L_{dn}, adjacent to the western GHWTP parcel boundary, up to approximately 59 dBA L_{dn}, adjacent to the eastern GHWTP parcel boundary. The overall average ambient noise levels at the noise monitoring locations at the boundaries of the GHWTP parcel (LT-1, LT-2, and LT-3) were primarily influenced by noise generated by the GHWTP, traffic noise on Graham Hill Road, and the natural environment. The existing ambient noise levels measured at the long-term monitoring locations were consistent with the City's and County's 60 dBA L_{dn} "normally acceptable" noise exposure threshold for residential land uses (see Table 4.12-7).

Short-Term Monitoring

Short-term noise monitoring was conducted at seven locations to provide additional insight into the existing ambient noise environment, five of which surrounded the GHWTP parcel. Monitoring equipment was configured to catalog pertinent noise metrics as identified above. Ambient noise level data cataloged at the short-term monitoring locations are presented in Table 4.12-4 and locations are shown in Figure 4.12-1. Concurrent traffic and vehicle classification counts were performed during the short-term monitoring performed at location ST-4, to aid in quantifying traffic noise levels. As observed with the long-term ambient noise monitoring, the noise levels cataloged during the short-term monitoring survey were attributable to the operations of the GHWTP, traffic noise from Graham Hill Road, and the natural environment. Overall, noise exposure was primarily observed to be dependent on the monitoring location's proximity to traffic noise sources on Graham Hill Road.

Table 4.12-4. Short-Term Sound Level Measurement Summary

Site	Description	Date/Start Time[1]	L_{eq}	L_{max}	L_{50}	L_{90}
ST-1	Northern GHWTP parcel boundary, adjacent to LT-1	5/6/2021 17:55	43.9	52.9	43.2	41.1
ST-2	Northeastern corner of the GHWTP parcel boundary	5/6/2021 18:18	49.8	66.7	46.3	45.4
ST-3	Southwest portion of the GHWTP parcel boundary	5/6/2021 18:35	43.8	50.1	43.2	42.1
ST-4	Eastern portion of the GHWTP parcel boundary, adjacent to Graham Hill Road	5/7/2021 12:02	68.0	78.7	60.9	47.4
ST-5	Southern GHWTP parcel boundary	5/7/2021 12:27	46.5	59.6	44.1	42.7
ST-6	Northern boundary of Ocean Street Extension staging area	5/7/2021 12:42	46.7	61.4	43.6	41.5
ST-7	Felton Covered Bridge Park, 80-feet from Graham Hill Road center line	5/7/2021 16:30	44.5	57.3	41.4	38.5

Source: Appendix F
Notes: L_{eq} = equivalent noise level (time-averaged sound level); L_{max} = maximum noise level; L_{50} = noise level exceeded 50% of the measurement duration; L_{90} = noise level exceeded 90% of the measurement duration, also considered equivalent to the background ambient noise conditions; ST = short-term.
Temperature: 66°F, clear sky, 1-mile-per-hour calm wind.
[1] All short-term measurements were 10 minutes in duration.

Existing Sources of Noise

The GHWTP parcel is located within City limits, but the existing site is surround by unincorporated County land. The character of the ambient noise environment surrounding the GHWTP parcel is typical of quiet suburban areas, with local traffic noise and general community sounds. The primary noise sources affecting the area surrounding the GHWTP parcel are further discussed below. No railroads or significant commercial/industrial land uses are located in the immediate vicinity of the GHWTP parcel that were shown to influence the ambient noise environment.

GHWTP On-Site Noise

Noise generated from the current operations of the GHWTP were documented as part of the overall existing ambient noise monitoring survey, with noise level measurements performed at the GHWTP property boundaries adjacent to noise-sensitive land uses to the north, east and west. Measurements of individual pieces of equipment were not performed. A review of noise monitoring data showed that the ambient sound levels were attributable to motors, water movement, nearby traffic and sounds of nature (wind rustling, birds, etc.). Elevated sound level events above the ambient were found to be attributable to aircraft overflights, vehicle engine/exhaust, birds, and nearby yard maintenance. The GHWTP operational noise levels at measurement locations LT-1 and LT-2 were found to be audible in the ambient environment at times but did not generate elevated noise level events. Measurement location LT-3 experienced a constant elevation in ambient noise levels attributable to the GHWTP operations; however elevated noise level events were not documented during the measurement period.

Aircraft Noise

During the noise monitoring survey minimal aircraft overflights were observed and documented as discernable noise level events within the ambient environment; however, aircraft were not found to affect the ambient noise measurement numerical values (e.g., aircraft were recorded as individual sound level events and recordings triggered but did not result in changes in the overall hourly or 24-hour values). The project site is located approximately 7 miles southeast of the Bonny Doon Village Airpark and approximately 14 miles northwest of the Watsonville Municipal Airport. The project site and surrounding noise-sensitive receptors are not located within any currently adopted 60 or 65 dB CNEL/L_{dn} airport noise contours. 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), average daily traffic (ADT) volume data from Santa Cruz County (Santa Cruz County Regional Transportation Commission 2016). 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 Including 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 along Graham Hill Road are summarized in Table 4.12-5, at a distance of 225 feet from the centerline of Graham Hill Road, to represent traffic noise near the eastern GHWTP property boundary and 875 feet, to represent noise levels near the western GHWTP property boundary. The distances from roadway centerlines to the 60 dBA, 65 dBA, and 70 dBA L_{dn} traffic noise level contours are also presented. The location of the 60 dBA L_{dn} traffic noise contour is approximately 118 feet from the centerline of the Graham Hill Road. 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.

Table 4.12-5. Summary of Modeled Existing Traffic Noise Levels

Roadway	Segment	ADT	L_{dn} at 225 Feet[1,2]	L_{dn} at 875 Feet[1,2]	Distance to L_{dn} Contour (Feet)[2]		
					70 dBA	65 dBA	60 dBA
Graham Hill Rd	North of Ocean St	15,089	55.8	46.9	25	55	118

Source: Modeling performed by Dudek 2022, based on County of Santa Cruz 2016.
Notes: ADT = average daily traffic; L_{dn} = average day-night noise level; dBA = A-weighted decibels.

1 The modeled noise levels at the distance of 225-feet from the Graham Hill Rd. centerline represent the traffic noise exposure at the eastern property boundary. Modeled noise levels at 875-feet from the Graham Hill Road centerline represents the traffic noise exposure at the western property boundary.

2 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.

As can be seen when comparing the modeled existing traffic noise levels to the long-term ambient noise measurements in Table 4.12-3, the modeled existing traffic noise levels are relatively consistent with the measured ambient noise levels and are within the margin of error for the TNM algorithms and did not require a calibration

offset in the model. These modeled existing traffic noise levels are consistent with the observations recorded during the ambient noise monitoring survey, with the noise levels at the monitoring locations primarily being influenced by the GHWTP and roadway traffic on Graham Hill Road.

It should be noted that there is a possibility that the traffic volumes observed during the ambient noise monitoring survey were at a slightly lower ADT due to the timing of the measurements and restrictions placed on travel during the Covid-19 pandemic. Existing traffic volumes from the County were cataloged in 2015 and published in 2016 (County of Santa Cruz 2016), several years prior to implementation of travel restrictions and shelter-in-place regulations. Ambient noise level surveys, traffic calibrations[4] and observation of traffic patterns have been documented to be significantly reduced due to the travel restrictions and shelter-in-place regulations that were implemented at the state level. However, based on the traffic calibration measurement and a comparison of the modeled traffic volumes and the TNM modeling results, the modeled traffic noise levels were found to be representative of the noise levels generated by the existing traffic volumes measured during the traffic calibrations. As such, it was not necessary to apply a calibration offset to the TNM, and the model is considered validated.

While the TNM was found to be validated and reasonably predict the traffic noise levels observed during the measurement survey, and the available 2015 traffic volumes for Graham Hill Road were found to be consistent with the traffic noise levels observed during the ambient monitoring survey, It is possible that traffic volumes experienced during the measurement period could have been artificially reduced, as the noise survey was performed near the end of the Covid-19 travel restrictions. However, the ambient noise survey was performed approximately one month prior to the removal of the Covid-19 restrictions in California. While the traffic volumes following removal of the Covid-19 restrictions would potentially be increased in comparison to the traffic volumes cataloged during the restricted period and by the County in 2015, use of the 2015 volumes as existing baseline would result in any changes caused by the Proposed Project traffic volumes to have greater increases in traffic noise, providing for a conservative analysis.

Existing Sources of Vibration

Existing GHWTP operations do not incorporate equipment or activities that have been identified as generating on-site groundborne vibration levels. 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 2020a). According to the FTA and as referenced by Caltrans, typical vibration-source reference levels for loaded heavy trucks would be 0.076 in./sec. PPV at 25 feet (FTA 2018) from the centerline of the source. Due to the rapid attenuation rate of groundborne vibration and the FTA vibration-source reference levels would be consistent with the Caltrans recommended threshold criteria for damage to older residential structures of 0.3 in./sec. PPV at distances greater than 10 feet from the source.

[4] Traffic noise modeling calibration methodology consists of a sound level measurement performed adjacent to a roadway of interest, with concurrent vehicle classification counts that are used as inputs to the traffic noise model to verify that the model is producing traffic noise levels within the model's level of accuracy.

4.12.2 Regulatory Framework

4.12.2.1 Federal

In 1981, Environmental Protection Agency administrators determined that subjective issues such as noise would be better addressed at more local levels of government. No federal noise regulations are applicable to the Proposed Project.

4.12.2.2 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 published the State of California General Plan Guidelines (OPR 2003, 2017), which provides guidance for the acceptability of projects within specific L_{dn} contours. Table 4.12-6 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 4.12-6. Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA Ldn)			
	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+	—
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	—

Table 4.12-6. Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA Ldn)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	—

Source: OPR 2003/2017.
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) 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 Potential Threshold Criteria

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 (Caltrans 2020b). 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.

4.12.2.3 Local

The pertinent noise standards introduced in this section for the County of Santa Cruz (County) and the City are considered and utilized, in part, to develop the quantified significance criteria related to increases in ambient noise levels and described in Section 4.12.3.1, Thresholds of Significance. The quantified significance criteria are used to evaluate the potential impacts of the Proposed Project in Section 4.12, Impacts and Mitigation Measures.

County of Santa Cruz General Plan

The County of Santa Cruz General Plan Noise Element, Chapter 9 (County of Santa Cruz 2020a) 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 policies and standards are considered, where relevant, 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 4.12-7 in this report).

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 [L_{dn}] will remain equal to or below 60 dBA;

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 dBA;

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.

9.2.3 Incorporate noise considerations into the site plan review process, particularly with regard to parking and loading areas, ingress/egress points and refuse collection areas.

9.2.4 For all new commercial and industrial developments which would increase noise levels above the normally acceptable standards in Table 9-2 (Table 4.12-7 in this report) or the maximum allowable standards in Table 9-3 (Table 4.12-8 in this report), the best available control technologies shall be used to minimize noise levels. In no case shall the noise levels exceed the standards of Table 9-3 (Table 4.12-3 in this report).

9.2.5 The following noise mitigation strategies are preferable to construction of conventional masonry noise barriers where these strategies are a feasible option to reduce impacts on sensitive uses:

- Avoid placement of noise sensitive uses in noisy areas.
- Avoid placement of significant noise generators in noise sensitive areas.
- Increase setbacks between noise generators and noise sensitive uses.
- Orient buildings such that the noise sensitive portions of a project (e.g., bedrooms) are shielded from noise sources (such as through careful design of floor plan).
- Use sound-attenuating architectural design and building features.

- Employ technologies that reduce noise generation, such as alternate pavement materials on roadways, when appropriate.
- Employ traffic calming measures where appropriate.

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 4.12-7. Acceptable through Unacceptable Ranges of Noise Exposure by Land Use

Land Use		Community Noise Exposure L_{dn} or CNEL dBA
		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: Adapted from County of Santa Cruz 2020a, Table 9-2.
Notes: L_{dn} = day-night sound level; CNEL = community noise equivalent level; dBA = A-weighted decibel.
Outdoor noise exposure measured at the property line of receiving land use

Table 4.12-8. Maximum Allowable Noise Exposure Stationary Noise Sources

Noise Metric	Daytime[1] (7:00 AM to 10:00 PM)	Nighttime[1,2] (10:00 PM to 7:00 AM)
Hourly L_{eq} – average hourly noise level, dB[3]	50	45
Maximum Level, dB[3]	70	65
Maximum Level dB – Impulsive Noise[4]	65	60

Source: Adapted from County of Santa Cruz 2020a, Table 9-3.
Notes: dB = decibel; L_{eq} = equivalent noise level (time-averaged sound level).
The maximum allowable noise exposures for stationary noise sources were determined at the property line of the receiving land use. When determining effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.

1 Allowable levels shall be raised to the ambient noise level where the ambient level exceeds the allowable levels. Allowable levels shall be reduced 5 dBA if the ambient hourly L_{eq} is at least 10 dBA lower than the allowable level.
2 Applies only where the receiving land use operates or is occupied during nighttime hours.
3 Sound of the measurements shall be made with "slow" meter response.
4 Sound level measurements shall be made with "fast" meter response.

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 (County of Santa Cruz 2020b).

8.30.10 Offensive Noise

1. No person shall make, cause, suffer, or permit to be made any offensive noise.
2. "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.
3. 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.

13.15.040 Exemptions

A. Noise sources normally and reasonably associated with construction, repair, remodeling, or grading of any real property, provided a permit has been obtained from the County as required, and provided said activities take place between the hours of 8:00 AM and 5:00 PM on weekdays unless the Building Official has in advance authorized said activities to start at 7:00 AM and/or continue no later than 7:00 PM. Such activities shall not take place on Saturdays unless the Building Official has in advance authorized said activities, and provided said activities take place between 9:00 AM and 5:00 PM and no more than three Saturdays per month. Such activities shall not take place on Sunday or a federal holiday unless the Building Official has in advance authorized such work on a Sunday or federal holiday, or during earlier morning or later evening hours of a weekday or Saturday.

B. Emergency Work. The provisions of this chapter shall not apply to the emission of sound for the purpose of alerting persons to the existence of an emergency or in the performance of emergency work.

G. Public Health, Welfare and Safety Activities. The provisions of this chapter shall not apply to construction, maintenance and repair operations conducted by public agencies and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public and to protect the public health, welfare and safety, including but not limited to trash collection, street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, sidewalks, etc.

13.15.050 General Noise Regulations and Unlawful Noise

A. No use, except a temporary construction operation, shall be permitted which creates noise which is found by the Planning Commission not to conform to the noise parameters established by Table 9-2 and Table

9-3 of the Santa Cruz County General Plan (see Table 4.12-7 and Table 4.12-8) beyond the boundaries of the project site at standard atmospheric pressure.

B. Emergency stand-by generators shall only be operated during power outages and for other temporary purposes as defined in this chapter. In residential zone districts, an emergency stand-by generator shall be fueled by natural gas or propane, and operation is prohibited between the hours of 10:00 p.m. and 7:00 a.m. unless it is necessary for life support or to support other necessary medical needs, equipment, or medication. Residential installations shall meet the property line setbacks in the table below (in this code section).[5] A reduction of these setback requirements may be approved if noise attenuation measures are included to reduce noise levels to a maximum exterior noise level of 65 dBA at the nearest property line. In no case shall the generator be located closer than the minimum property line setbacks in the zone district.

13.15.070 Noise Generating Land Use

A. New commercial and industrial development that would increase noise levels above the normally acceptable range in Table 9-2 or the levels in Table 9-3 of the Santa Cruz County General Plan Noise Element (see Table 4.12-7 and Table 4.12-8) shall require acoustic studies to determine the noise reduction requirements to be included as conditions of approval. Noise levels shall not exceed the standards in Table 9-3 (see Table 4.12-5), and require, as conditions of approval, site design and sound reducing measures if the project would:

   (1) Increase the noise level at existing noise-sensitive receptors or areas by five (5) dB L_{dn} or more, where the post-project L_{dn} would remain equal to or below 60 dB.

   (2) Increase the noise level at existing noise-sensitive receptors or areas by three (3) dB L_{dn} or more, where the post-project L_{dn} would exceed 60 dB.

B. The standards in this section shall not limit the ability of the County to impose conditions of approval on projects that increase noise levels at existing noise-sensitive receptors or areas by any amount.

13.15.080 Exterior Noise Standards

New development shall not be exposed to noise levels that exceed the normally acceptable levels in Table 9-2 of the Santa Cruz County General Plan Noise Element (see Table 4.12-7), which establishes acceptable through unacceptable ranges of noise exposure by land use.

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 Ldn for all residential uses, consistent with California noise insulation standards. Figure 2 of the Hazards, Safety, and

[5] See Santa Cruz County Code Section 13.15.050 for the referenced property line setbacks that range from 15 feet to 70 feet depending on the noise level of the generator.

Noise chapter indicates that exterior noise levels up to 60 dBA Ldn are normally acceptable for residential development and exterior noise levels up to 65 dBA Ldn are normally acceptable for multi-family residential and transient residential development; with noise levels up to 70 dBA Ldn considered conditionally acceptable. Hazards, Safety, and Noise chapter Policy HZ3.2.3 reiterates the "noise level target" of 65 dBA Ldn 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 2021) include provisions for noise regulations. The former prohibits excessive noise during nighttime hours (10:00 PM through 8:00 AM) (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 to commence or be completed between said hours. Additionally, at a minimum, notice of the dates and times such tasks will be undertaken shall be provided to all residents, tenants and property owners who occupy or own property within 300 feet of the construction site at which such tasks will be performed.

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. These allowable noise standards are adjusted by +5 dB for noise levels that are considered to be "containing piercing", "noise that is impulsive", or "contains speech, music or other information content".

4.12.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the Proposed Project related to noise and vibration. 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 noise and vibration are based on Appendix G of the CEQA Guidelines, as presented below. 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.

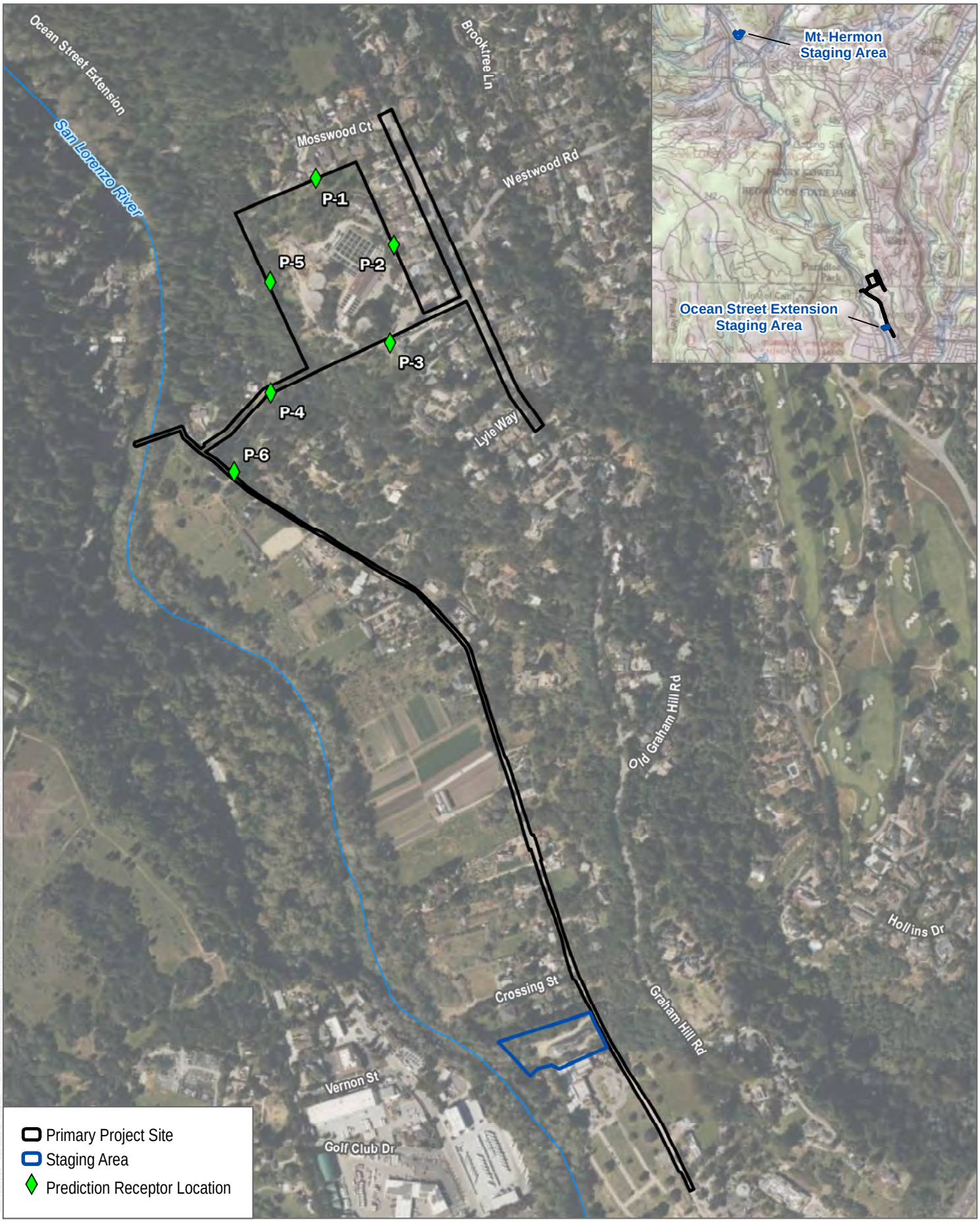
D. Expose people residing or working in the project area to excessive noise levels in a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport.

In analyzing noise and vibration impacts associated with the Proposed Project, pertinent noise standards introduced in the City and County of Santa Cruz General Plans and Codes, discussed above, have been considered and utilized to develop the following quantified significance criteria for Significance Thresholds A B, and C above.

- 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, which is typically the nearest receptors to the Proposed 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 4.12-8. These thresholds are referred to as "relative thresholds" in Table 4.12-9 below. (These thresholds are consistent with those outlined by the County and would provide consistency with the City relative increase standards.)
- Significance Threshold B. The Proposed Project would result in the generation of substantial temporary or permanent noise levels in excess of the following standards, in the vicinity of the project:
  - For temporary construction activities on the project site, a significant impact would result 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.
  - For operational traffic noise associated with the Proposed Project, a significant impact would result if traffic noise results in an increase of 3 dB to 5 dB L_{dn} or more above existing conditions depending on whether the existing ambient levels are above or below 60 dBA L_{dn} respectively, based on Santa Cruz County Code Section 13.15.070.
  - For other operational noise, a significant impact would result if operational noise levels exceed the County's stationary noise thresholds (Table 4.12-8); these thresholds are referred to as "absolute thresholds" in Table 4.12-9 below. Additionally, operational noise would be significant if such noise levels exceed the relative increase criteria outlined in Section 13.15.070 of the County Code and provided above for Significance Threshold A. The City does not have any standards that would be applicable to the Proposed Project.

- **Significance Threshold C.** The Proposed Project would result in the generation of a substantial temporary ground borne noise or vibration levels in the vicinity of the project if it would:
  - For structures located outside of the project site, a significant impact would result if groundborne noise or vibration levels exceeded the Caltrans guidance criteria that suggests 0.3 in/sec PPV as a threshold level for a damage threshold for older residential structures (Caltrans 2020b).

Table 4.12-9 provides the absolute and relative thresholds for operational noise for Significance Thresholds A and B at the receptor locations (shown in Figure 4.12-2) that reflect existing ambient noise levels. For the absolute thresholds, the maximum allowable noise exposure is based on noise levels presented in Table 4.12-8 unless the ambient noise level already exceeds the allowable levels, such as is the case at receiver site P-2. In that case, the existing ambient becomes the threshold for receiver site P-2, as shown in Table 4.12-9. For the relative thresholds, Table 4.12-9 presents the thresholds with the addition of the relative increase (i.e., +5 dBA L_{dn} or +3 dBA L_{dn}), as described above for Significance Threshold A.



SOURCE: Bing Maps 2022, NHD

DUDEK

0 300 600 Feet

FIGURE 4.12-2

Prediction Receptor Locations

Graham Hill Water Treatment Plant Facility Improvements Project

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Table 4.12-9. Operational Noise Level Thresholds at Representative Receptor Locations

Receiver		Absolute Thresholds, dBA[1]				Relative Thresholds, dBA[2]	
		Day: 7:00AM - 10:00PM		Night: 10:00PM - 7:00AM			
		Existing Ambient	Threshold	Existing Ambient	Threshold	Existing Ambient	Relative Increase
No.	Description	$L_{eq,\ D}$	L_{eq}/L_{max}	$L_{eq,\ N}$	L_{eq}/L_{max}	L_{dn}	L_{dn}
P-1	Northern GHWTP Parcel Boundary, Adjacent to 155 Mosswood Court	45.7	50 / 70	42.5	45 / 65	49.5	+5 dB (54.5)
P-2	Eastern GHWTP Parcel Boundary, Adjacent to 739 Graham Hill Road	51.6	51.6 / 70	51.0	51 / 65	57.5	+3 dB (60.5)
P-3	Southern GHWTP Parcel Boundary, Adjacent to 713 Graham Hill Road	46.5	50 / 70	42.4	45 / 65	50.3	+5 dB (55.3)
P-4	Southwest GHWTP Parcel, Adjacent to 50 Quail Crossing	43.8	50 / 70	38.5	45 / 65	45.6	+5 dB (43.5)
P-5	Western GHWTP Parcel Boundary, Adjacent to 69 Quail Crossing	42.3	50 / 70	38.7	45 / 65	45.8	+5 dB (50.8)
P-6	Southeast of Alternate Sanitary Sewer Lateral Replacement Area, Adjacent to 2234 Ocean Street	46.7	50 / 70	41.6	45 / 65	48.7	+5 dB (46.6)

Sources: County of Santa Cruz 2020a, 2020b (compiled by Dudek 2023).
Notes: dBA = A-weighted decibels; $L_{eq,D}$ = energy-equivalent hourly average daytime (7:00 AM–10:00 PM) sound level; $L_{eq,N}$ = energy-equivalent hourly average nighttime (10:00 AM–7:00 AM) sound level; L_{dn} = average day/night sound level, with 10 dB nighttime penalty from 10:00 PM to 7:00 AM.
1 Maximum allowable noise exposure levels (L_{eq} and L_{max}) affected by stationary noise sources, for daytime and nighttime periods. Presented as Table 4.12-8 of this section.
2 Relative increases in operational noise levels at existing noise-sensitive receptors effected by any project, as presented in County of Santa Cruz General Plan Policy 9.2.2 and Code Section 13.15.050.

4.12.3.2 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 transportation analysis and air quality analysis prepared for the Proposed Project; and data obtained during on-site noise monitoring. 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 project site.

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. Standard construction practice #17 (nighttime construction) applies to the Proposed Project. Where applicable, this practice and its effectiveness in avoiding or minimizing impacts related to construction noise are described in 4.12.3.3, Project Impact Analysis.

Construction

A principal source of project-generated noise would be associated with construction activities on the project site; 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.

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 within the *Transportation and Construction Induced Vibration Guidance Manual* (Caltrans 2020) and the relative distance to potentially sensitive receptors from a given vibration source.

Operation

Potential effects associated with long-term (operation-related) noise sources were assessed based on project documentation, site reconnaissance data and reference noise level for the various noise sources. The ISO 9613 sound propagation model for stationary noise sources was implemented for this project. This international standard propagation model is used in the U.S. and abroad for stationary noise sources, due to its accurate and reliable propagation equations, which account for variations in terrain and ground type.

Traffic noise levels for the roadway network in the project vicinity were modeled using the FHWA traffic noise prediction algorithms. Baseline traffic volume data was obtained from County traffic surveys and the potential for traffic impacts were evaluated qualitatively, through comparison of the trip generation of the Proposed Project to the baseline traffic volumes.

4.12.3.3 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.

- **Exposure of People Working or Residing in the Area to Excessive Aircraft Noise (Significance Threshold D).** The project site is located approximately 7 miles southeast of the Bonny Doon Village Airpark and approximately 14 miles northwest of the Watsonville Municipal Airport. The project site and surrounding noise-sensitive receptors are not located within any currently adopted 60 or 65 dB CNEL/L_{dn} airport noise contours. As such, noise exposure associated with existing and future aircraft operations in the area is not a substantial contributor to the ambient noise environment, and there would be no impact.

Project Impacts

Impact NOI-1	Substantial Permanent Increase in Ambient Noise Levels (Significance Threshold A). The Proposed Project could result in a substantial permanent increase in noise levels in the project vicinity above ambient levels without the project. ***(Potentially Significant)***

This impact analysis addresses permanent noise associated with operation of the Proposed Project after construction is completed. Temporary construction noise is evaluated in Impact NOI-2 below.

Long-Term Operational Traffic Noise

Long-term operation of the Proposed Project is not anticipated to result in substantial changes to the amount of traffic on the roadway network compared to existing operations, as operations would remain similar to current operation and maintenance activities. Routine maintenance of the facility is expected to continue, consisting of trips to and from the site by plant personnel in personal vehicles and small trucks, maintenance vehicles, and haul trucks for delivery and removal of process elements, consistent with current operations and any increase would be nominal. Specifically, the upgraded GHWTP would require two new daily truck trips for additional chemical deliveries, future granular activated carbon replacement, and for hauling dewatered solids off-site.

The long-term operations of the Proposed Project would need to result in a doubling of roadway traffic volumes in the vicinity for there to be a significant impact associated with traffic noise (i.e., increase of 3 dB or 5 dB). As operation of the Proposed Project would not result in a substantial increase of vehicle trips, traffic noise levels associated with the long-term operation of the Proposed Project would be less than significant.

Operational Process Noise

As discussed in Chapter 3, Project Description, the Proposed Project would replace the majority of the existing water treatment processes at the GHWTP along with the associated infrastructure with modern facilities. The Proposed Project would provide for a modernized treatment plant that: meets contemporary code requirements; improves the ability to treat wet season water to facilitate water supply augmentation; increases the City's treatment reliability; and improves the plant's ability to treat variable and degraded source water quality conditions. The Proposed Project would be designed to reliably produce a maximum of 18.2 mgd, under a broad range of source water conditions. While, the existing GHWTP has a rated capacity of 24 mgd, it does not operate at that capacity. Figure 3-6 provides an illustration of the proposed site layout, which indicates elements of the GHWTP that are existing or currently under construction and proposed new and upgraded elements of the Proposed Project. Proposed Project elements identified as potential noise sources associated with the updated facility are provided below in Table 4.12-10.

Table 4.12-10. Potential Noise Sources Associated with the Proposed Project

Equipment Type[1]	Location	Horsepower	Sound Pressure Level, dB	Reference Distance, Feet
10 - Sedimentation Tank				
First Stage Flocculator	Outside Submerged	5	77.6	50
Second Stage Flocculator	Outside Submerged	0.75	66.8	50
Third Stage Flocculator	Outside Submerged	0.25	62.5	50
15, 72 - LOX Tank				
LOX Pressure Blow-Off[2]	Outside	-	-	50
20 - Ozone Building				
Electrical Room AC Cond	Outside	10	75.0	50
Storage/Supply Room Fan	Rooftop	0.125	59.7	3
Hydrogen Peroxide Room	Rooftop	0.33	59.7	3
Ozone Room Fan (3)	Rooftop	<1 (ea.)	66.1 (ea.)	3
Ozone Building - O3 generators	1st Floor	-	55.0	3
Ozone Building - Closed Loop Cooling Pump	1st Floor	5	72.6	50
Ozone Building - Open Loop Cooling Pump	1st Floor	5	72.6	50
Ozone Building – Side Stream Pumps	1st Floor	25	78.2	50
25 - Filter Building Wing				
Filter Room (5)	Wall	1.5 (ea.)	65.0 (ea.)	3
Filter Room	Wall	1	66.1	3
Air Wash Blowers	Basement	75	82.0	50
25 - Operations Building Wing				
Heat Pump Ventilator Unit	Outside	2	70.9	50
Heat Pump Condensing Unit	Outside	20	82.0	5
AC Condensing Unit	Outside	25	78.2	50
Printer Room Exhaust Fan	Outside	0.25	62.2	50
25 - Administration Building Wing				
Heat Pump Ventilator Unit	Outside	50	80.6	50
Heat Pump Condensing Unit	Outside	20	82.0	5
Sump Pump test	Outside	0.333	63.2	50
Future GAC Pumps				
Future Granular Activated Carbon (GAC) Feed Pump Station	Outside	75	82.0	50

Table 4.12-10. Potential Noise Sources Associated with the Proposed Project

Equipment Type[1]	Location	Horsepower	Sound Pressure Level, dB	Reference Distance, Feet
GAC Area Sump Pumps	Below GAC Pumps and Vessels	7.5	74.0	50
50 - Chemical Storage and Feed Building				
Air Conditioning	Rooftop	10	75.0	50
Pot Perm	Rooftop	0.2	59.7	3
Chem Room (3)	Rooftop	0.5 (ea.)	63.8 (ea.)	3
Compressor Room	Rooftop	0.8	61.2	3
Air Compressors	1st Floor Near Rollup Door	0.5	64.6	50
55 - Lamella Clarifier				
Lamella Clarifier	Flash Mixer	0.5	64.6	50
Lamella Clarifier	Flocculators	0.5	64.6	50
60 - Equalization Tank				
Thickened Solids Equalization Tank - Feed Pump	Equalization Tank	7.5	74.0	50
Thickened Solids Equalization Tank - Feed Pump	Equalization Tank	5	72.6	50
65 – Solids Dewatering Building				
Dewatered Solids Room	In-Line	1	62.6	3
Dewatering Room	Roof	1.5	68.9	3
Supply Fan	Outside	0.33	63.2	50
Exhaust Fan	Outside	0.33	63.2	50
Sample Room Ductless AC Unit	Outside	0.72	47.0	5
Electrical Room AC Cond	Rooftop	10	75.0	3
Centrifuge Main Motor	Inside Bay	50	68.9	3
Centrifuge Secondary Motor	Inside Bay	10	75.0	3
85 - Maintenance Building				
General	Upblast	0.25	66.0	50
Welding Hood	Roof	1.5	71.2	3
Welding Area	In-Line	0.33	61.2	3

Source: Dudek 2023, BBN 1982.
Notes: dBA = A-weighted decibels; Lw = Sound Power Level.
1. The numbers listed for the buildings and structures are shown in the site layout in Figure 3-6 (see Chapter 3, Project Description).
2. Liquid oxygen (LOX) tank pressure blow-off is an intermittent, short-duration noise source and therefore this source was not incorporated into the three-dimensional noise simulation model developed to evaluate on-going operational noise of the Proposed Project.

Based on the proposed site layout shown in Figure 3-6 and the source noise levels for the potential noise sources shown in Table 4.12-10, a three-dimensional noise simulation model was developed for the Proposed Project.

The model incorporated a three-dimensional geometric representation of the project area developed from digital terrain information, available GIS information, aerial photography and information provided by the City, while taking into account the effects of relative exposure, shielding due to intervening objects (i.e., buildings, hills, trees), and ground effects due to areas of hard ground (i.e., pavement, water) and soft ground (i.e., grass, field, forest). Noise prediction receivers were placed within the noise model, representing the nearby noise-sensitive receptors (e.g., single-family residences, multifamily residences, residential outdoor activity areas, schools). Modeled, unmitigated operational equipment noise levels are summarized in Table 4.12-11.

Table 4.12-11. Unmitigated Operational Noise Levels at Representative Receptor Locations

Receiver		Existing Ambient		Modeled Project Noise Levels, dBA		
No.	Description	L_{eq}	L_{dn}	L_{eq}	L_{dn}	Change
P-1	Northern GHWTP Parcel Boundary, Adjacent to 155 Mosswood Court	45.7	49.5	**61**	**66**	**16.5**
P-2	Eastern GHWTP Parcel Boundary, Adjacent to 739 Graham Hill Road	51.6	57.5	**65**	**71**	**13.5**
P-3	Sothern GHWTP Parcel Boundary, Adjacent to 713 Graham Hill Road	46.5	50.3	**65**	**72**	**21.7**
P-4	Southwest of GHWTP, Adjacent to 50 Quail Crossing	43.8	45.6	**52**	58	**12.4**
P-5	Western GHWTP Parcel Boundary, Adjacent to 69 Quail Crossing	42.3	45.8	**56**	**62**	**16.2**
P-6	Southeast of Alternate Sanitary Sewer Lateral Replacement Area, Adjacent to 2234 Ocean Street	46.7	48.7	48	54	**5.3**

Source: Dudek 2023.
Notes: dBA = A-weighted decibels; Leq = equivalent hourly average noise level.
Bold – indicates exceedance of thresholds in Table 4.12-9.

As shown in Table 4.12-11 unmitigated noise levels generated by rooftop noise sources and noise sources exterior to the Proposed Project buildings exceed the County's absolute thresholds for stationary noise sources of 50 dBA L_{eq} and 70 dBA L_{max} during daytime hours (7:00 AM to 10:00 PM) and 45 dBA L_{eq} and 65 dBA L_{max} during nighttime hours (10:00 PM to 7:00 AM), as shown in Table 4.12-9. Additionally, the Proposed Project operational mechanical noise sources in comparison to the ambient noise environment would range from approximately +5 dB above the existing ambient noise environment, to increases ranging to approximately +22 dB, which would exceed the relative increase thresholds of +3 and +5 dB. Further, as indicated in Table 4.12-10, the LOX tank pressure blow-off is not a continuous source of onsite noise emission like the pumps and other equipment and therefore the blow-off was not incorporated into the three-dimensional model developed to evaluate on-going operational noise of the Proposed Project. The LOX tank pressure blow-off would be expected to occur only occasionally during Proposed Project operation and involve a short-duration discharge event of 60 to 180 seconds (Praskey 2016). However, noise emission levels from these events have the potential to exceed the County's maximum absolute thresholds for stationary noise sources of 70 dBA L_{max} during daytime hours (7:00 AM to 10:00 PM) and 65 dBA L_{max} during nighttime hours (10:00 PM to 7:00 AM), as shown in Table 4.12-9. Therefore, the Proposed Project would generate a substantial permanent increase in noise levels due to new stationary/operational noise sources with exposure to the outdoor environment and the impact would be potentially significant.

Implementation of Mitigation Measure (MM) NOI-1 (Operational Mechanical and Process Noise) would avoid substantial permanent increases in noise levels through project site design; selection of low noise generating equipment; use of silencers/mufflers, localized barriers, parapets and mechanical screens, and/or acoustical absorption sufficient to avoid exceedance of identified noise thresholds. Implementation of a noise level monitoring program shall also be required to verify that noise levels produced by equipment associated with on-going operations achieve consistency with applicable threshold levels at nearby noise-sensitive land uses. Therefore, implementation of MM NOI-1 would reduce the impact of the Proposed Project related to permanent increases in noise levels to less than significant.

Mitigation Measures

Implementation of the following mitigation measure would reduce potentially significant impacts of the Proposed Project related to permanent increases in ambient noise levels to less than significant, as described above.

MM NOI-1: Operational Mechanical and Process Noise (applies only to the GHWTP). The Proposed Project shall implement the following measures to minimize operational, mechanical and process noise levels through project site design; selection of low noise generating equipment; and use of silencers/mufflers, localized barriers, extended parapets, mechanical screens, and acoustical absorption, as outlined below. One or more of the following measures shall be incorporated into project site design to yield aggregate Proposed Project operational noise levels that are consistent with quantified County absolute and relative thresholds (see Table 4.12-9), as measured at the nearest sensitive receptor):

- As consistent with manufacturer performance requirements or guidance, all operating mechanical equipment with the potential to contribute to the generation of excessive offsite noise exposure levels shall be fitted with intake and exhaust silencers, gas vent silencers, shrouds, or acoustical enclosures.
- To exploit interior-to-exterior sound transmission losses associated with a building exterior shell (and its inherent material assemblies and penetrations for access, natural lighting, and ventilation or exhaust), mechanical equipment shall be located within the associated building. Building penetrations such as fresh air intakes and exhausts shall be fitted with acoustical louvers.
- Noise generating equipment not located within a building or within adjacent service yards incorporating acoustical barriers shall be shielded from direct line-of-site to nearby noise-sensitive uses through the use of localized noise barriers, rooftop parapets, sound rated mechanical screens or intervening structures.
- Mechanical equipment not located within a building or an acoustically rated enclosure capable of reducing exterior noise level exposures consistent with applicable thresholds, as specified above, shall be located at a sufficient distance from nearby noise-sensitive receptors, so that mechanical equipment would be reduced to be consistent with the applicable thresholds.

A noise level monitoring program shall be developed and implemented by the City to verify that noise levels produced by equipment associated with on-going operations of the facility achieve consistency with applicable threshold levels at nearby noise-sensitive land uses. The monitoring program shall be conducted initially after full operations are underway and subsequently, if noise complaints are received and directly attributable to the new equipment. If monitored noise levels exceed the applicable threshold levels at nearby noise-sensitive land uses, potential additional treatments shall be implemented including but not limited to adding additional mass to building shells, installing acoustic absorption within a building, and/or installing enclosures around specific

pieces of equipment, such that consistency with applicable threshold levels at nearby noise-sensitive land uses is achieved.

Impact NOI-2	Substantial Temporary or Permanent Increase in Ambient Noise Levels in Excess of Applicable Standards (Significance Threshold B). The Proposed Project would result in substantial noise levels in the vicinity of the project, in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies. ***(Potentially Significant)***

Construction Noise

The Proposed Project would generate noise associated with the operation of heavy construction equipment and construction related activities in the project vicinity. Construction noise levels in the project vicinity would fluctuate depending on the particular type, number, and duration of usage for the various pieces of equipment, as well as the relative exposure and distance between the source and receptors.

The effects of construction noise depend largely on the types of construction activities occurring on any given day, noise levels generated by those activities, distances to noise-sensitive receptors, and the existing ambient noise environment in the vicinity of the receiver. Construction generally occurs in several discrete stages, with each stage using a varied construction equipment fleet mix with their associated noise. These stages alter the characteristics of the noise generation on the project site and in the surrounding community for the duration of the construction stage. The Proposed Project is anticipated to include the following stages: (1) demolition; (2) site preparation; (3) grading; (4) building construction; (5) paving; (6) architectural coating; (7) linear, grubbing and land clearing; (8) linear, grading and excavation; (9) linear, drainage, utilities and sub-grade; and (10) linear, paving.

Construction is assumed to begin in 2025 through 2029 after site preparation occurs at the end of 2024 and would involve construction activities at the GHWTP facility (stages 1 through 6 as defined in the preceding paragraph) and along the alignment of the storm drain within the utility corridor and alternate sanitary sewer lateral replacement construction operations (stages 7 through 10). The specific construction requirements for buildout of the Proposed Project may be refined as construction details are developed further. Development of the Proposed Project elements are anticipated to incorporate the use of typical construction sources such as backhoes, dozers, excavators, loaders, and other related equipment based on assumptions provided by the City. The Proposed Project is not anticipated to require the use of blasting or driven piles, and where additional foundational support is necessary, drilled piers, retaining walls and other non-impact techniques are discussed within the geotechnical report prepared for the Proposed Project (AECOM/W.M. Lyles Co. 2023).

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in one of two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations (e.g., compressor or generator). Thus, it is necessary to determine the location of stationary sources during specific stages of construction, and the effective acoustical center of operations for mobile equipment during various stages of the construction process. The effective acoustical center is the idealized point from which the energy sum of all construction activity noise near and far would appear to originate. As one increases the distance between equipment and/or between areas with simultaneous construction activity, dispersion and distance attenuation reduce the effects of separate noise sources added together.

Operational characteristics of heavy construction equipment are additionally typified by short periods of full-power operation followed by periods of operation at lower power, idling, or powered-off conditions. These characteristics are accounted for through the application of typical usage factors (operational percentage) applied to the FHWA and FTA reference maximum noise levels, resulting in average L_{eq} levels for the equipment or operation. The reference FHWA and FTA noise levels from various types of construction equipment, acoustical usage factors, and average L_{eq} levels are provided in Table 4.12-12.

Table 4.12-12. Noise Levels from Construction Equipment

Equipment Type	Usage Factor (%)	Noise Levels (dBA) at 50 feet	
		L_{max}	L_{eq}
Air Compressor	40	80	76
Backhoe	40	80	76
Compactor	20	80	73
Concrete Pump	20	82	75
Concrete Saw	20	90	83
Crane, Mobile	16	85	77
Dozer	40	85	81
Forklift	40	85	81
Front-End Loader	40	80	76
Generator	50	82	79
Grader	40	85	81
Mounted Impact Hammer (Hoe Ram)	20	90	83
Paver	50	85	82
Pneumatic Tools	50	85	82
Rock Drill	20	85	78
Roller	20	85	78
Scraper	40	85	81
Trucks (Flatbed)	40	84	80
Water Pump	50	77	74
Welder	40	73	69

Source: DOT 2006, FTA 2018.
Notes: dBA = A-weighted decibels; L_{max} = day-night average noise level; L_{eq} = average equivalent noise level.
All equipment fitted with a properly maintained and operational noise control device, per manufacturer specifications.

Project-specific construction stage scheduling assumptions provided by the City were used to develop an anticipated construction equipment fleet mix and schedule for the Proposed Project. Based on the anticipated construction schedule and the assumptions used in the Air Quality analysis, timing of the construction stages which may be performed concurrently, are provided in Table 4.12-13. Notably, Table 4.12-13 conservatively assumes condensed phases that occur for the entire duration of the activity for simplicity; however, actual construction would be more episodic based on the facility components being constructed at any one time. For instance, demolition is anticipated to be performed intermittently throughout the first 2 years of the Proposed Project as structures are sequentially retrofitted and then put back online, and grading would occur intermittently on a structure-by-structure basis.

Table 4.12-13. Anticipated Construction Stage Schedule

Ops. Period[1]	GHWTP On-Site Construction Stages						Linear Construction Stages			
	Demo	Site Prep	Grading	Bldg. Const	Paving	Arch. Coating	Grubbing & Land Clearing	Grading & Excavation	Drainage, Utilities, & Sub-Grade	Paving
Q4, 2024		✔								
Q1, 2025	✔		✔	✔			✔	✔		
Q2, 2025	✔		✔	✔				✔	✔	✔
Q3, 2025	✔			✔		✔				
Q4, 2025				✔		✔				
Q1, 2026				✔						
Q2, 2026				✔						
Q3, 2026				✔						
Q4, 2026				✔						
Q1, 2027				✔						
Q2, 2027				✔						
Q3, 2027				✔						
Q4, 2027				✔						
Q1, 2028				✔						
Q2, 2028				✔						
Q3, 2028				✔						
Q4, 2028					✔					

Notes: GHWTP = Graham Hill Water Treatment Plant.

[1] Q1 = Yearly Quarter 1, January 1 thru March 31; Q2 = Yearly Quarter 2, April 1 thru June 31; Q3 = Yearly Quarter 3, July 1 thru September 30; Q4 = Yearly Quarter 4, October 1 thru December 31.

Based on the modeled construction noise levels, the loudest individual construction stages are the demolition stage and the linear grading & excavation stage. However, due to the construction schedule containing overlapping stages, Quarter 2 of 2025 (April 1 through June 31), incorporating on-site GHWTP demolition, grading, and building construction stages, along with the linear construction stages grading and excavation, and drainage, utilities, and sub-grading, and paving, would have concurrent construction operations included in the construction schedule, which are modeled to produce the loudest construction operations. The modeled noise exposure levels at the listed noise-sensitive receptors due to the individual construction stages and the logarithmic combination of these multiple stages are shown in Table 4.12-14 for the anticipated loudest quarter, Quarter 2 of 2025 per the construction stage schedule.

Table 4.12-14. Construction Noise Levels (dBA L_{eq}) at Representative Receptor Locations (Anticipated Loudest Quarter)

Receiver		GHWTP On-Site Construction		Linear Construction		Combined Construction Stage Levels (Avg. Daytime Ambient)[1]
No.	Description	Demo	Grading	Grading & Excavation	Drainage, Utilities, & Sub-Grade	
P-1	Northern GHWTP Parcel Boundary, Adjacent to 155 Mosswood Court	**61.8**	**60.3**	52.4	52.8	**64.8** (45.7)
P-2	Eastern GHWTP Parcel Boundary, Adjacent to 739 Graham Hill Road	**62.9**	**61.4**	59.2	59.6	**67.3** (51.6)
P-3	Southern GHWTP Parcel Boundary, Adjacent to 713 Graham Hill Road	**68.4**	**66.9**	57.7	58.0	**71.5** (46.5)
P-4	Southwest of GHWTP, Adjacent to 50 Quail Crossing	**61.0**	59.4	**74.0**	**74.4**	**77.4** (43.8)
P-5	Western GHWTP Parcel Boundary, Adjacent to 69 Quail Crossing	**72.2**	**70.1**	53.5	53.8	**75.0** (42.3)
P-6	Southeast of Alternate Sanitary Sewer Lateral Replacement Area, Adjacent to 2234 Ocean Street	54.2	52.7	**64.3**	**64.7**	**67.9** (46.7)

Source: Dudek 2023.
Notes: dBA = A-weighted decibels; L_{eq} = equivalent hourly average noise level; GHWTP = Graham Hill Water Treatment Plant.
Bold indicates temporary construction noise levels that exceed the noise level thresholds of 75 dBA during the evening hours of 5:00 PM to 10:00 PM, or 60 dBA during nighttime hours of 10:00 PM to 8:00 AM, as outlined in Santa Cruz County Code Section 8.30.10. Construction noise thresholds do not apply during the daytime hours of 8:00 AM to 5:00 PM, based on the Santa Cruz County Code.
[1] Average daytime ambient L_{eq} at the receiver location.

As indicated in Table 4.12-14, noise levels for Proposed Project construction stages that are anticipated to occur concurrently are predicted to generate combined construction noise levels ranging from approximately 65 to 77 dBA L_{eq} at the nearby noise-sensitive receptors surrounding the project site. Construction noise from activities performed between the hours of 8:00 AM and 5:00 PM, Monday through Friday, is not limited, based on the County Code. While the majority of the construction activities are anticipated to be performed between 8:00 AM and 5:00 PM, there would be potential work outside of these hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36(e). As described in Chapter 3, Project Description, up to 25 planned plant shutdowns are anticipated over the course of the four-year construction period to allow for required construction activities to occur. These shutdowns would vary with up to 14 shutdowns ranging between 4 and 8 hours and scheduled between 7:00 AM and 7:00 PM; and up to 11 shutdowns ranging between 8 and 24 hours in length with no restrictions on scheduled hours. Construction noise levels generated from 5:00 PM to 8:00 AM would be subject to the County Code noise limit of 75 dBA L_{eq} from 5:00 PM to 10:00 PM and a limit of 60 dBA L_{eq} from 10:00 PM to 8:00 AM, which could be exceeded, as shown in Table 4.12-14.

As part of the City's standard construction practices, which are included in the Proposed Project, the City or its contractors would be required to implement the following procedures for nighttime construction, which are described in Section 3.4.4.4 and provided below:

- **Standard Construction Practice #17 (Nighttime Construction).** For nighttime construction between the hours of 10:00 PM and 8:00 AM, notice of the dates and times nighttime tasks will be undertaken shall be provided to all residents, tenants and property owners who occupy or own property within 300 feet of the construction site at which such tasks will be performed. A Construction Noise Coordinator will be identified and the contact number for the 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. For construction in City limits, construction activities will comply with the City of Santa Cruz Municipal Code Section 9.36.

In addition to the assessment of temporary construction noise level exposures with respect to fixed noise level thresholds discussed above, construction activities are evaluated herein for purposes of disclosure to quantify their potential to increase the outdoor ambient sound levels relative to pre-construction magnitudes. This analysis is performed by comparing the modeled construction noise levels at the nearby noise-sensitive receivers to the estimated existing ambient noise levels, based on ambient noise level measurement data near the respective receivers. The ambient noise level at the receivers under existing conditions is provided in Table 4.12-14, in parentheses for each receiver location and construction stage, which range from an approximate daytime ambient of 42 to 52 dBA L_{eq}. As such, the modeled construction activities are calculated to result in increases over ambient ranging from approximately 16 dB to 34 dBA L_{eq}.

As described previously, human perception of sound levels is such that a change in sound levels of 3 dB is barely noticeable outside of a controlled setting, a change of 5 or 6 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level as it increases or decreases, respectively. Because the Proposed Project construction operations could result in an increase ranging between 16 dBA and 34 dBA over ambient at nearby receptors, temporary increases in noise from Proposed Project construction activities would likely be perceived as more than a doubling of pre-existing outdoor sound levels.

As the modeled construction noise levels would, at times (e.g., during plant shutdowns), exceed the exterior noise level standards that apply between 5:00 PM and 8:00 AM, as shown in Table 4.12-14, and as such noise levels would likely be perceived as more than a doubling of pre-existing outdoor sound levels, construction noise impacts would be potentially significant.

Implementation of MM NOI-2 would reduce predicted Proposed Project construction noise to levels below the County's applicable quantified standards and have the added benefit of reducing temporary increase in outdoor ambient noise levels during construction. MM NOI-2 features a variety of administrative/engineering controls (e.g., restricting construction hours; requiring the location of noise generating equipment as far as possible from noise-sensitive receptors) and installation of feasible and practical sound abatement, such as acoustically rated enclosures, shrouds, or temporary barriers. MM NOI-2 also provides additional specifications for how the Construction Noise Coordinator under standard construction practice #17 shall manage complaints during any nighttime construction activities. However, given the planned shutdowns of the GHWTP during construction it may not be possible to remain at or below the construction noise thresholds that apply between 5:00 PM and 8:00 AM

under all circumstances and therefore the construction noise impact of the Proposed Project would be significant and unavoidable.

Operational Noise

As indicated in Impact NOI-1, the impact of the Proposed Project related to the increase in permanent operational noise would be potentially significant. This noise impact would be reduced to less than significant with the implementation of MM NOI-1.

Mitigation Measures

Implementation of MM NOI-2 would reduce construction noise level exposures attributed to the Proposed Project as related to the relative increase above ambient noise levels. Implementation of MM NOI-2 would also reduce the potentially significant construction noise levels to the extent feasible, with respect to County fixed-level construction noise thresholds that apply between 5:00 PM and 8:00 AM per Section 8.30.10.C of the County's code. However, as described above, it may not be possible to remain at or below the construction noise thresholds under all circumstances at the GHWTP parcel between 5:00 PM and 8:00 AM and therefore the construction noise impact of the Proposed Project would be significant and unavoidable.

MM NOI-2: Construction Noise (applies to entire project site and staging areas). 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 a 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, efficient construction progress, and/or to account for prior construction delays outside of a contractor's control (e.g., weather delays).
- Construction activities requiring operations to continue outside of the hours of 8:00 AM to 5:00 PM 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 yield construction noise exposure levels that are at or below either the 60 dBA nighttime (10:00 PM to 8:00 AM) or 75 dBA daytime (5:00 PM to 10:00 PM) County code standards at the nearest offsite sensitive receptors. Noisy construction equipment, such as temporary pumps that are not submerged, aboveground conveyor systems, concrete saws, and impact tools will likely require location within such an acoustically rated enclosure, shroud, or barrier to meet these 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.
- 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 allow 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.
- In conjunction with the implementation of standard construction practice #17, the Construction Noise Coordinator shall manage complaints resulting from construction noise by instituting modifications to the construction operations, construction equipment or work plan to ensure consistency with the County Code standards that apply from 5:00 PM to 8:00 AM, where complaints are verified and substantive. Recurring disturbances shall be evaluated by a qualified acoustical consultant retained by the City to provide for consistency with applicable standards.

Impact NOI-3	Excessive Groundborne Vibration or Noise Levels (Significance Threshold C). Construction of the Proposed Project would not result in the generation of excessive groundborne vibration or 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 the analysis of groundborne vibration and noise are consistent with those discussed 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.

The Proposed Project would involve operation of on-site heavy construction equipment and processes at the GHWTP parcel that are expected to include dozers, excavators, backhoes and comparably powerful engine-driven machines and vehicles as studied in the preceding analyses for construction noise. For such conventional heavy construction equipment, FTA indicates a reference groundborne vibration level of 0.089 in/sec PPV at a reference horizontal distance of 25 feet. For an on-site roller, the anticipated piece of equipment likely to emit the highest groundborne vibration, the FTA reference data indicates 0.21 in/sec PPV at 25 feet. Since the nearest off-site receptors are located at distances greater than 25 feet from the boundary of the GHWTP facility, groundborne vibration levels propagated beneath the ground surface through local soils and rock strata would naturally attenuate to lower PPV values and thus are consistent with Caltrans-based threshold of 0.3 in/sec PPV for a receiving older residential structure. Hence, on this basis, predicted construction vibration impact would be less than significant.

Along the linear extents of the Proposed Project (i.e., the utility corridor and the alternate sanitary sewer lateral replacement area), groundborne noise and vibration sources are also anticipated to include typical heavy equipment (e.g., excavator, tractors, vibratory roller) associated with conventional open cut trenching and pipeline construction; as well as equipment associated with the linear construction and 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 less than 15 feet from the vibratory roller. Vibration generating activities associated with the conventional open cut trenching and construction methods have the potential to be included in the Proposed Project and would be performed within the roadway right-of-way and easements. As such, 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, the impact

of the Proposed Project related to the generation of groundborne noise and vibration levels associated with the linear open cut trenching construction and pipeline installation methods would be less than significant.

While open cut trenching installation methods are planned, if horizontal directional drilling (HDD) or another trenchless construction method is used, the closest sensitive receptors to the pipe breaking access points or HDD entry points are more than 50 feet from the proposed construction activities. The drill rig, hydraulic pumps and heavy equipment associated with the pipe breaking and HDD pipeline installation and construction processes 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. Therefore, the impact of the Proposed Project related to the generation of groundborne noise and vibration levels associated with trenchless pipe breaking or HDD construction methods would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to groundborne noise or vibration, and therefore, no mitigation measures are required.

4.12.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative noise impacts from 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 where relevant to this topic. The geographic area of analysis for cumulative impacts to the noise and vibration environment is limited to the immediate vicinity of the GHWTP facility, and the linear construction of the storm drain line within the utility corridor and the alternate sanitary sewer lateral replacement pipeline, and areas immediately adjacent to the routes designated for access or hauling. Therefore, only cumulative projects listed in Table 4.0-1 in the geographic area of analysis are evaluated herein.

The Proposed Project would not contribute to cumulative impacts related to exposure to aircraft noise (Significance Threshold D) as it would have no impact as described above. Therefore, this significance threshold is not further evaluated.

Impact NOI-4	Cumulative Noise and Vibration Impacts (Significance Thresholds A, B, and C). Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact related to noise; however, construction vibration would not result in significant cumulative impact. Operation of the Proposed Project would also not result in a significant cumulative impact related to noise. ***(Potentially Significant)***

Cumulative noise impacts could occur if sensitive receptors were exposed to elevated noise or vibration levels from multiple cumulative projects if operations were to occur simultaneously and in close proximity. Construction of the project is anticipated to occur over several stages, beginning in 2025 and ending in 2029. As shown in Table 4.0-1, a number of cumulative projects are located at or near the infrastructure component sites and could be under construction during this same period of time. Table 4.0-1 displays the estimated construction schedule for cumulative projects, where known.

As indicated in Impact NOI-2, construction of the Proposed Project would have the potential to generate noise levels in excess of the applicable standards that apply between 5:00 PM and 8:00 AM, such as during plant shutdowns. While the majority of the construction activities are anticipated to be performed during the hours of 8:00 AM and 5:00 PM, Monday through Friday when the construction noise thresholds do not apply, there would be potential

work outside of these hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36(e). With the implementation of MM NOI-2, the impact would be reduced but not to less than significant and therefore would remain significant and unavoidable specifically relating to temporary exceedances of the construction noise thresholds that apply between 5:00 PM and 8:00 AM.

Aside from the Proposed Project construction noise impact, construction of the Newell Creek Pipeline Improvement Project (NCP Project), and the GHWTP Concrete Tanks Project construction are in close proximity to the Proposed Project. The Concrete Tanks Project would be completed before the Proposed Project starts construction. However, there is some possibility that the construction period for the NCP Project could overlap with construction of the Proposed Project. If the southern end of the NCP Project overlaps with construction of the Proposed Project, there would be a potentially significant cumulative construction noise impact to the same sensitive receptors evaluated for the Proposed Project. If such overlap occurs, the Proposed Project would have a considerable contribution to this potentially significant cumulative construction noise impact. While MM NOI-2 would also reduce the cumulative impact, it would remain significant and unavoidable, as for the Proposed Project impact described in Impact NOI-2.

Operation of the Proposed Project would result in new facilities, equipment, and operational noise sources. New stationary equipment could generate operational noise above the applicable noise thresholds, as indicated in Impact NOI-1. Operation of the GHWTP Concrete Tanks Project would involve the operation of two new pump stations, two upgraded pump stations, a new electrical building and other new equipment on the lower building pad within the GHWTP parcel. The GHWTP Concrete Tanks Replacement Project Initial Study/Mitigated Negative Declaration indicates that the anticipated operational noise level from the structures, including additional pump stations, and electrical and other new equipment, would be similar to existing noise levels and would not be considered a significant source of additional operational noise (City of Santa Cruz 2019). It further indicates that all new motors would be fully enclosed and specifications would require the installation of quiet models. Furthermore, the pump stations would be designed to leave space for the installation of sound enclosures If they are found to be necessary. Therefore, the impact from the GHWTP Concrete Tanks Project operational noise was determined to be less than significant (City of Santa Cruz 2019). Additionally, according to City staff, based on the equipment purchased for the GHWTP Concrete Tanks Project it is not anticipated that the ambient noise levels at the project boundary would increase. However, the City will measure ambient noise levels at the project boundary after new pump station installation and install sound enclosures if they are found to be necessary to prevent an increase over existing ambient noise levels with this cumulative project. Therefore, operational noise from the Proposed Project would not combine with operational noise from the GHWTP Concrete Tanks Project and consequently these projects would not result in cumulative operational noise impacts. Additionally, because of the distance of the Proposed Project's facilities from other cumulative noise projects, and implementation of MM NOI-1 during operation, the Proposed Project would not generate noise levels that would combine to contribute to a significant cumulative noise impact. Therefore, the Proposed Project's cumulative operational noise impact would be less than significant.

As discussed in Impact NOI-3, groundborne noise and vibration are highly localized and typically remain specific to individual projects. Based on the minimal groundborne noise and vibration levels predicted to be generated by the Proposed Project, and the distant locations for potential cumulative projects, groundborne noise and vibration levels would not combine with other cumulative projects or contribute to a cumulative impact. Therefore, the Proposed Project's cumulative operational groundborne noise and vibration impact would be less than significant.

4.12.4 References

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4.13 Transportation

This section describes the existing transportation conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on review of existing County of Santa Cruz (County) and Santa Cruz County Regional Transportation Commission (SCCRTC) plans, City of Santa Cruz (City) plans, as well as other City and County studies and transportation-related documents. A traffic study was also prepared for the City to provide additional analyses to support the design of the Proposed Project (AECOM/W.M. Lyles Co. 2022). The results of that traffic study, as well as the construction analysis, are summarized in this section.

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 public comment was received from a neighboring resident related to transportation. The comment requests to allow greater pedestrian access through the existing site.

4.13.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3 in Chapter 3, Project Description.

4.13.1.1 Project Access and Roadway Network

Access to Project Site

The existing 12.4-acre GHWTP facility is located within City limits and is accessible from the south on Graham Hill Road via Ocean Street, and State Highway 1. Access from the north is provided on Graham Hill Road via Sims Road or Mt. Hermon Road off of State Highway 17. Other portions of the project site are located outside City limits within unincorporated County of Santa Cruz (County) jurisdiction. These areas include: a 0.2-acre utility corridor between the GHWTP parcel and the San Lorenzo River that is accessible from the GHWTP parcel and Ocean Street Extension; a 2.3-acre portion of the Graham Hill Road right-of-way that is accessible from this road; a 2.2-acre alternate sanitary sewer lateral replacement area that is accessible from the southwest corner of the GHWTP parcel at Ocean Street Extension and along Ocean Street Extension; and two staging areas further described below.

The two staging areas (as shown previously in Figure 3-1, Project Site and Vicinity) would be located north and south of the existing GHWTP facility. The Mt. Hermon Road staging area consists of an approximately 5.1-acre staging area located at the intersection of Graham Hill Road and Mt. Hermon Road, in the unincorporated County community of Felton. The Ocean Street Extension staging area consists of an approximately 1.9-acre staging area located at 1941 Ocean Street in the City of Santa Cruz.

Roadway Network

State Highways

State Highway 9 is a generally north-south, two-lane, 27-mile, undivided highway that connects the City with unincorporated County areas including the communities of Felton, Ben Lomond, and Boulder Creek. 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 area.

State Highway 17 is a north-south, four-lane divided highway that connects the City with unincorporated 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. Highway 17 also connects with Highway 1 within the City of Santa Cruz. Highway 17 provides regional access to the unincorporated communities within the County 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.

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.

Local Streets and Roads

While the City and County have slightly different roadway classifications for roads that traverse both jurisdictions, both are provided below for reference.

Three functional street classifications are identified in the City of Santa Cruz General Plan (2012):

- **Arterial highways and streets:** carry the heaviest traffic and provide regional and intercommunity access.
- **Collector Streets:** provide circulation within and between neighborhoods and commercial and industrial areas.
- **Local Streets:** provide direct access to abutting land uses, collectors, or arterials, and usually carry no bus routes.

Similarly, there are three functional street classifications 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.

Graham Hill Road is a two-lane north-south road that has generally 11-foot lane widths with less than 2-foot to 3-foot wide shoulders and no parking. Graham Hill Road is classified as an arterial street in the County's General Plan and is unclassified in the City's General Plan. The road extends approximately six miles from the 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 and the unincorporated County communities. 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 County Juvenile Center.

Mt. Hermon Road is a four-lane, east-west arterial street per the County's General Plan, with two travel lanes in each direction separated by an intermittent raised median. Mt. Hermon Road extends from Highway 17 in the City of Scotts Valley on the east to Graham Hill Road in the unincorporated 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.

Ocean Street south of Highway 1, near Plymouth Street, is generally a four-lane, north-south arterial street per the City's General Plan, with two travel lanes in each direction separated by an intermittent raised median. North of Highway 1, Ocean Street is an undivided, two-lane road with one travel lane in each direction. Ocean Street originates at Cliff Drive/San Lorenzo Boulevard and terminates north of Highway 1 and splits off into Graham Hill Road and the Ocean Street Extension. The Ocean Street Extension continues north into the County's jurisdiction where it is unclassified and while paved is largely unimproved with no curbs, gutters, or pedestrian amenities. The posted speed limit is 30 mph along Ocean Street north of Highway 1. There is no posted speed limit on the Ocean Street Extension.

Other Local Roads. Other local residential roads in the vicinity of the project site include Sims Road, La Madrona Road, and Zayante Road.

4.13.1.2 Other Transportation Modes

Pedestrian Facilities

No sidewalks or pedestrian paths are located in the vicinity of the project site and existing GHWTP facility. The nearest sidewalks are located on Ocean Street, south of the Graham Hill Road intersection near the Ocean Street Extension staging area. There are intermittent sidewalks located near the Mt. Hermon Road staging area along Mt. Hermon Road and Graham Hill Road. Generally, 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). Closer to the City and urban center, there are more sidewalks and pedestrian amenities available.

Improvements are proposed for Highway 9 that would provide a new sidewalk from San Lorenzo Valley (SLV) High School toward the Highway 9/Graham Hill Road intersection on the southbound side of Highway 9, which is in proximity to the Mt. Hermon Road staging area. 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 (Caltrans 2021). The project is expected to the completed in 2027.

Bicycle Facilities

The nearest bicycle facilities for the existing GHWTP facility and the Ocean Street Extension staging area are bicycle lanes on Ocean Street, south of the intersection with Graham Hill Road. There are also bicycle lanes along Mt. Hermon Road, adjacent to the Mt. Hermon Road staging area. While there are no dedicated bicycle lanes or paths along

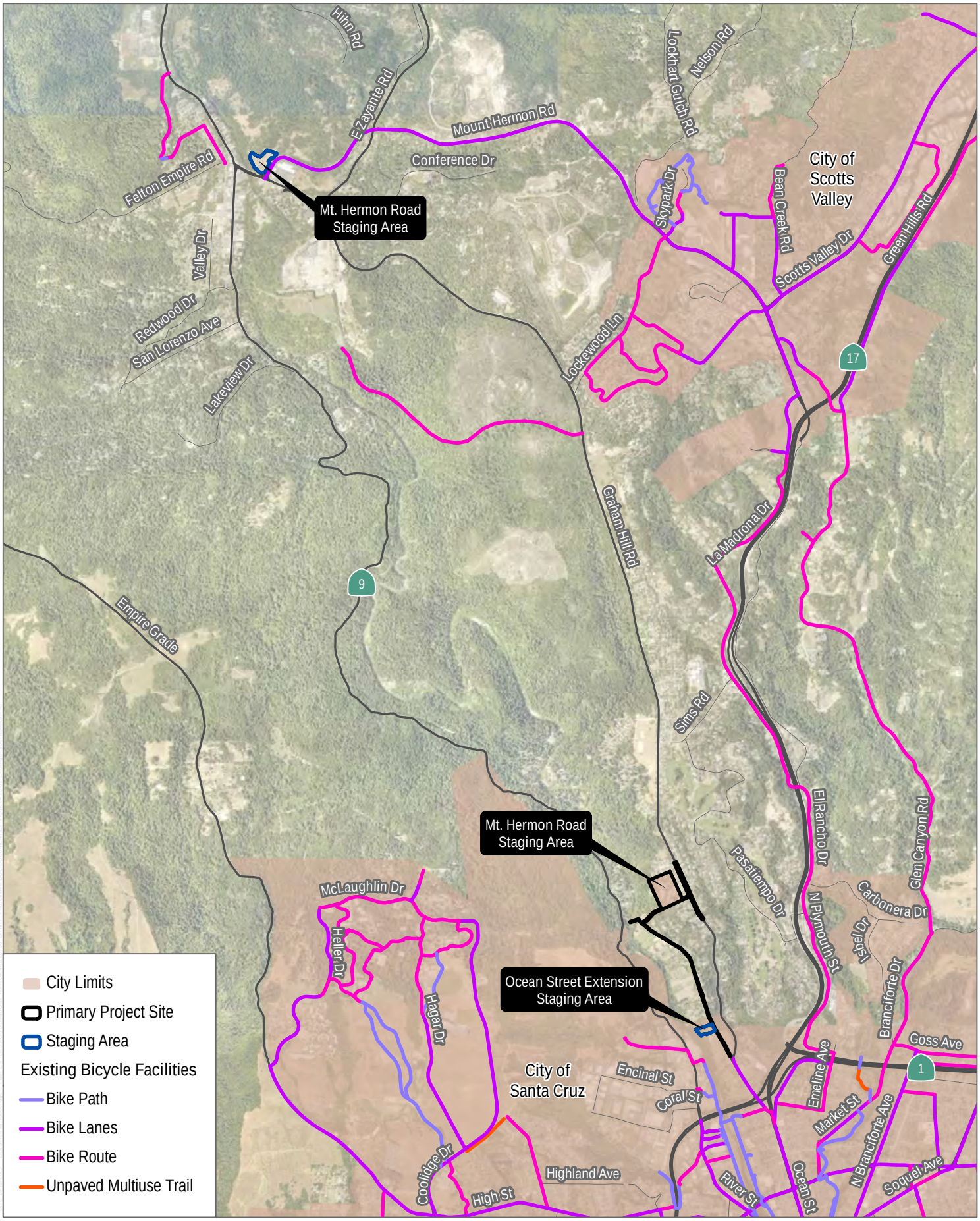
Highway 9 or local roads, the highway is regularly used by bicyclists commuting through and between town centers, cyclists accessing parks, as well as recreational cyclists, sometimes traveling the entire length of Highway 9 from Santa Clara County/Saratoga to Santa Cruz. Where shoulders exist, cyclists often use that space, but otherwise are sharing the road surface with motorists (SCCRTC et al. 2019). All existing bicycle facilities are shown in Figure 4.13-1.

Transit

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 Santa Cruz Metro Center, located approximately two miles south of the existing GHWTP facility. SCMTD Route 35E provides the nearest bus stop to the existing GHWTP facility and the Ocean Street Extension staging area is located approximately 1.2 miles south, near the intersection of Plymouth Street/Ocean Street. SCMTD Route 35E provides weekday service every 30-minutes during peak hours and operates from the Santa Cruz Metro Center along Highway 17, and connects Scotts Valley, Felton, and Ben Lomond, and terminates at the intersection of China Grade Road/Big Basin Way (SCMTD 2023). SCMTD Route 35 provides the nearest bus stop for the Mt. Hermon Road staging area, located at the intersection of Graham Hill Road/Covered Bridge Road North. SCMTD Route 35 serves the mountain communities, connecting the City of Santa Cruz to Boulder Creek via Scotts Valley. Route 35 offers 30-minute service and operates several bus stops along Mt. Hermon Road (SCMTD 2023). All transit routes are shown in Figure 4.13-2.

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 is 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. During 2022, the train services were 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 Zayante Road.



SOURCE: Bing Maps 2021, Open Street Map 2019, County of Santa Cruz 2021 and 2022

DUDEK

0 1,650 3,300 Feet

FIGURE 4.13-1

Existing Bicycle Facilities

Graham Hill Water Treatment Plant Facility Improvements Project

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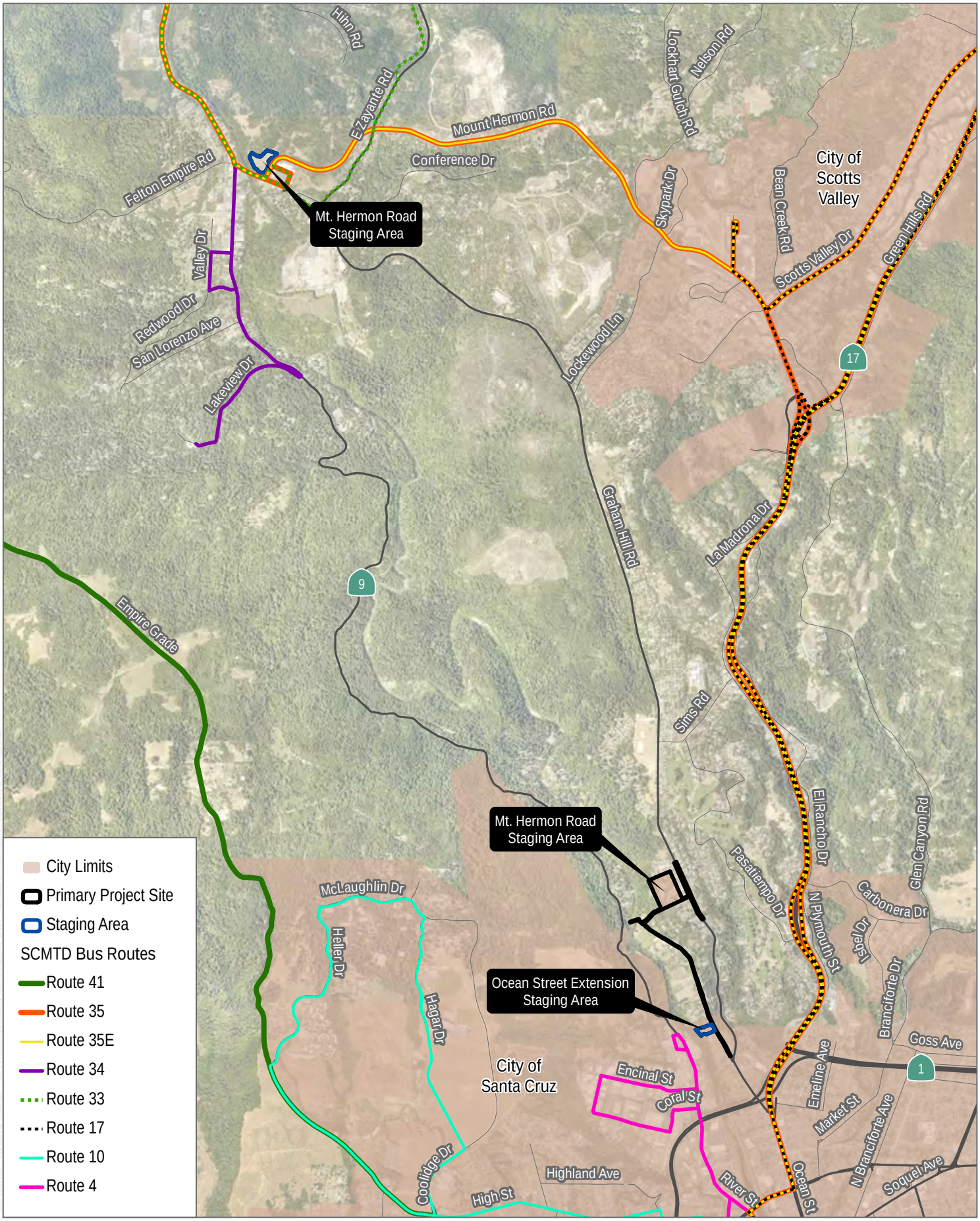

SOURCE: Bing Maps 2021, Open Street Map 2019, County of Santa Cruz 2021 and 2022

DUDEK

0 1,650 3,300 Feet

FIGURE 4.13-2

Transit Routes

Graham Hill Water Treatment Plant Facility Improvements Project

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4.13.1.3 Existing Traffic Conditions

Vehicle Traffic

Traffic count data are available for state highways and arterials within the City and County. According to the most recent available traffic count data from the California Department of Transportation (Caltrans) (Caltrans 2020, which represents 2019 counts), average daily traffic (ADT) volumes for the most-traveled segments of Highways 9 and 17 within the County were 25,500 and 76,000 vehicles, respectively (Caltrans 2020). Truck volumes on the most-traveled segments of Highways 9 and 17 within the County were 1,785 and 1,650 trucks per day, respectively (Caltrans 2020).

For roadways adjacent to the site, two locations of ADT counts were collected, north and south of the existing GHWTP facility driveway along Graham Hill Road. An 8-hour turning movement count was also collected at the intersection of the GHWTP facility driveway/Graham Hill Road between the hours of 7:30AM and 3:30 PM. The counts were collected in March 2022 during a typical weekday under normal traffic conditions. Future year data was also gathered for the year 2040 based on forecasted model volumes provided by the County, based on a linear growth rate of approximately 1.7% per year (AECOM/W.M. Lyles Co. 2022).

Table 4.13-1 shows the ADT for roadways in the project vicinity based on the data, where available.

Table 4.13-1. Roadway Annual Average Daily Traffic Volumes

Road and/or Segment	Existing (Year)
Graham Hill Road	
North of GHWTP Facility	11,405 (2022)
South of GHWTP Facility	11,477 (2022)
Highway 9	25,500 (2020)
Highway 17	76,000 (2020)

Source: Caltrans 2020 and AECOM/W.M. Lyles Co. 2022.
Note: GHWTP = Graham Hill Water Treatment Plant.

4.13.1.4 Planned Transportation System Improvements

Metropolitan Transportation Improvement Program

The Association of Monterey Bay Area Governments (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 2022 MTIP is a four-year program that covers the federal fiscal years from October 1, 2022, through September 30, 2026. The MTIP implements the 2045 Monterey Bay Area Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) adopted by the AMBAG Board of Directors in June 2022. The 2045 MTP/SCS is a financially constrained document and includes identified transportation improvement projects for the region. The planned projects along access routes to the existing GHWTP facility or construction staging areas include: pavement maintenance and replacement along a segment of Mt. Hermon Road; pedestrian improvements along Graham Hill Road and Covered Bridge Road; and bridge improvements on San Lorenzo Way near Graham Hill Road.

Regional Transportation Plan Improvements

The SCCRTC periodically completes a Regional Transportation Plan (RTP) and Regional Transportation Improvement Program according to state guidelines to guide short- and long-range transportation planning and project implementation for the County. The 2022 RTP provides guidance for transportation policy and projects through the year 2045. 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 Analyses.

- **Highway 9/San Lorenzo Valley Complete Streets Corridor Plan:** Priority projects at the southern end of the corridor could potentially overlap with the use of the Mt. Hermon Road staging area for the Proposed Project, although implementation timing has not been established. See Planned State Highway Improvements below for additional information about the planned improvements.
- **Quail Hollow Road at Zayante Creek Bridge Replacement:** 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. Access to the site would be via Graham Hill Road.
- **Highway 9 Felton Pedestrian Safety Improvements:** Construct pedestrian path on Route 9 from the SLV High School to the intersection of Graham Hill Road/Felton-Empire, plus signage and crosswalk improvements between Kirby Street and Graham Hill 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).
- **Mt. 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).
- **Sims Road Improvements:** Road rehab and maintenance from Graham Hill Road to La Madrona Drive, drainage, intersection improvements, landscaping, add bike, ped, and transit facilities.
- **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 the County Capital Improvement Program).
- **Highway 17 Access Management:** Operational improvements to existing facilities, including ramp modifications, acceleration/deceleration lanes, turning lanes, driveway consolidation, driveway channelization, etc.
- **Ocean Street Pavement Rehabilitation:** Pavement rehabilitation and bike and ped upgrades including new curb ramps, restriping of bicycle lanes and crosswalks.

Santa Cruz County Planned Improvements

The County's Final 2021–2022 Capital Improvement Program presents a five-year financing implementation plan for capital improvements within the unincorporated County. Programmed projects nearest to the project site include resurfacing of various roadways in the County such as Graham Hill Road, Sims Road, Zayante Road, and Mt. Hermon Road, the Ocean Street Extension trail southwest of the existing GHWTP facility, and the Lompico Road Bridge Replacement over Lompico Creek north of Felton.

City of Santa Cruz Planned Improvements

The City's 2022–2026 Capital Investment Project list presents a five-year financing implementation plan for capital improvements within City limits (City of Santa Cruz 2022a). Programmed projects nearest to the project site includes mainly items related to the Proposed Project and the existing GHWTP facility, and the Ocean-Plymouth Multi-modal Transportation Improvements project.

Planned State Highway Improvements

Highway 17

Highway 17 connects the City with the City of Scotts Valley, City of 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 the 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 that 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 project site 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.

4.13.2 Regulatory Framework

4.13.2.1 Federal

There are no federal regulations related to transportation that are directly applicable to the Proposed Project.

4.13.2.2 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 and 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, is no longer 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 have adopted VMT thresholds as described in Section 4.13.2.3.

4.13.2.3 Local

A number of regional and local agencies are involved with transportation planning and implementation of transportation programs and improvements within the 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/SCS, 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 the County. SCCRTC oversees planning and funding programs for local and countywide projects within the County using state and federal transportation funds.

City of Santa Cruz

SB 743 Implementation - VMT Threshold

On June 9, 2020, the Santa Cruz City Council enacted Resolution NS-29 that 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 4.13.2.2. 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 as well as local demographics based on employment and population. Finally, Transportation Demand Management strategies and VMT reduction based on the land use analyzed are available to reduce VMT impacts to less than significant.

General Plan

As required by State of California law, the City 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.
- **HZ1.2.5:** Continue to ensure that new development design and circulation allow for adequate emergency access.

Encroachment Permits

The City issues four kinds of encroachment permits, including street opening, sewer repair, temporary encroachment, and concrete. For any construction in the public right-of-way, the City requires temporary encroachment permits. These permits are required for projects when a portion of the public right-of-way is temporarily blocked or closed off for construction and staging purposes (such as construction fencing, scaffolding, signs, equipment, materials, etc.). The general requirements listed for the permit includes proof of insurance, detailed drawings of the work area, traffic control plans, and on-site inspections with City Inspector (City of Santa Cruz 2023).

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 Traffic Analysis Zone as well as local demographics based on employment and population. Finally, Transportation Demand Management 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. An update to the County's General Plan, known as the Sustainability Policy and Regulatory Update or Sustainability Update (County of Santa Cruz 2022), was approved by the County Board of Supervisors in December 2022 and is pending final certification by the California Coastal Commission. In the Sustainability Update, the existing Circulation Element is renamed as the Access + Mobility Element and has been reorganized. The element contains the following policies that relate to the Proposed Project:

- **AM-1.1.1 Vehicle Miles Traveled Impacts:** Maintain a VMT threshold that best supports statewide and regional greenhouse gas reduction goals as determined by the best available data and modeling practices.
- **AM-2.2.3 Infrastructure Safety.** Plan for and program infrastructure that promotes a safe means of travel for all users along the right-of-way, such as sidewalks, shared use paths, bicycle lanes, and paved shoulders.
- **AM-5.2.3 Limiting Traffic Volumes:** Seek to limit traffic volumes and speeds in residential neighborhoods through traffic calming measures without reducing connectivity to adjacent neighborhoods and commercial areas.
- **AM-6.1.1 Fire and Emergency Response Access.** Design adequate roadway infrastructure for fire and emergency response safety including safe access by emergency response vehicles, visible street signs, and water supplies for structural fire suppression.
- **AM-6.2.1 Level of Service (LOS) Criteria:** Require development projects to provide multimodal roadway improvements necessary to achieve a minimum level of service (LOS) of "D," except for those where a lesser LOS has been accepted by the County pursuant to the criteria specifically identified in Table 3-2 below. When development is proposed on roads where a LOS E or F standard has been accepted, require feasible mitigation in the form of road improvements, a fair share contribution to a road improvement program, or other in-lieu mitigation for the transportation system.

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 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 2023).

4.13.3 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.

4.13.3.1 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 City and County, as described in Section 4.13.2.3. 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.

4.13.3.2 Analytical Methods

The impact analyses in this section evaluate the potential for both construction-related transportation impacts and permanent operational transportation impacts. Project construction is anticipated to commence in phases over a four-year period (from approximately 2025 through 2029) while maintaining ongoing operations at the existing GHWTP facility. Construction would typically occur during normal weekday work hours, between 8:00 AM and 6:00 PM, with potential work outside of those hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36(e).

The GHWTP would continue to operate 24 hours a day, 365 days a year, as is the case under existing conditions. Operation and maintenance of the upgraded GHWTP with the Proposed Project would include many activities largely consistent with current activities. The estimated number of employees and general traffic volumes would be the same or result in a nominal increase, as further described in Impact TRA-1. Impacts have been evaluated with respect to the thresholds of significance, as described above. Additionally, City and County VMT thresholds and

implementation guidelines adopted by the City and County are also used in the determination of impact significance, as further described in Impact TRA-2. 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.

The City has identified standard construction practices (see Section 3.4.4.4, 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.

4.13.3.3 Project Impact Analysis

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 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, as described herein.

Construction

Both County and City roadways would be utilized over the course of Proposed Project construction. While the existing GHWTP facility and the Ocean Street Extension staging area are located within the City, various elements of the Proposed Project would occur within unincorporated County land. Specifically, a portion of the utility corridor and the alternate sanitary sewer replacement area are located in the County just north of the City limits, and the Mt. Hermon staging area is located within the County, in the community of Felton.

There are no known programs, plans, ordinances, or policies that address the effects of 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 near the existing GHWTP facility, and potentially along the Ocean Street Extension due to replacement or repair of the storm drain line in the utility corridor, the alternate sanitary sewer lateral replacement, and/or to facilitate truck access to the Ocean Street Extension staging area. Traffic controls would be implemented to minimize traffic delays due to construction activities, as part of the issuance of encroachment permits from the City or County. During the course of construction (from approximately 2025 through 2029), several construction phases would overlap and result in peak construction traffic. In order to evaluate the worst-case scenario for construction traffic, the overlapping peak period of construction was identified across multiple different phases of construction, and consists of the overlap between demolition, grading, linear grading, and excavation, and building construction from February 26, 2025, to April 8, 2025. All other phases of construction would be expected to have a lower number of vehicular trips. Temporary construction trips occurring over the peak construction overlapping period is summarized on Table 4.13-2 below. However, these trips would not create a measurable impact to any roadway or intersection in the area and would not conflict with the City or County's LOS policies.

Construction would typically occur during normal weekday work hours, between 8:00 AM and 6:00 PM, with potential work outside of those hours or on weekends on an as-needed basis with prior City Water Department Director approval, in accordance with City Municipal Code Chapter 9.36(e). For the purposes of this analysis, all construction workers were assumed to arrive inbound to the site during the AM peak period (7:00 AM to 9:00 AM)

and all workers were assumed to depart the site during the PM peak period (4:00 PM to 6:00 PM). All vendor trucks were assumed to arrive and depart during the AM and PM peak period. All haul trucks were assumed to arrive and depart the site equally over the course of the workday.

To account for the impact that construction-related trucks may have compared to passenger vehicles, passenger car equivalence (PCE) factors were applied to the trip generation estimates to account for truck traffic associated with construction activity. A 1.0 PCE factor was applied to passenger vehicles, 2.0 PCE for vendor trucks (which also includes trucks hauling water from off-site locations), and 3.0 for haul trucks. The trip generation estimates during the peak construction period for the Proposed Project are summarized in Table 4.13-2 below.

Table 4.13-2. Peak Day Construction Trip Generation Estimates

Vehicle Type	Daily Quantity		Daily Trips	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Non-PCE Adjusted Trip Generation									
Construction Workers[1]	82	Workers	164	82	0	82	0	82	82
Vendor Trucks[2]	12	Trucks	24	6	6	12	6	6	12
Haul Trucks[2]	12	Trucks	24	1	1	2	1	1	2
Peak Trip Total (Non-PCE)			**212**	**89**	**7**	**96**	**7**	**89**	**96**
PCE Adjusted Trip Generation									
Construction Workers	82	Workers	164	82	0	82	0	82	82
Vendor Trucks[3]	12	Trucks	48	12	12	24	12	12	24
Haul Trucks[3]	12	Trucks	72	3	3	6	3	3	6
Peak Trip Total (PCE)			**284**	**97**	**15**	**112**	**15**	**97**	**112**

Notes: PCE = passenger car equivalence.

1 Conservatively assumes all construction workers arrive in single occupant vehicles, in the AM peak hour and depart the site in the PM peak hour. However, it is more typical for construction workers to carpool given the cost of gas and limited parking at construction sites.

2 Vendor trucks are assumed to arrive and depart during the AM and PM peak period. Haul trucks are assumed to arrive and depart the site evenly throughout the workday.

3 Vendor trucks were estimated to have an approximately 2.0 PCE adjusted value, while haul trucks were estimated to have an approximately 3.0 PCE adjusted value.

As shown in Table 4.13-2, the peak period of construction for the Proposed Project would generate approximately 212 daily trips, 96 AM peak hour trips (89 inbound and 7 outbound), and 96 PM peak hour trips (7 inbound and 89 outbound). After trip generation estimates were adjusted utilizing PCE factors, the peak period of construction for the Proposed Project would generate approximately 284 daily trips, 112 AM peak hour trips (97 inbound and 15 outbound), and 112 PM peak hour trips (15 inbound and 97 outbound). For all other phases of construction, the amount of vehicular traffic is estimated to be less than the peak day. Construction would result in temporary traffic that would be eliminated from the roadway network upon completion of construction, and the Proposed Project does not include permanently widening or otherwise inducing travel on City or County roadways.

Construction would not affect bicycle or pedestrian facilities as none exist in the areas of proposed construction. The construction staging areas would be off the roadway and also would not affect the bicycle or pedestrian facilities nearby. Construction-related trips and lane closures could result in temporary delays but would not impede transit service. Further, construction of the Proposed Project would not conflict with any of the planned multimodal improvements in the area, discussed in Section 4.13.1.4. Therefore, impacts of Proposed Project construction

related to conflicts with adopted policies, plans, or programs addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities would be less than significant.

Effects of construction-related trips and lane closures on emergency access is discussed in Impact TRA-3.

Operations

Once construction of the Proposed Project is fully complete, operations at the GHWTP facility would remain the same and consist of routine inspection and maintenance by existing City staff, and any increase in daily vehicle trips would be nominal. Specifically, the upgraded GHWTP would require two new daily truck trips for additional chemical deliveries, future granular activated carbon replacement, and for hauling dewatered solids off-site. Except for planned and unplanned outages, the GHWTP would continue to operate 24 hours a day, 365 days a year, as is the case under existing conditions. Other operation and maintenance activities include monitoring and controlling the GHWTP flow, chemical feed systems, filtration process, lamella clarifiers, and equipment functions including monitoring of SCADA system and alarms; testing water samples; filter backwashing practices; sedimentation basin sludge removal; managing and handling chemical deliveries; maintaining equipment; in-kind replacement and repair of equipment and facilities; trash and recycling pick-ups; and maintaining the grounds. Some additional operations and maintenance requirements would result from new processes as described in Section 3, Project Description, however no new staff would need to be hired to perform the work. Additionally, the potential need for a signal at the GHWTP driveway/Graham Hill Road intersection was evaluated, and it was determined that a traffic signal would not be warranted, as further described in Impact TRA-3. Therefore, 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, the impact of Proposed Project operations related to conflicts with adopted policies, plans, or programs addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities would be less than significant.

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 which is greater than 15% below the regional average VMT. ***(Less than Significant)***

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), as descried herein.

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 (3)(b) 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 (3)(b) indicates that a qualitative analysis of construction traffic is often appropriate. Subdivision (4), Methodology, is related to the lead agency having discretion to choose the most appropriate methodology (i.e., travel demand model) to evaluate VMT. Since travel demand models do not analyze temporary construction traffic, Subdivision (4) would not apply to the Proposed Project.

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 a net increase of 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 110 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.

As such, a qualitative analysis of VMT is provided for the Proposed Project. Construction would result in temporary traffic, as described in Impact TRA-1, that would be eliminated from the roadway network upon completion of construction. Once construction is completed, VMT would return to pre-project conditions and all temporary, construction related VMT would be eliminated. Therefore, Proposed Project construction would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause a permanent increase in VMT that is greater than 15% below the regional average VMT, the VMT threshold adopted by both the City and County. Therefore, the construction impact of the Proposed Project related to VMT would be less than significant.

As described in Impact TRA-1, the operation of the Proposed Project would result in some additional operational and maintenance requirements, however there would be no increase in the number of total staff hired. Any increase in traffic would be nominal, as defined in Impact TRA-1, and would not directly generate substantial new VMT or conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b). Even though the Proposed Project is not a land use project, it would generate fewer than 110 daily trips and would quality as a "small project" under the City's VMT Screening Criteria and would not require further VMT analysis and its impact to VMT can be presumed to be less than significant. Additionally, the Proposed Project does not include permanently widening or otherwise inducing travel on City or County roadways. Therefore, Proposed Project operations would have nominal direct impacts related to changes in VMT and would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b) or cause a permanent increase in VMT that is greater than 15% below the regional average VMT, the VMT threshold adopted by both the City and County. Therefore, the operational impact of the Proposed Project related to VMT 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	Geometric Design (Significance Thresholds E, and F). Construction and operation of the Proposed Project would not result in substantial increases in hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses. ***(Less than Significant)***

The construction of the Proposed Project would result in a temporary increase in the number of local trips as a result of the construction workforce, including workers, vendor trucks, and haul trucks, as described in Impact TRA-1. All construction related traffic would be temporary and would be eliminated from the road network upon completion and therefore would not result hazards due to design features or incompatible uses.

The Proposed Project would not result in operation of new or upgraded roadway facilities and would not change existing roadway configurations or designs. No physical intersection improvements would be required at the Graham Hill Road and Entrance Roadway Intersection, based on a traffic study conducted for the Proposed Project (AECOM/W.M. Lyles Co. 2022). Specifically, given the low driveway vehicle volumes, the peak hour signal warrant per the California Manual of Uniform Traffic Control Devices is not met under both existing conditions and future 2040 conditions with the Proposed Project.

The GHWTP entrance driveway corner sight distance to the north of the intersection is inadequate but would be improved with vegetation removal proposed as part of the Proposed Project to meet the required design standards of 620-feet of corner sight distance. The electric pole, currently located on the right-turn slip road island of the existing GHWTP driveway, is obstructing the view of the right-turning vehicles. It is being relocated as part of a separate project, in coordination with PG&E.

Additionally, as described in Chapter 3, Project Description, traffic calming measures may be installed on Graham Hill Road and could include installing warning signs on both approaches to the Graham Hill Road and Entrance Roadway Intersection, to warn approaching drivers of the presence of the GHWTP driveway; and markings/striping of transverse strips or optical bars to encourage drivers to reduce speed. Proposed Project operations would not result in direct permanent impacts associated with hazardous design features, such as sharp curves or dangerous intersections or incompatible land uses and the impact would be less than significant.

Mitigation Measures

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

Impact TRA-4	Emergency Access (Significance Thresholds E and F). Construction and operation 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)***

Construction and operation of the Proposed Project would not result in inadequate emergency access, or substantially impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, as described herein.

The construction of the Proposed Project would result in a temporary increase in the number of local trips as a result of the construction workforce, including workers, vendor trucks, and haul trucks, as described in Impact TRA-1. The primary impacts would include short-term and intermittent delays due to lane closures at times when such lane closures are required. All construction effects would be confined to the existing GHWTP facility, the utility

corridor down to the San Lorenzo River, the alternate sanitary sewer replacement area along Ocean Street Extension, the Graham Hill Road right-of-way, and the two staging areas, and any construction effect would not significantly affect County or City roadways. 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. 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.

Where construction would take place in public roadways, encroachment permits would need to be obtained in most cases from the City or County, as relevant, for work done within the public right-of-way, as described in Section 0, 4.13.2.3 Local Regulatory Setting. The issuance of encroachment permits requires submission of traffic control plans. Implementation of these plans and requirements would include conditions to maintain access for emergency vehicles 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 and Ocean Street Extension include:

- Using temporary traffic control devices or flaggers in accordance with the Federal Highway Administration Manual on Uniform Traffic Control Devices.
- Notifying the appropriate, affected jurisdiction, emergency responders, residents, and businesses 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, detours, other points of access, 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.
- Establishing procedures for coordinating with local emergency response agencies to include dissemination of information regarding emergency response vehicle routes affected by construction activities to provide accessibility at all times in case of emergency. This may include the provision of other points of access for emergency vehicles through public and/or private properties (with access agreements in place).
- 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, and with implementation of the required traffic control plan, would not result in inadequate emergency access. Roadways would remain open, would use metal plates to provide for through access where needed, or would have detours for lane closures, and with traffic controllers and appropriate signage, emergency vehicles would have access maintained during the daily construction period when lane closures would occur. Proposed Project construction 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. Similarly, the Proposed Project would not result in inadequate emergency access, as it would not result in an increase operational traffic and vehicle trips associated with routine maintenance of facilities, or cause changes to the GHWTP access entrance, as described in Impact TRA-1 and Impact TRA-3.

The Proposed Project would not impair implementation of or interfere with an emergency evacuation plan. As described in Section 4.9, Hazards and Hazardous Materials, the Santa Cruz County Office of Response, Recovery

& Resilience serves as the emergency management office for responding to ongoing disasters. 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 Cruz Aware (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 (OR3 2023). Construction or operation of the Proposed Project would not impair implementation of such emergency evacuations, given the implementation of traffic control plans during construction, and given that the Proposed Project would not result in permanent changes to area roadways. 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

As described above, 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.

4.13.3.4 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 where relevant to this topic. The geographic area for the analysis of cumulative impacts related to transportation consists of various public roadways that would support haul truck, vendor truck, and worker vehicle access to the project site. Therefore, only cumulative projects located in immediate proximity to these public roadways are considered in the analysis herein.

Impact TRA-5	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 is anticipated to commence in phases over a four-year period (from approximately 2025 through 2029) while maintaining ongoing operations. As shown in Table 4.0-1, there are multiple cumulative projects that are located at or near the project site that could be under construction during the same period of time as the Proposed Project. Table 4.0-1 displays the estimated construction schedule for cumulative projects, where known. The cumulative projects with an overlap of construction schedules with the Proposed Project include the Santa Cruz Water Rights Project (including the intertie with the Scotts Valley Water District), River Bank Filtration Study, and Newell Creek Pipeline Improvement Project. Other cumulative projects using roads within the project vicinity would be completed before Proposed Project construction begins (Newell Creek Dam Inlet/Outlet Improvement Project and GHWTP Concrete Tanks Project) or for which construction schedules are not yet known.

Construction of the cumulative projects occurring during Proposed Project construction could result in temporary increases in daily trips due to worker, delivery, and haul trips along Graham Hill Road where the Proposed Project is located, if construction of such cumulative projects overlaps with the Proposed Project. As the construction staging areas for the Proposed Project are located at the southern and northern ends of Graham Hill Road, Proposed Project daily construction trips could be located along the entire length of Graham Hill Road and construction trips from cumulative projects could be added to this roadway, as indicated above. Additionally, the southern segment of the Newell Creek Pipeline Improvement Project would require closure of one lane during the work period along Graham Hill Road in proximity to the project site (City of Santa Cruz 2022b). Traffic controls would be implemented

for the Newell Creek Pipeline Improvement Project 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 associated with the Newell Creek Pipeline Improvement Project was analyzed to determine the impacts the construction activities would have on vehicles traveling on Graham Hill Road; with the planned lane closure there is not an hour in which the 0.5-mile closure will cause an overcapacity of the roadway which would lead to very long queues and delay times (HDR 2021). Construction of the Proposed Project and cumulative projects would result in temporary traffic and controlled lane closures on Graham Hill Road that would be eliminated from the roadway network upon completion of construction. Cumulative projects could add minimal trips related to operation and maintenance, but the Proposed Project would add nominal new operational trips, as described in Impact TRA-1, 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. Similarly, construction and operation of the Proposed Project in combination with other cumulative projects would not be expected to create hazardous roadway conditions or inadequate emergency access with the implementation of traffic control plans where needed to address work in public rights-of-way. Therefore, the cumulative impact of the Proposed Project relate to transportation would be less than significant.

4.13.4 References

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4.14 Utilities and Service Systems

This section describes the existing utilities and service system conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on project characteristics, as described in Chapter 3, Project Description, and existing conditions for the Proposed Project, as part of the preparation of this environmental impact report (EIR).

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 One public comment was received from a neighboring resident that was related to utilities and service systems. The letter requested that downhill flow connection of sewage from homes on Mosswood Court to facilitate modernization of private residences with antiquated pit type septic systems.

4.14.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel where the main facility operations occur, a utility corridor with no above ground improvements, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2 and Figure 3-3, in Chapter 3, Project Description.

4.14.1.1 Water Supply

The City provides drinking water from a variety of sources to residents of the City and surrounding areas. The areas served by the City include the City, a portion of the City of Capitola, and portions of unincorporated Santa Cruz County in Live Oak, Soquel, and along Graham Hill Road, as well as limited service along the coast north of the City,[1] primarily along State Highway 1. The City serves approximately 28,000 connections in an approximate 20-square mile area. The current population residing in the City's water service area is estimated at 98,000 people.

The City's water supply is primarily derived from surface water sources with some groundwater production in the Santa Cruz Mid-County Groundwater Basin. The City's water system is comprised of four main sources of supply: San Lorenzo River diversions; North Coast spring and creeks; Newell Creek (Loch Lomond Reservoir); and the Beltz well system. Between 2010 and 2020, the North Coast sources represented approximately 23% of the total water supply, the San Lorenzo River represented approximately 56%, Newell Creek (Loch Lomond Reservoir) represented approximately 15%, and Beltz wells contributed the remaining approximately 5% (City of Santa Cruz 2021).

The San Lorenzo River sources include the Tait Diversion adjacent to the Coast Pump Station on State Highway 9 near the City limits and the Felton Diversion, located about 6 miles upstream from the Tait Diversion. Loch Lomond Reservoir is located east of the town of Ben Lomond in the Santa Cruz Mountains and has a maximum

[1] The City's service on the coast north of the City consists of limited numbers of connections that primarily derive from the City's agreements with landowners along its water pipelines. The City also provides approximately 12 million gallons per year of raw water for agricultural irrigation along the coast north of the City.

capacity of 2.8 billion gallons. The North Coast water sources consist of surface diversions from three coastal creeks and a natural spring located approximately 6 to 8 miles northwest of downtown Santa Cruz: Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek.

The City stores water in Loch Lomond Reservoir to help meet dry-season water demand and provide back-up supply during winter storms when river diversions can be problematic due to turbidity and other water quality concerns. In general, the water supply system is managed to use available flowing sources to meet daily demands as much as possible. Groundwater and stored water from Loch Lomond Reservoir are used primarily in the summer and fall months when flows in the coast and river sources decline.

The City's adopted 2020 Urban Water Management Plan (UWMP) forecasts projected water demands at approximately 2.6 billion gallons per year in 2020 up to approximately 2.8 billion gallons per year in 2045 based on deliveries for average years, projected water demands, and available surface water flows consistent with ecosystem protection goals regarding fish habitat (City of Santa Cruz 2021). Due to the significant anticipated development of housing in the City's water service area, the City updated the long-term demand forecast in 2023. The updated forecast projected that demand in 2045 will be approximately 100 million gallons per year higher than the forecast completed for the 2020 UWMP, for an updated demand projection of 2.9 billion gallons per year in 2045 (M.Cubed 2023). Specifically, the projected increased demand is due to higher projected rates of multifamily residential and accessory dwelling unit construction.

The City's primary water supply reliability issue relates to potential shortfalls during dry and critically dry years. The UWMP predicts that projected water demand will be met for all normal and single dry water years assuming implementation of planned future water projects (e.g., water rights modifications, infrastructure projects, and aquifer storage and recovery [ASR] projects). In a multi or five-year drought similar to the 1973 to 1977 event, the estimated water supply is projected to be available to the City in the near term, 2025, during the fourth year would meet over 99% of projected demand, but during the fifth year only 73% of projected demand would be met and a projected shortfall of 608 million gallons would occur (City of Santa Cruz 2021). The analysis in the 2020 UWMP demand forecast assumes implementation of future projects such as the proposed water rights modifications, ASR, and the Proposed Project, which allows for water demands to be met further out in the future beyond the shortfalls in 2025.

The City has been pursuing possible new or supplemental water sources for the past several decades to meet demand during dry and multiple-dry year periods. The most recent strategies were developed as a result of a two-year Water Supply Advisory Committee process as explained in Section 3.2.2, Water Demand and Supply Planning Background, of this EIR. Four primary Water Supply Augmentation Strategy portfolio elements were identified that were subsequently included in the 2020 UWMP that are summarized below (City of Santa Cruz 2021):

- Additional water conservation with a goal of achieving an additional 200 to 250 million gallons per year of demand reduction by 2035 by expanding water conservation programs. An updated Water Conservation Master Plan was completed in 2016 that includes 35 implementation measures, many of which are already underway (City of Santa Cruz 2017).
- Passive recharge of regional aquifers by working to develop agreements for delivering surface water to the Soquel Creek Water District and/or the Scotts Valley Water District so they can rest their groundwater wells,[2]

[2] While Water Supply Advisory Committee recommendations considered only delivering surface water to Soquel Creek Water District and Scotts Valley Water District, current conceptual-level planning considers delivering surface water to San Lorenzo Valley Water District and Central Water District as well.

help the aquifers recover, and potentially store water for future use by the City in dry periods. The City has been piloting water transfers to the Soquel Creek Water District since 2018, as water supplies are available, under a cooperative piloting agreement that extends through 2026.

- Active recharge of regional aquifers by using existing infrastructure and potential new infrastructure in the Santa Cruz Mid-County Groundwater Basin, in the Santa Margarita Groundwater Basin in the Scotts Valley area, or in both, to store water that can be available for use by the City in dry periods. The City has been evaluating the feasibility of ASR in both the Santa Cruz Mid-County and in the Santa Margarita Groundwater Basins, with current piloting work primarily focused on the portion of Santa Cruz Mid-County Basin within the City of Santa Cruz service area.
- A potable water supply using advanced-treated recycled water as a supplemental or replacement supply in the event the groundwater storage strategies described above prove insufficient to meet the City supplemental water supply goals. In the event advanced-treated recycled water does not meet the City's needs, desalination would become the supplemental or replacement supply.

More recently, the City's Securing Our Water Future Policy (SOWF Policy), which builds on the Water Supply Advisory Committee recommendations, sets a supply reliability goal that meets all customer demand without assuming that water supply curtailments will be used as a drought management tool (City of Santa Cruz 2022). The SOWF Policy acknowledges that, due to the length of time required to develop supply augmentation projects, and the need to use an ongoing and evolving understanding of the impacts of climate change on water supply reliability, incremental implementation of augmentation projects to address the supply deficit will be required. To reduce the vulnerability to nearer term droughts, however, supply augmentation producing at least 500 million gallons a year of additional supply by 2027 should be completed (City of Santa Cruz 2022). As described in the SOWF Policy, supply augmentation sources available to achieve water supply reliability in Santa Cruz are limited to those available locally, including surface water flows from local rivers and streams during wet seasons, local groundwater resources, various forms of advanced treated recycled water, and seawater desalination.

4.14.1.2 Wastewater

Service Area

The City wastewater treatment facility (WWTF), located on California Street adjacent to Neary Lagoon, serves the cities of Santa Cruz and Capitola and parts of unincorporated Santa Cruz County. In addition to the City of Santa Cruz, the WWTF serves the Santa Cruz County Sanitation District (SCCSD) and County Service Area (CSA) 10 and CSA 57. The City also provides capacity for the City of Scotts Valley to discharge its treated wastewater into the Pacific Ocean via the City's discharge.

Treatment Plant Overview

The City owns and operates the WWTF that provides secondary level of treatment. The City treats sewage from domestic and industrial sources and discharges the treated effluent into the Pacific Ocean under the provisions of a waste discharge permit (NPDES No. CA0048194) issued by the California Regional Water Quality Control Board (RWQCB), Central Coast Region (Order No. R3-2005-0003). Monterey Bay, into which the region's treated wastewater is disposed, was designated in 1992 as a National Marine Sanctuary. Wastewater influent and effluent characteristics are carefully monitored for compliance with state water quality requirements. The City also participates in a regional receiving water monitoring program with other dischargers in the Monterey Bay area (City of Santa Cruz 2012).

The WWTF was upgraded in 1998 to provide secondary treatment in order to meet state and federal waste discharge requirements, and currently produces wastewater of a quality that would be classified as Disinfected Secondary-23. The treatment process consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection (City of Santa Cruz 2012).

The WWTF is not currently permitted for, and does not now, produce recycled water for offsite reuse. Treated wastewater is reused internally within the wastewater plant to meet its major process water needs, including chemical mixing, contact and non-contact cooling water, equipment washing, heating, and cleaning. The 1998 upgrade of the plant to provide reuse water for on-site activities reduced potable water demand at the WWTF by about 90%. It now operates using only 3 to 4 million gallons per year for sanitary, irrigation, and other miscellaneous onsite uses. The only use of recycled water outside the WWTF has been that used by the City's Public Works crews in trucks for flushing the sanitary sewer system as a way to conserve potable water. Soquel Creek Water District is currently constructing the Pure Water Soquel Project that will utilize wastewater from the WWTF, enhancing the recycled water system in the region and allowing for potential opportunities for future expansion (City of Santa Cruz 2021).

Treatment Plant Capacity

The City's WWTF is designed and permitted to treat an average dry weather flow of 17 million gallons per day (mgd) and can accommodate peak wet weather flows of up to 81 mgd. In 2019, the WWTF treated 3.3 billion gallons of wastewater influent, with an effluent discharge average of 9.04 mgd. The SCCSD has treatment capacity rights of 8 mgd at the City's WWTF. The City contributes approximately 5.0 mgd and has a remaining capacity of 4.0 mgd. The SCCSD contributes approximately 5.5 mgd with a remaining capacity of 2.5 mgd. The total remaining treatment plant capacity, therefore, is 6.5 mgd. Due to conservation measures and reduced demand in recent years, the amount of wastewater generated in the City and the SCCSD service areas has dropped substantially, averaging a total of 6.5 mgd during the dry season and totaling 2.6 billion gallons in 2020 (City of Santa Cruz 2021). Therefore, remaining WWTP capacity is likely higher than reported above.

Wastewater Collection

The City wastewater collection system serves approximately 15,000 connections. The collection system includes 23 pump stations and over 160 miles of sewer pipeline ranging in size from 6 to 54 inches in diameter. The City has a hydraulic model for the sewer system and continues to focus on collections system projects that reduce infiltration and inflow into the system (City of Santa Cruz 2012). The SCCSD provides sanitary sewer collection within its service area boundaries in unincorporated urban areas that generally extend from the eastern limits of the City to the unincorporated Aptos community to the south and does not serve the project site.

CSA No. 10 provides sanitary sewer collection within its service area boundaries and serves residential neighborhoods along Graham Hill Road, between Meyer Drive on the north and Corday Lane on the south. The service area is served by a 12-inch gravity sewer in Graham Hill Road that delivers sewage to the WWTF.

4.14.1.3 Solid Waste

Solid waste generally refers to garbage, refuse, sludge, and other discarded solid materials that come from residential, industrial, and commercial activities. Construction, demolition, and inert wastes are also classified as solid waste. The general waste classifications used for California waste management units, facilities, and disposal sites are Nonhazardous Solid Waste, Special Waste, Designated Waste, Hazardous Waste, and Industrial Waste.

Disposal of solid waste generated by the Proposed Project would likely occur at the City of Santa Cruz Resource Recovery Facility (RRF), the Dimeo Lane RRF, located approximately 3 miles west of the City off State Highway 1 at 605 Dimeo Lane.

The RRF includes a sanitary landfill, recycling center, yard waste drop-off, construction and demolition drop-off, and household hazardous waste drop-off. The RRF is permitted to receive a total of 10,484,325 cubic yards (cy) of solid waste, including construction/demolition, dead animals, green materials, industrial, inert, metals, mixed municipal, sludge (biosolids), tires, and wood waste. The facility has a maximum permitted daily solid waste throughput capacity of 535 tons, and a maximum permitted green waste throughput capacity of 12,500 cy. Based on the most recent facility capacity evaluation in May 2017, the landfill had a remaining capacity of 4,806,477 cy and an estimated closure date of January 2058 (CalRecycle 2023a). In 2020, 46,210 tons of solid waste were disposed of at the RRF (CalRecycle 2023b), which is an average of approximately 127 tons per day.

4.14.1.4 Electricity and Natural Gas

Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to the region. Central Coast Community Energy (3CE), formerly Monterey Bay Community Power, was formed in March 2017 to provide locally controlled, clean, and renewable electricity to residents and businesses in the region. Notably, the City of Santa Cruz purchases electricity from 3CE for its municipal facility operations. Section 4.6, Energy, provides additional details about these services.

4.14.1.5 Existing Infrastructure at or near the GHWTP

The existing GHWTP is served by existing potable water, wastewater collection, storm drain, electricity, natural gas, and telecommunication infrastructure that is installed at the GHWTP or elsewhere within the primary project site.

Water and Wastewater

Existing potable water lines exist at the GHWTP to serve potable water needs at the plant. Potable water for the GHWTP is provided on site by the plant and currently uses an average of approximately 108,000 gallons per day for domestic purposes and for backwashing and flushing equipment. An existing City sewer lateral conveys GHWTP sewage southward on a 4-inch line dedicated to the GHWTP within Ocean Street Extension to the City of Santa Cruz sewer main. This alignment is referred to as the alternate sanitary sewer replacement area portion of the project site. There is also an existing 12-inch gravity sewer line within the Graham Hill Road right-of-way, under the jurisdiction of CSA No. 10 that ultimately discharges to the City's collection system and is directed to the WWTF.

Storm Drain

The majority of the stormwater collected at the GHWTP combines into an existing, continuous underground storm drain system that discharges directly to the San Lorenzo River via the utility corridor portion of the project site. This storm drain line starts at the concrete tanks pad and conveys GHWTP storm water south and westward on a storm drain dedicated to the GHWTP. The existing storm drain line, constructed in 1960, is made of concrete cylindrical pipe and varies from 18 inches to 24 inches in diameter.

Electricity and Natural Gas

The facility electrical service from PG&E is brought to the existing substation at the GHWTP which includes a 21.8-kilovolt (kV), 1,200-ampere (A) breaker, and PG&E metering equipment. Before the switchgear in the electrical building, the 21.8 kV is reduced to 480 volts that feeds both the Water Quality Lab and the remainder of the GHWTP. There is also existing natural gas infrastructure at the GHWTP and both electricity and natural gas infrastructure are connected to existing services in Graham Hill Road.

Telecommunications

Telecommunications services at the GHWTP are provided by AT&T and Comcast, which provide access to infrastructure for broadband, fiber optic, wireless, and emerging technologies.

4.14.2 Regulatory Framework

4.14.2.1 Federal

Clean Water Act

The Clean Water Act (CWA) is the primary federal law that protects our nation's waters, including lakes, rivers, aquifers, and coastal areas. As defined by the U.S. Environmental Protection Agency (EPA), the CWA is the primary law regulating pollution of the nation's waterways and is intended to govern the restoration and maintenance of the chemical, physical, and biological integrity of the nation's water (EPA 2022a).

Section 303 of the CWA requires states to identify where existing pollution control technologies alone cannot meet water quality standards. Every 2 years, states are required to submit a list of impaired water bodies to the EPA, where they are prioritized based on (1) the severity of the pollution and (2) the designated use of the water (EPA 2022a).

Section 401 of the CWA requires that an applicant seeking a federal permit to conduct any activity, including the construction or operation of a facility that may result in the discharge of any pollutants, obtain certification from the state. The Section 401 certification requirement verifies compliance with existing water quality requirements or waives the certification requirement (EPA 2022b).

Section 402 of the CWA implements the National Pollutant Discharge Elimination System (NPDES).

Section 404 of the CWA established a permit program to regulate the discharge of dredged materials or fill into waters of the United States, including wetlands. Common activities regulated by Section 404 include water resource projects (e.g., dams/levees), infrastructure development (e.g., road and airports), and mining activities (EPA 2022c).

National Pollutant Discharge Elimination System

The NPDES is legislated by Section 402 of the CWA and regulated by the EPA. The permitting program prohibits the unauthorized discharge of pollutants from a point source (e.g., pipe, ditch, well) to United States waters. The permitting program addresses municipal, commercial, and industrial wastewater discharges and discharges from large animal feeding operations. Under Section 402 of the CWA, permittees must verify compliance with permit requirements by monitoring their effluent, maintaining records, and filing periodic reports. The program is administered at the local level by the RWQCBs. Under the NPDES program, the State Water Resources Control

Board (SWRCB) implements Waste Discharge Requirements for some discharges in addition to those subject to NPDES permits. Permits contain specific requirements that limit the pollutants in discharges. They also require dischargers to monitor their wastewater to support that it meets all requirements. Wastewater dischargers must maintain their treatment facilities, and treatment plant operators must be certified. The SWRCB routinely inspects treatment facilities and strictly enforce permit requirements.

Federal Energy Regulations

Section 4.6, Energy, provides federal energy regulations that are applicable to the Proposed Project.

4.14.2.2 State

Urban Water Management Planning Act

In 1983, the California State Legislature (Legislature) enacted the Urban Water Management Planning Act (California Water Code, Sections 10610–10656) that requires specified urban water suppliers within the state to prepare a UWMP and update it every 5 years. State and local agencies and the public frequently use UWMPs to determine if water supply planning has been efficiently implemented. As such, UWMPs serve as an important element in documenting water supply availability and reliability for purposes of compliance with Senate Bill (SB) 610 and SB 221, which link water supply sufficiency to large land use development project approvals. Urban water suppliers also must prepare UWMPs, pursuant to the Urban Water Management Planning Act, in order to be eligible for state funding and drought assistance.

A UWMP provides information on water usage, water supply sources, and water reliability planning within a specified water agency service area. It also may provide implementation schedules to meet projected demands over the planning horizon a description of opportunities for new development of desalinated water, groundwater information (where groundwater is identified as an existing or planned water source), a description of water quality over the planning horizon, and identification of water management tools that maximize local resources and minimize imported water supplies. Additionally, a UWMP evaluates the reliability of water supplies within the specified service area. This includes a water supply reliability assessment, a drought risk assessment, and a water shortage contingency plan.

Senate Bill 7

SB 7 (SB X7-7) was enacted in November 2009 and requires all water suppliers to increase water use efficiency. The legislation set an overall goal of reducing per capita urban water use by 20% by December 31, 2020 (California Water Code Section 10608.20). In order to reach this goal, SB X7-7 required each urban retail water supplier to report progress in meeting water use targets (California Water Code Section 10608.40). The law also required wholesale water suppliers to support their retail member agencies' efforts to comply with SB X7-7 through a combination of regionally and locally administered active and passive water conservation measures, programs, and policies, as well as the use of recycled water.

California Water Code

California's Porter-Cologne Water Quality Control Act (1969), which became Division 7 (Water Quality) of the California Water Code, establishes the responsibilities and authorities of the nine RWQCBs and the SWRCB. Among other things, it directs each regional board to formulate and adopt a water quality control plan—known as a basin plan—for all areas within the region. The basin plan defines existing and potential beneficial uses and water quality objectives for coastal waters, groundwater, surface waters, imported surface waters, and reclaimed waters in the

basin. The RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect water quality.

California Integrated Waste Management Act

AB 939, known as the California Integrated Waste Management Act of 1989, required all California cities and counties to divert 50% of the waste generated within their boundaries by the year 2000. The act requires each California city and county to prepare, adopt, and submit to the California Department of Resources Recycling and Recovery, a Source Reduction and Recycling Element (SRRE) that demonstrates how the jurisdiction will meet the California Integrated Waste Management Act's mandated diversion goals. Each jurisdiction's SRRE must include specific components, as defined in California Public Resources Code Sections 41003 and 41303. In addition, the SRRE must include a program for the management of solid waste generated in the jurisdiction consistent with the following hierarchy: (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation, and (4) land disposal.

Assembly Bill 341

Assembly Bill (AB) 341, adopted in October 2011, amended the California Integrated Waste Management Act and established a statewide policy goal to divert 75% of solid waste from landfills by 2020. AB 341 focused on mandatory commercial recycling and requires California commercial enterprises and public entities that generate 4 cy or more per week of waste to arrange for recycling services.

Assembly Bill 1826

AB 1826 (2014) requires businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate on a weekly basis. Additionally, AB 1826 requires that, after January 1, 2016, all local jurisdictions implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings with five or more units. Organic waste includes food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. This law phases in the mandatory recycling of commercial organics over time.

California Building Standards

Part 6 of Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Part 6 establishes energy efficiency standards for residential and non-residential buildings constructed in California to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy efficiency technologies and methodologies. The current Title 24 standards are the 2022 Title 24 Building Energy Efficiency Standards, which became effective January 1, 2023. Title 24 also includes Part 11, California's Green Building Standards (CALGreen). CALGreen establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The 2022 CALGreen standards are the current applicable standards. For nonresidential projects, some of the key mandatory CALGreen 2022 standards involve requirements related to bicycle parking, designated parking for clean air vehicles, electric vehicle (EV) charging stations, shade trees, water conserving plumbing fixtures and fittings, outdoor potable water use in landscaped areas, recycled water supply systems, construction waste management, excavated soil and land clearing debris, and commissioning (24 CCR Part 11).

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.

State Energy Regulations and Plans

Section 4.6, Energy, provides state energy regulations and plans that are applicable to the Proposed Project.

4.14.2.3 Local

The majority of the Proposed Project relates to production, treatment, storage, and transmission of water supplies, and therefore, as indicated above, these facilities are exempt under California Government Code Section 53091(d) and (e) from the City of Santa Cruz and County of Santa Cruz building and zoning ordinances. The Proposed Project evaluated in this EIR includes facilities dedicated to storage, treatment, and transmission of water; therefore, those facilities are exempted from City and County building and zoning ordinances. However, related facilities that serve functions other than those listed above, such as the Proposed Project's Operations and Filter Building located within City limits, remain subject to the City's zoning and building requirements. Local requirements related to wastewater discharge are typically consistent with Federal and State requirements identified in the prior section that will be implemented for the Proposed Project, where relevant.

City of Santa Cruz Municipal Code

Title 16 of the City's Municipal Code addresses water, sewers, and other public services. Title 16 chapters relevant to the Proposed Project water service and wastewater generation include:

- Chapter 16.01, Water Shortage Regulations and Restrictions
- Chapter 16.02, Water Conservation
- Chapter 16.03, Plumbing Fixture Retrofit Regulations
- Chapter 16.04, Water Services
- Chapter 16.08, Sewer System Ordinance
- Chapter 16.09, Water System Improvements
- Chapter 16.15, Water Use
- Chapter 16.16, Water-Efficient Landscaping

The City has enacted several ordinances regarding water conservation. Chapter 16.01 identifies regulations and restrictions during declared times of water shortages. Chapter 16.02 sets forth water conservation provisions to prevent the waste or unreasonable use or method of use of water. Chapter 16.16 sets forth requirements for water-efficient landscaping and also is intended to comply with the California Government Code Section 65591 et seq., the Water Conservation in Landscaping Act. The regulations are applicable to applicants for new, increased, or modified water service within the areas served by the City. On June 28, 2011, the City Council adopted Ordinance 2011-04 that amends the Municipal Code and adds a new section (16.08.065) to allow graywater use for irrigation. Graywater is wastewater that originates from showers, bathtubs, bathroom sinks, and clothes washing machines.

Chapter 16.08 ("Sewer System Ordinance") of the City's Municipal Code regulates discharge to sanitary sewer and requires that all wastewater be discharged to public sewers, with the exception of graywater as allowed by Municipal Code Chapter 16.08. Section 16.08.160 requires wastewater discharge permits for all significant users that discharge wastewater. Permit conditions include but are not limited to: city and federal limits of wastewater constituents and characteristics, limits on the rate and time of discharge, limits on the daily average and maximum discharge volumes, and requirements for installation of technology to comply with pretreatment standards or other wastewater discharge requirements compliance monitoring and schedules rates.

County of Santa Cruz Code

The Proposed Project would require a Sewer Connection Permit and Waste Discharge Permit under Chapter 7.38, Sewage Disposal, of the County Code, if the Proposed Project connects to the County sewer main in Graham Hill Road. Such a connection in Graham Hill Road is the preferred sewage disposal option that the City is pursuing (see Chapter 3, Project Description, for additional description). Per Chapter 7.38, any additions, alterations, or replacements of buildings or structures shall be consistent with all the requirements for new buildings or structures except as specifically provided in Chapter 7.38. No addition, alteration, or replacement building permit can be issued without review and approval of the Health Officer.

4.14.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of the Proposed Project related to utilities and service systems. 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 is also identified.

4.14.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to utilities and service systems 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. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects, or extend a sewer trunk line with capacity to serve new development.

B. Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years, or use water in a wasteful manner.

C. Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

D. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.

E. Not comply with federal, state, and local management and reduction statutes and regulations related to solid waste or litter control.

4.14.3.2 Analytical Methods

This section evaluates the potential impacts to utilities and service systems associated with 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 regulations, impacts would be potentially significant, and mitigation measures are provided to reduce impacts to less than significant. Additional information on how impacts were analyzed by utility/service system type is provided below.

Water Supply and Wastewater

The analyses of water supply and wastewater are based on review of the Proposed Project in light of existing water supply and wastewater infrastructure and the characteristics of the proposed improvements. The Proposed Project would include replacement of some of the existing water supply and sewer lines at the GHWTP to allow for new construction. The capacity of off-site infrastructure (e.g., capacity of wastewater treatment plant and sewer mains) is assessed, where relevant to the analysis. Continued operation of the GHWTP would not result in an increase of permanent employees. Therefore, water demand and wastewater generation associated with GHWTP staff would not be expected to increase with the Proposed Project. However, wastewater flows related to the upgraded treatment processes would increase wastewater flows by up to 200 gallons per minute (gpm) which exceeds the current capacity limitations of 150 gpm with the City's existing sewer lateral in Ocean Street Extension. Additionally, the water supply reliability provided by the Proposed Project is also considered in the determination of whether sufficient water supplies would be provided during normal, single-dry, and multiple-dry year (5-year drought) periods.

Storm Drainage

The analysis of storm drainage infrastructure is based on review of the Proposed Project in light of existing storm drainage infrastructure and the characteristics of the proposed storm drainage improvements. The Proposed Project could include replacement or rehabilitation of some or all of the existing storm drain line down to the San Lorenzo River and would include the installation of water treatment- and storage-related stormwater features on the GHWTP parcel. This section evaluates the potential environmental impacts of installing proposed new drainage infrastructure. Section 4.10, Hydrology and Water Quality, evaluates whether the Proposed Project would substantially alter the existing drainage pattern of the site or area, violate water quality standards or waste discharge requirements, or conflict with a water quality control plan.

Energy

The analyses of energy infrastructure is based on review of the Proposed Project in light of existing energy infrastructure and the characteristics of the proposed energy improvements. To support the Proposed Project, the electrical distribution system would be expanded with local distribution, as described in Chapter 3, Project Description. No additional or replacement backup generators would be required to serve the Proposed Project. Existing natural gas infrastructure at the GHWTP would be removed and replaced with electrical infrastructure as part of the Proposed Project per Santa Cruz Municipal Code Chapter 6.100.

Solid Waste

The analysis of potential solid waste impacts related to construction is based on the square footage of demolition that would occur with the Proposed Project and rates for construction and demolition debris for non-residential land uses of 3.89 pounds per square feet developed by the U.S. Environmental Protection Agency (EPA 1998). The

analysis for solid waste generation related to operations of the Proposed Project is based on a qualitative discussion in light of the assumption that no increase of permanent employees or staff would occur as well as the estimations of solids that are generated from the new solids dewatering system, described in Chapter 3, Project Description.

Application of Standard Construction Practices

The City has identified standard construction practices (see Section 3.4.4.4, Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts. However, there are no City standard construction practices applicable to utilities and service systems that are part of the Proposed Project. Standard construction practices related to other technical topics are considered throughout Chapter 4, Environmental Setting, Impacts and Mitigation Measures.

4.14.3.3 Project Impact Analysis

Impact UTL-1	New or Expanded Facilities (Significance Thresholds A and C). The Proposed Project would not result in new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities beyond those proposed as part of the Proposed Project and evaluated throughout the EIR. ***(No Impact)***

Water Supply Infrastructure

The City's GHWTP is currently served by existing potable water infrastructure and water supply lines that are installed at the GHWTP. These existing water connections are adequately sized to serve the Proposed Project due to the fact that Proposed Project operations would ultimately be relatively similar as existing conditions in the context of onsite potable water use, as there would be no additional staff required to operate and maintain the Proposed Project. The Proposed Project itself consists of water treatment facility improvements to the GHWTP, which are evaluated throughout this EIR. There are no off-site water supply improvements required to serve the Proposed Project. While some of the existing potable water infrastructure may need to be demolished and replaced to allow for construction of the proposed facility improvements at the GHWTP, the impacts of such replacement water supply infrastructure are evaluated throughout this EIR, as part of the Proposed Project. There would be no additional impacts resulting from construction of the proposed onsite water supply infrastructure that are not already addressed in other sections of this EIR. Therefore, there are no additional impacts of the Proposed Project related to new or expanded water facilities.

Wastewater Treatment

The City's WWTF is designed to treat an average dry weather flow of 17 mgd and can accommodate peak wet weather flows of up to 81 mgd. Due to conservation measures and reduced demand, the amount of wastewater generated in the City and the SCCSD service areas has dropped substantially, averaging a total of 6.5 mgd during the dry season (City of Santa Cruz 2021). The Proposed Project is estimated to increase wastewater flow by up to 200 gpm during peak conditions or 0.288 mgd due to the proposed changes in the treatment processes at the GHWTP. The Proposed Project would have no change in the amount of staffing such that there would likely be a negligible change in the amount of wastewater generation from domestic sources at the GHWTP. As such, the WWTF has remaining capacity to treat the additional flows of wastewater associated with the Proposed Project, and no new or expanded wastewater treatment facilities would be required. Therefore, there would be no impacts of the Proposed Project related to new or expanded wastewater treatment.

Sewer Improvements

The Proposed Project includes improvements to increase sewer capacity at the site to serve the additional demand from the proposed treatment system. GHWTP's existing sewer system has two, 4-inch gravity sewers serving; a) the Water Quality Lab, the existing temporary construction trailers, the lamella clarifiers, and the solids storage tank and wash water reclaim tank, and b) the existing Operations and Filter Building. These sewers combine at the lower part of the GHWTP into a dedicated 4-inch sewer lateral that conveys GHWTP sewage southward on a line within Ocean Street Extension to the City of Santa Cruz sewer main.

The existing 4-inch Ocean Street Extension sewer lateral has a capacity limited to approximately 150 gpm to service existing and proposed sewer and water treatment residuals flows. The Proposed Project is estimated to increase wastewater flow by up to 200 gpm during peak conditions where the existing capacity is currently at 150 gpm. This increased flow is solely due to the upgraded treatment processes of the solids handling system, as there would be no increase in the number of staff with the Proposed Project. The existing 4-inch sewer lateral currently serving the GHWTP would not be able to accommodate the increased peak flows in addition to the existing sanitary flows, which combined are estimated to total up to approximately 350 gpm.

As discussed in Chapter 3, Project Description, there are two options being considered to improve the sewer capacity for discharges from the GHWTP including (1) building a small sanitary lift station to connect to the County's existing 12-inch sewer line within Graham Hill Road, or (2) replacing the existing sewer line in Ocean Street Extension with one of larger capacity (6-inch sewer lateral). The EIR evaluates both options even though the City prefers the first option and discussions have commenced with the County. A sewer capacity analysis of the County owned sewer collection system in Graham Hill Road demonstrated through modeling that sufficient capacity exists to accommodate the Proposed Project flows from a new on-site sewer network, as well as existing flows from upstream of the proposed 4-inch force main connection between the GHWTP and the County's line (including Rolling Hills), and still accommodate future build-out of the County sewer service area (AECOM 2023). Therefore, a new or expanded sewer line in Graham Hill Road would not be required to serve the Proposed Project. Additionally, replacing the existing sewer line in Ocean Street Extension with one of larger capacity (6-inch sewer lateral) would not have the potential to serve new development beyond the Proposed Project, as the line is dedicated to the GHWTP and does not serve other development.

The impacts of constructing either sewer infrastructure option are evaluated throughout this EIR, as part of the Proposed Project. Sewer services would be maintained throughout construction to avoid interruption of service. There would be no additional impacts resulting from construction of these sewer infrastructure improvements that are not already addressed in other sections of this EIR. Therefore, there are no additional impacts of the Proposed Project related to new or expanded sewer facilities.

Additionally, there are no off-site sewer improvements required to serve the Proposed Project or that would be required to remedy any environmental conditions on the GHWTP parcel. A comment was received by a neighbor during the EIR scoping period and they requested downhill flow connection of sewage for homes on Mosswood Court that are on pit type septic systems to facilitate sewage disposal to mitigate any environmental concerns about these adjacent systems (see the summary of comments in Table 2-1 in Chapter 2, Introduction). However, there are no existing soil conditions on the GHWTP parcel that are due to adjacent septic systems. Therefore, no off-site sewer improvements would be required as a result of the Proposed Project and no impacts would result from such offsite sewer improvements.

Stormwater Drainage Facilities

As also described in Section 3.0, Project Description, and 4.10 Hydrology and Water Quality, the Proposed Project would include the installation of water treatment- and storage-related stormwater features on the GHWTP parcel to comply with state and local stormwater regulations, as well as potential replacement or rehabilitation of some or all of the existing storm drain line that runs from the GHWTP to the San Lorenzo River. The required drainage control features to comply with state and local stormwater regulations have been considered in Section 4.10 Hydrology and Water Quality, and other relevant sections.

Under existing conditions, the majority of the stormwater collected at the site is directed to an existing, underground drainage line that discharges directly to the San Lorenzo River. This storm drain line was constructed in 1960, made of concrete cylindrical pipe and varies from 18 inches to 24 inches in diameter. A condition assessment of the storm drain line has not been performed due to current onsite constraints, however stormwater modeling and/or a condition assessment may conclude insufficient capacity or deterioration. Therefore, this EIR assumes that replacement or rehabilitation of some or all of the storm drain line would occur under the Proposed Project. There are no off-site drainage improvements required to serve the Proposed Project.

The impacts of replacement or rehabilitation of some or all of the storm drain line down to the San Lorenzo River and the installation of water treatment- and storage-related stormwater features on the GHWTP parcel are evaluated throughout this EIR, as part of the Proposed Project. There would be no additional impacts resulting from construction of these stormwater infrastructure improvements that are not already addressed in other sections of this EIR. Therefore, there are no additional impacts of the Proposed Project related to new or expanded stormwater facilities.

Electric Power, Natural Gas, and Telecommunication Facilities

The project site is within the service areas of PG&E for electric and natural gas, and AT&T and Comcast for telecommunications. There is already existing infrastructure into the GHWTP that is sufficient to serve the Proposed Project. While the electrical distribution system within the GHWTP parcel would be expanded with local distribution to serve the Proposed Project, there is no extension of off-site infrastructure onto the GHWTP or requirement for new or expanded off-site electric services and facilities. Additionally, existing natural gas infrastructure would be removed and new and replacement telecommunication infrastructure and would be required at the GHWTP, as part of the Proposed Project. There are no off-site electric, natural gas, or telecommunications improvements required to serve the Proposed Project.

The impacts of electric and telecommunications improvements, and removal of natural gas infrastructure on the GHWTP parcel are evaluated throughout this EIR, as part of the Proposed Project. There would be no additional impacts resulting from construction of these infrastructure improvements that are not already addressed in other sections of this EIR. Therefore, there are no additional impacts of the Proposed Project related to new or expanded electric, natural gas, or telecommunications facilities.

Impact UTL-2	Water Supplies (Significance Threshold B). Operation of the Proposed Project would provide sufficient water supplies to serve the Proposed Project and would support the provision of sufficient water supplies for reasonably foreseeable future development during normal, dry, and multiple dry years. **(Beneficial)**

As discussed in Impact UTL-1, the Proposed Project would result in improvements and upgrades to the City's existing GHWTP that provides water treatment services for the City's service area. Water demands for construction would

include water for dust suppression and the demands associated with additional construction workers onsite as well as any demands for washing of construction equipment, which represent a relatively low and temporary demand. Upon completion, the demand for potable water at the GHWTP would be likely be similar to existing conditions, as no new staff would be required as a result of the Proposed Project. However, a modest increase in the use of potable water due to the upgraded treatment processes (e.g., backwashing and flushing equipment, solids dewatering facilities) would be expected from a total average potable water use of approximately 108,000 gallons per day under existing conditions, up to approximately 121,000 gallons per day. The Proposed Project would not include new residential, commercial, office or other type of development that would require additional demands for water service.

The 2020 UWMP for the City reports that forecasted water supplies would be sufficient to meet projected water demands in all normal and single dry water years out to 2045, assuming that all future water projects (e.g., water rights modifications, infrastructure projects, and ASR projects). In the near-term (2025), in a multi- or five-year drought similar to the 1973 to 1977 event, the estimated water supply is projected to be met fully for the first three years, and then the fourth year supplies would meet 99% of projected demand, while during the fifth year only 73% of projected demand would be met (City of Santa Cruz 2021). The analysis in the 2020 UWMP demand forecast assumes implementation of future water supply projects such as the proposed water rights modifications, ASR, and the Proposed Project, which allows for water demands to be met further out in the future beyond the shortfalls in 2025.

The Proposed Project would increase the facility's reliability and facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy by allowing for the improved treatment of wet season water and subsequent use. The construction and operation of the proposed water treatment facilities would provide for the reliable production of potable water under a broad range of source water conditions to support conjunctive management of surface and groundwater supplies thereby improving water supply reliability. By treating increased volumes wet season surface water during lower water demand periods, this treated water can be used for ASR or delivery to regional water agencies when available via water transfers and exchanges. These wet season waters have additional treatment requirements, due to higher turbidity and more challenging water quality conditions, which the Proposed Project would be able to treat.

Therefore, given that water demands associated with the Proposed Project would be similar to the existing GHWTP, and that the upgraded GHWTP would benefit water supply reliability by producing potable water under a broad range of source water conditions for ASR and water transfers and exchanges, the Proposed Project would support the provision of sufficient water supplies during normal, single-dry, and multiple-dry year (5-year drought) periods. Therefore, the Proposed Project's impact related to water supply would be beneficial.

Impact UTL-3	Solid Waste Generation (Significance Threshold D). Construction and operation of the Proposed Project would not generate solid waste in excess or state or local standards, or of the capacity of local infrastructure, or impair attainment of solid waste reduction goals. ***(Less than Significant)***

Construction

Construction of the Proposed Project would generate common construction waste materials (e.g., concrete rubble, asphalt rubble, wood, drywall) that would result in an increased demand for solid waste collection and disposal capacity. The demolition of the existing improvements (sedimentation basins and existing Operations and Filter Building) is estimated to produce 27.6 tons of solid waste, however some of which would be recycled in accordance with regulatory requirements. The renovation of the Operations and Filter Building would

conservatively add an additional 3.6 tons of solid waste.[3] CALGreen requires all newly constructed buildings and demolitions to develop a Construction Waste Management Plan and divert a minimum of 65% non-hazardous construction debris. SB 1374 and the California Code of Regulations Title 24 require developers to help divert waste from landfills and comply with statewide mandates. Construction and demolition materials include, but are not limited to asphalt, concrete, brick, dirt, rock, lumber, cardboard, metals and any vegetative or other land clearing/landscaping materials. With compliance with CALGreen and City requirements, the construction impacts of the Proposed Project related to solid waste would be less than significant.

Operations

Once operational, the facility would operate largely similar to existing conditions in regard to the generation of solid waste from staff as the Proposed Project would require no additional staff. However, solids generated from solids dewatering, a mechanical process of removing the higher sediment content water the Proposed Project would be able to treat, would be 2,123 cy per year for average flows and 3,680 cy per year at maximum flows.[4] Based on the most recent facility capacity evaluation in May 2017, there is a remaining capacity of 4,806,477 cy at the City RRF facility and the Proposed Project would represent a very small percentage of the available capacity. Therefore, operational impacts of the Proposed Project related to solid waste would be less than significant.

Impact UTL-4	Compliance with Solid Waste Regulations (Significance Threshold E). Construction and operation of the Proposed Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. ***(Less than Significant)***

The Proposed Project would be required to comply with applicable state and local regulations associated with the reduction of solid waste entering landfills, including the California Integrated Waste Management Act, as well as the City's plans, policies, and programs related to the recycling/diversion and the disposal of solid waste. The increase in solid waste generated from construction would be temporary and minimal compared to the daily permitted capacity at City's RRF landfill. However, compliance with City, county, and state waste reduction programs and policies, which includes diversion of any reusable construction materials, would reduce the amount of solid waste being transferred to the landfill.

Much of the non-hazardous solid waste generated from the project site once operational would be relatively similar to existing operations with no additional new staff required. However, as noted in Impact UTL-3, an estimated additional 2,123 to 3,680 cy per year of solids would be generated from the solids dewatering processing, which represents a small percentage of the daily capacity and would only occur intermittently once the solids storage tank has filled. Regardless, current practices at GHWTP of recycling (e.g., plastic and glass bottles and jars, paper, newspaper, metal containers, and cardboard) would continue, with a goal of 75%, in compliance with the Integrated Waste Management Act. Thus, the Proposed Project would comply with state and local statutes and regulations related to solid waste during construction and operation and impacts would be less than significant.

[3] The estimate for solid waste for renovation is based on the rate developed by the EPA for demolition of non-residential structures of 3.89 pounds per square foot even though renovation would likely produce less solid waste than demolition.

[4] These annual rates are based on average conditions of 11 mgd of raw water and 4.2 nephelometric turbidity units that produces an estimated 20 cy of solids during each of the 4 days of dewatering that would be necessary for the accumulated solids over the 14 days of solids storage tank filling (AECOM 2022).

4.14.3.4 Cumulative Impacts Analysis

This section provides an evaluation of cumulative utilities and service systems impacts associated with the Proposed Project and past, present, and reasonably foreseeable future projects, as identified in Table 4.0-2 in Section 4.0, Introduction to Analyses, and where relevant to this topic. The geographic area of analysis for cumulative impacts related to utilities and services is described below in each impact discussion.

The Proposed Project would not contribute to additional cumulative impacts related to the need for new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities (Significance Threshold A) beyond those proposed as part of the Proposed Project and evaluated throughout the EIR. The impacts of the infrastructure improvements included in the Proposed Project are addressed in the cumulative sections for each topic in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, of this EIR. Therefore, this significance threshold is not further evaluated herein.

Impact UTL-5	Cumulative Water and Wastewater Impacts (Significance Thresholds 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 water supply and wastewater treatment. ***(Less than Significant)***

With regard to adequacy of water supply and wastewater treatment, the geographic area considered in the cumulative analysis includes the areas served by the City for these services (Significance Thresholds B and C). Thresholds B and C address whether adequate water supplies and wastewater treatment capacity are available to serve cumulative development. The cumulative development projects included in Table 4.0-1, Chapter 4.0 are already factored into the most recent 2023 growth forecasts and water demand forecasts (M.Cubed 2023). The Proposed Project and other City water projects (e.g., ASR) are also factored into the most recent 2023 water supply forecasts that show there could be shortfalls in the near term (2025) but that supplies will be adequate in the long-term (2045). As explained in Impact UTL-2, the Proposed Project would increase the facility's reliability and facilitate implementation of the City's Water Supply Augmentation Strategy and SOWF Policy by allowing for the treatment of wet season water and subsequent use for ASR and water transfers and exchanges. Therefore, cumulative development would not result in a significant cumulative impact related to water supply availability (Significance Threshold B). Similarly, adequate wastewater treatment capacity exists to serve cumulative development, and thus, cumulative development would not result in a significant cumulative impact related to wastewater treatment capacity. Therefore, cumulative impacts related to water supply and wastewater treatment would be less than significant.

Impact UTL-6	Cumulative Landfill Impacts (Significance Thresholds D and E). 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 landfill capacity or related to compliance with solid waste regulations. ***(Less than Significant)***

The geographic area considered for the analysis of cumulative impacts related to solid waste generation and landfill capacity is Santa Cruz County. Construction and operation of past, present, and reasonably foreseeable future projects in the region (see the cumulative development projects included in Table 4.0-1, Chapter 4.0) would generate solid waste that would require disposal in area landfills. However, given regulatory requirements related to reuse and recycling, as well as remaining landfill capacities, area landfills would be expected to have adequate capacity to serve cumulative development, and cumulative impacts on landfill capacity and cumulative impacts related to compliance solid waste regulations would be less than significant.

4.14.4 References

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4.15 Wildfire

This section describes the existing wildfire conditions of the 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 Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements Project (Proposed Project). The analysis is based on a review of the existing fire environment and studies prepared for the Proposed Project. Emergency response and evacuation issues are addressed in Section 4.13, Transportation.

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. One public comment was received from a neighboring resident that related to wildfire. The letter stated that there are two levels of wildfire exposure at the GHWTP, including: direct radiant heat and ember attack from hot brands. The letter recommends the wildfire hazards be addressed with a reduced fuel zone between buildings. The comment also makes a request to include neighbors in selective vegetation thinning efforts to maintain screening and break up canopy in areas that improve sight lines.

4.15.1 Existing Conditions

The Proposed Project is comprised of the primary project site and its associated staging areas. As outlined in Section 3.1, Project Location, the primary project site is approximately 17.1 acres and consists of the GHWTP parcel, a utility corridor, the Graham Hill Road right-of-way between Mosswood Court and Lyle Way, and the alternate sanitary sewer lateral replacement area along Ocean Street Extension. The staging areas include the approximately 5.1-acre Mt. Hermon Road staging area and the approximately 1.9-acre Ocean Street Extension staging area. The primary project site and staging areas are shown on Figure 3-1, Figure 3-2, and Figure 3-3, in Chapter 3, Project Description.

4.15.1.1 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 (CAL FIRE 2018).

A wildfire is typically nonstructural fire that occurs in vegetative fuels, excluding prescribed fire that remain under control. While typically a nonstructural fire, wildfires can spread to urban areas, threatening life and property. 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.

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 on the fringes of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities. This pattern of development has implications for wildfire management, as fire risk and damage potential are elevated in the WUI due to the abundance of both fuel and ignition sources. Increased development

in 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.

4.15.1.2 Wildfire Risk

The risk of significant wildfire exists in Santa Cruz County (County). Due to local topography, fuels (forest, chaparral, grasslands) and certain weather conditions, the County is prone to periodic large wildfire events. The County identifies wildfire as a potential risk in its jurisdiction, with the greatest risks related to loss of life, loss of property, and environmental damage. Wildfire impacts to air and water quality are also a major issue that 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 subject to high-intensity storm events can result in debris flow, which can be exacerbated by infrastructure damage. Sedimentation due to winter rains on areas that burn with moderate to high severity after fire events can destroy fish habitats, which can have a catastrophic effect on the ecosystem (County of Santa Cruz 2021).

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 the wildfire risk. 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, 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.

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 Fire Hazard Severity Zones (FHSZs) (Santa Cruz County Grand Jury 2020; CAL FIRE CZU 2022). 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).

4.15.1.3 Wildfire Incidents

Each year, state, local, and volunteer fire 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 2022).

In 2008, the County experienced three large wildfires resulting in approximately 5,400 acres burned and numerous homes destroyed. In 2009, the 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 in the County, 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 2020a, 2020b).

4.15.1.4 Fire Protection

Incorporated areas within the County are 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 in conjunction with the California Department of Forestry and Fire Protection (CAL FIRE). Fire agencies have mutual aid agreements that 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).

In the case of an emergency, the closest fire station is 2.6 miles away from the Proposed Project (Santa Cruz Fire Department Station 1); however, the Proposed Project is located within the boundaries of the Scotts Valley Fire District.

4.15.1.5 Fire Hazard Severity Zone

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, where federal agencies have responsibility for wildfire protection, State Responsibility Areas, where CAL FIRE has responsibility for wildfire protection, and Local Responsibility Areas, 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.

In addition to CAL FIRE's FHSZ mapping, the County has also mapped critical and mitigatable wildfire hazard areas (also referred to as Local Responsibility Areas) due to accumulations 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 2021). Figure 4.15-1 shows CAL FIRE's FHSZs and the County's Local Responsibility Areas. Figure 4.15-2 shows fire history of the project area.

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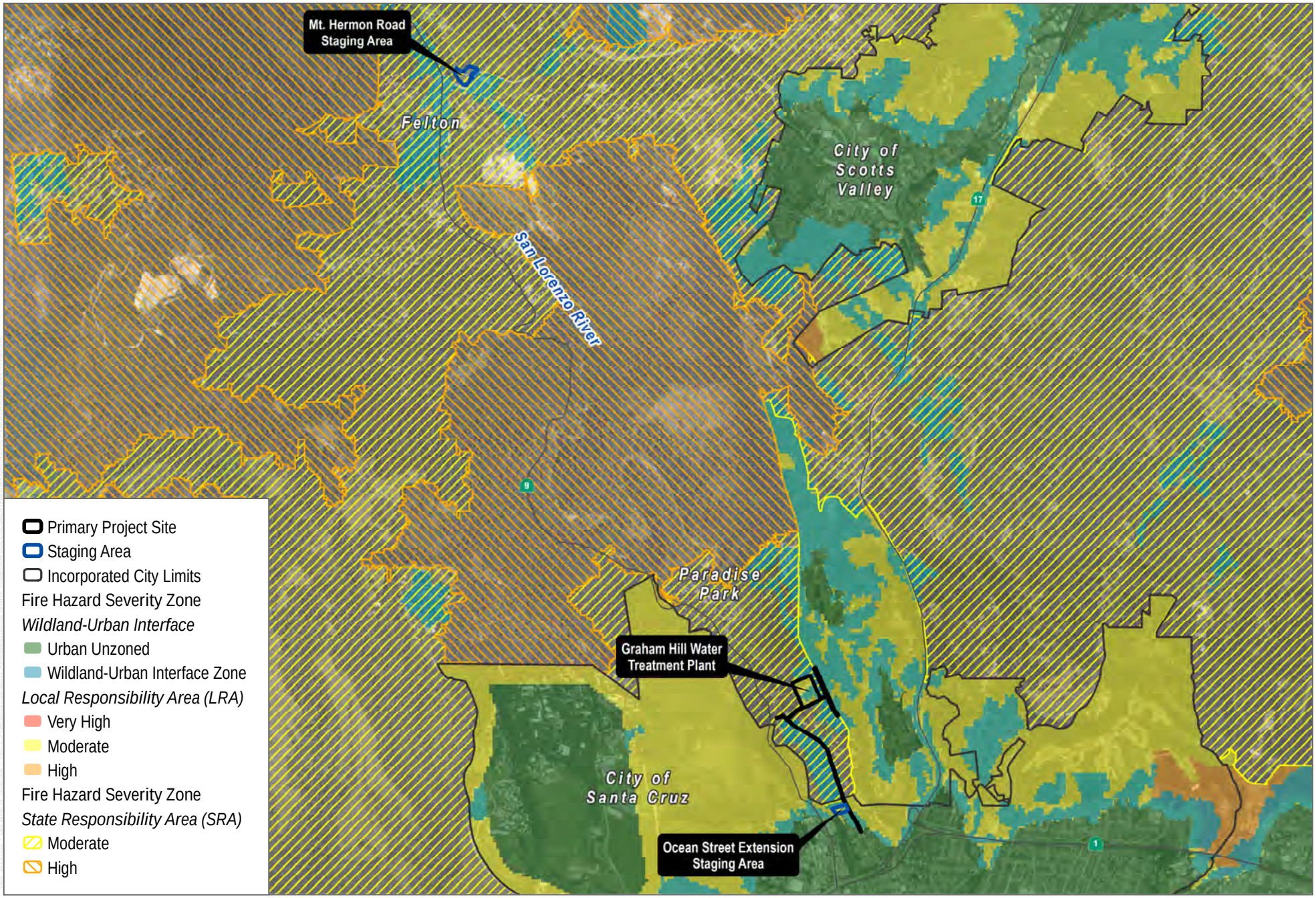

SOURCE: Bing Maps 2022, CAL FIRE 2019, Santa Cruz County 2020

DUDEK

0 2,000 4,000 Feet

FIGURE 4.15-1

Fire Hazard Severity Zones

Graham Hill Water Treatment Plant Facility Improvements Project

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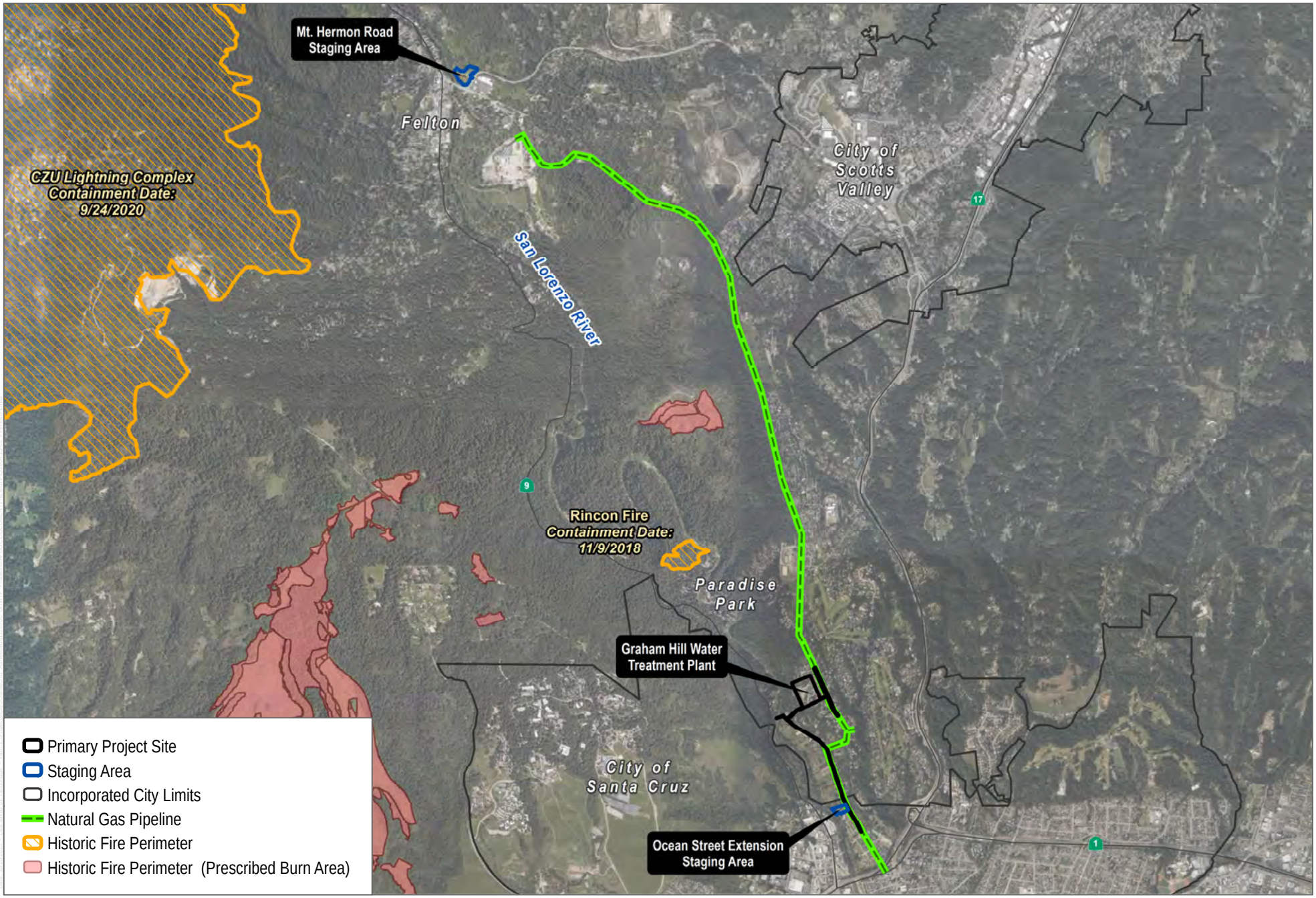

SOURCE: Bing Maps 2022, CAL FIRE 2007 & 2023, Santa Cruz County 2020

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0 2,000 4,000 Feet

FIGURE 4.15-2

Fire History

Graham Hill Water Treatment Plant Facility Improvements Project

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4.15.1.6 Wildfire Hazards in Vicinity of Proposed Project

The GHWTP parcel is located within the WUI within moderate FHSZ and approximately 2 miles from a high FHSZ (see Figure 4.15-1). The sanitary sewer lateral is within a moderate FHSZ, with the remaining portions of the primary project site located outside of moderate, high or very high FHSZs. The project staging areas on Mt. Hermon Road and Ocean Street are within a moderate, high, or very high FHSZ.

4.15.2 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 support 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 support that these safety measures are met, IFC employs a permit system based on hazard classification. The IFC is updated every three years.

4.15.2.1 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 to 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

Federal Response Plan

The Federal Response Plan of 1999, as amended in 2003 by the Federal Emergency Management Agency, 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.

4.15.2.2 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.

2022 California Fire Code

The 2022 California Fire Code (CCR Title 24, Part 9) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout California. The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas. For areas located in the WUI, projects must also follow Chapter 7A of the California Building Code. This included building construction used in exterior of buildings in WUI areas to be fire resistant construction.

4.15.2.3 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 2022 Strategic Fire Plan for the CZU in November 2022. 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 CZU.

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.

City of Santa Cruz Local Hazard Mitigation Plan

The City Local Hazard Mitigation Plan is intended to identify hazards, risk data, and prescribe goals, actions, and implementation strategies to address potential local hazards. The plan is also intended to provide demographic data and maps as well as incorporate findings from the City of Santa Cruz Climate Adaptation Plan. The plan represents the City's efforts to reduce risks from natural and other hazards, and serves as a guide for decisionmakers as they commit resources toward reducing the effects of potential hazards. The plan was last updated in October 2018.

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 2018 Santa Cruz County San Mateo County CWPP identifies the risks and hazards associated with wildland fires in the WUI areas of San Mateo and Santa Cruz counties. The CWPP, which was prepared in April 2018, also identifies recommendations aimed at preventing and reducing both infrastructure and ecosystem damage associated with wildland fires. The CWPP 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.

4.15.3 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts of the Proposed Project related to wildfire. 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.

4.15.3.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the Proposed Project related to wildfire are based on Appendix G of the CEQA Guidelines, as listed below. Discussion of adopted emergency response plans or emergency evacuation plans are discussed in Section 4.9, Hazards and Hazardous Materials and Section 4.13, Transportation. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, 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.

4.15.3.2 Analytical Methods

Impacts related to wildfire were identified based on review of the existing fire environment, technical studies prepared for the project site, and components 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 and 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.

The City has identified standard construction practices (see Section 3.4.4.4 Standard Construction Practices) that would be implemented during construction to avoid or minimize impacts related to wildfire. Standard construction practice #18 (fire suppression) applies the Proposed Project. Where applicable, this practice and its effectiveness in avoiding and minimizing impacts on wildlife are described in Section 4.15.3.3, Impact Analysis.

4.15.3.3 Project Impact Analysis

Project Impacts

Impact WIL-1	Expose People or Structures to Wildland Fire Risks (Significance Threshold A). 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 4.15.1, the GHWTP parcel is within a moderate FHSZ within a WUI and within 2 miles of a high FHSZ (see Figure 4.15-1). The remainder of the primary project site and staging areas are either within or immediately adjacent to the WUI. The WUI is the geographic area where urban development either abuts, intermingles, or intermixes with wildland vegetation. These areas are particularly vulnerable to wildfire threats due to proximity to wildland vegetation and terrain that is capable of supporting a wildfire.

The Proposed Project consists of replacing the existing water treatment processes and infrastructure facilities with upgraded and expanded facilities including an upgraded Operations and Filter Building, Maintenance Building, Ozone Building, Solids Dewatering Building, and Chemical Storage and Feed Building. Increasing the density of development within the GHWTP parcel in proximity to flammable landscape around the periphery of the parcel and beyond the parcel boundaries could increase wildfire risk to proposed structures. However, the new and replaced buildings would comply with the 2022 California Building Code and the 2022 California Fire Code (or the current editions, as applicable) that require interior sprinklers, fire resistant building materials, ember resistant vent guards or covers, fire rated exterior window, etc. Increasing the area occupied by new construction would increase impervious surfaces and decrease the area of available fuels within the more developed portions of the GHWTP. Additionally, as indicated in Chapter 3, Project Description, up to 45 trees may be removed at the GHWTP to accommodate the new and upgraded facilities. Any new tree plantings on the GHWTP parcel would be locally native, fire resistant.[1]

Construction activities would temporarily increase the number of people on the project site but after construction, the number of staff is not expected to increase over existing conditions. During construction, the Proposed Project could include the use of welding equipment, torching, generators, chainsaws, and chippers, all of which could produce sparks and potentially put construction workers, nearby residences, and wildland area at risk of fire. However, with implementation of the standard construction practice #18, fire safety measures for operating equipment would be implemented during construction; this practice is described in Section 3.4.4.4 and provided below:

- **Standard Construction Practice #18 (Fire Suppression).** 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/).

[1] New landscaping would meet the City of Santa Cruz fire-resistant landscaping requirements.

Spark arrestors would be required for internal combustion engine equipment, fire suppression equipment would be required on the project site during use of such mechanical equipment, and construction activities would not be conducted during high fire hazard periods (i.e., red flag warnings) 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 Proposed 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, and impacts related to this issue would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to risk of loss, injury or death involving wildland fires or exacerbation of wildfire risks, and therefore, no mitigation measures are required.

Impact WIL-2	Pollutant Concentrations from a Wildfire and Uncontrolled Spread of Wildfire (Significance Threshold B). The Proposed Project would not, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Proposed Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. ***(Less than Significant)***

The GHWTP parcel is located in an area zoned for Public Facilities (PF) and surrounded by residential land uses. The Proposed Project would include construction of a habitable structure on the GHWTP parcel; however, the only habitable structure would be the upgraded Operations and Filter Building due to the inclusion of a staff kitchen. Additionally given that the installation of a kitchen would not increase staffing to the Proposed Project, it would not result in an increase in human occupation at the GHWTP parcel. No other portions of the primary project site and staging areas would include the construction of habitable structures.

As previously discussed, the proposed building area on the GHWTP parcel is situated primarily on an upper building pad, which varies in elevation from 310 to 313 feet. The hill upon which the existing wash water supply tank is located at the southwest portion of the GHWTP parcel, and an unnamed slope in the southeastern portion of the site, rise to an elevation of about 330 feet. The top of the slope along the eastern perimeter of the site, bordering existing residential development, is at an elevation of 333 feet. The Concrete Tanks Project and a portion of the proposed building area is located on a lower building pad, at an elevation of 265 to 270 feet. Slopes are inclined steeper than 1:1 (horizontal: vertical) in some areas of the GHWTP parcel. Soil nail walls were recently completed behind the Concrete Tanks Project on the lower building pad and soldier pile walls have been constructed to support the access road to the lower pad (AECOM/W.M. Lyles Co. 2023).

The hilly terrain surrounding the GHWTP parcel is susceptible to localized land sliding, both seismically and non-seismically induced. Multiple landslides were previously identified on the southwestern portion of the GHWTP parcel and surrounding area. The GHWTP parcel has been graded to facilitate the construction of the existing water treatment infrastructure. Multiple small, surficial landslides within the southwestern GHWTP parcel boundary were mitigated with earthwork and infilled with riprap.

The vegetation/land cover within the undeveloped portions of the GHWTP parcel around the periphery consists of coast live oak woodland and forest, wild oats and annual brome grasslands, black cottonwood forest and woodland, and redwood forest and woodland. The remainder of the site is developed and centrally located on the GHWTP parcel.

As indicated in Impact WIL-1, up to 45 trees may be removed at the GHWTP to accommodate the new and upgraded facilities. Any new tree plantings on the GHWTP parcel would be locally native and fire resistant.

The project site's average wind speed ranges from 6 to 8 miles per hour throughout the year and from March to October comes from the west, with predominant wind direction in the other months coming from the north. However, the Proposed Project would not result in alterations to terrain or structures that would influence slopes or prevailing winds. Additionally, the Proposed Project would follow standard construction practice #18 (see Impact WIL-1) that would reduce wildfire risk during construction in all areas of the primary project site and staging areas.

Given the conditions after the construction of the Proposed Project would be essentially the same as existing conditions, the Proposed Project is not anticipated to exacerbate fire risks. After construction of the Proposed Project, the GHWTP would include most of the same structures, with the addition of facilities as listed above and in Chapter 3, Project Description. These updated and added facilities would be required to be constructed in conformance with the California Building Code (which includes the California Fire Code) that require interior sprinklers, fire resistant building materials, ember resistant vent guards or covers, fire rated exterior window, etc. Additionally, the construction and operation of other permanent Proposed Project components, including those within the utility corridor, the alternate sanitary sewer lateral replacement area, and the Graham Hill Road right-of-way would not result in permanent above ground buildings, structures, or facilities and therefore would not exacerbate wildfire risks. Therefore, the Proposed Project would not significantly increase wildfire risk and also would not expose people to risks associated with pollutant concentrations from a wildfire or the spread of an uncontrolled wildfire due to slope, prevailing winds, or other factors.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to exposure of people to risks associated with pollutant concentrations from a wildfire or the spread of an uncontrolled wildfire, and therefore, no mitigation measures are required.

Impact WIL-3	Installation or Maintenance of Infrastructure (Significance Threshold C). The Proposed Project would not 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. ***(Less than Significant)***

Construction of upgraded and new facilities for the Proposed Project would include the improvement of utilities and infrastructure at the primary project site. This includes potential replacement or upgrade to the existing underground storm drain in the utility corridor, replacement of the existing underground sewer line in the alternate sanitary sewer lateral replacement area, upgrade of the existing underground sewer systems at the GHWTP parcel, and other improvements at the GHWTP parcel including: electrical system improvements, stormwater management system improvements, new HVAC equipment in new buildings, screening/landscaping improvements, and internal road and related vehicular access improvements to existing roads. The Proposed Project would include the construction of a new liquid oxygen (LOX) tank. If this tank were to leak and interact with a fuel source, it could exacerbate wildfire risk. However, given that the area around the tank would not be vegetated, and all relevant regulations and standard measures would be put into place to ensure that the LOX tank does not leak, it would not significantly increase fire risk. Additionally, as further described in Section 4.9, Hazards and Hazardous Materials, additional standard operating procedures (SOPs) would be prepared associated with new treatment procedures, including for the LOX tank. For example, the City has prepared safety measures for hazardous materials that would be included in the Proposed Project design. These measures include safety measures for the LOX tank, SOPs for

handling of ozone and liquid oxygen, and additional safety precautions for liquid oxygen, specifically related to fire safety due to the high flammability of liquid oxygen.

Construction of all improvements would be required to be constructed in conformance with the California Building Code (which includes the California Fire Code), as described in Impact WIL-1 and Impact WIL-2. Sewer improvements and improvements to the storm drain line would be underground. Electrical system improvements would also be underground or contained within buildings in electrical cabinets designed to code; no overhead electrical lines would be installed with the Proposed Project. Additionally, existing natural gas infrastructure at the GHWTP would be removed and replaced with electrical infrastructure as part of the Proposed Project.

GHWTP facility improvements, including improvement of existing access roads internal to the GHWTP parcel would result in an overall increase in impervious surfaces on this site, as reported on in Chapter 3, Project Description. Such an increase in impervious surfaces would increase the noncombustible area on the GHWTP parcel, which would further reduce the amount of available fuels on site and associated fire risk. Additionally, as stated in Impact WIL-2, up to 45 trees may be removed at the GHWTP to accommodate the new and upgraded facilities and any new tree plantings would be locally native and fire resistant.

Construction of the Proposed Project could contribute to temporary environmental impacts; however, these impacts have been disclosed and appropriately mitigated throughout this EIR and any construction activities would be executed in accordance with the City's standard construction practices. Upon completion of construction, ongoing maintenance of the upgraded and new facilities would help reduce fire risk as emergency personnel and employees would have improved access and circulation at the site for emergency response and evacuation in the case of a fire. (See Section 4.9, Hazards, and Hazardous Materials, for additional information about emergency response and evacuation.) Therefore, the Proposed Project's wildfire risk due to installation or maintenance of associated infrastructure would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts due to installation or maintenance of infrastructure, and therefore, no mitigation measures are required.

Impact WIL-4	Runoff, Post-Fire Slope Instability or Drainage Changes (Significance Threshold D). The Proposed Project would not expose people or structures to significant risks, including downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. ***(Less than Significant)***

Although the Proposed Project does involve grading, as detailed in Section 4.7, Geology and Soils, most of the grading would take place in previously disturbed areas, making potential impacts related to slope instability minimal. As discussed in Section 4.7, Geology and Soils, the GHWTP parcel has not been identified as a potential landslide hazard area. Although the project site has some sloping and there have been mapped landslides within the southwestern portion of the GHWTP parcel, these have been previously mitigated with earthwork or infilled with riprap, minimizing the risk. Additionally, the proposed upgrade and addition to the facilities would not cause significant drainage changes, as the Proposed Project would adhere to the City's Tier 4 Mandatory Requirements in the City's Storm Water Best Management Practices Manual, which requires that peak flow discharges off-site do not exceed the pre-project runoff flowrate. For these reasons, the Proposed Project's impacts related to exposure of people or structures to significant risks, including downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes would be less than significant.

Mitigation Measures

As described above, the Proposed Project would not result in significant impacts related to exposure of people or structures to significant risks, including downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes, and therefore, no mitigation measures are required.

4.15.3.4 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 Analysis, and where relevant to this topic. The geographic area of analysis for cumulative impacts related to wildfire is generally the vicinity of the project site and therefore only cumulative projects located in the vicinity of the project site are considered in the analysis herein.

Impact WIL-5	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 Concrete Tanks Project has a construction overlap with the Proposed Project. The Newell Creek Dam Inlet/Outlet Improvement Project and the intertie pipeline with Scotts Valley would be completed before Proposed Project construction begins. Other cumulative projects would occur after completion of the Proposed Project, or are cumulative projects for which no project timeline has been established. Upon completion of the Proposed Project, the upgraded and expanded facility is not anticipated to result in significant operational hazards or exposure of 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, and thus measures described in Section 3.4.4.4, standard construction practices would apply. Cumulative projects would be expected to similarly implement these measures, which would include fire safety measures that implemented during construction at each of the sites, specifically during use of such equipment (refer to standard construction practice #18) 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. Cumulative wildfire impacts would be less than significant.

4.15.4 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 proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements 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. As described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the Proposed Project would result in the following significant unavoidable impacts that can be reduced through implementation of mitigation measures identified in Chapter 4 but not to less than significant. The significant and unavoidable impacts of the Proposed Project include:

Impact NOI-2	Substantial Temporary or Permanent Increase in Ambient Noise Levels in Excess of Applicable Standards. The Proposed Project would result in substantial noise levels in the vicinity of the project, in excess of standards established in the local general plan, noise ordinance or applicable standards of other agencies.

Impact NOI-2 related to construction noise would be significant and unavoidable related to the construction at the GHWTP parcel. Implementation of Mitigation Measure (MM) NOI-2 would reduce construction noise level exposures attributed to the Proposed Project as related to the relative increase above ambient noise levels. Implementation of MM NOI-2 would also reduce the potentially significant construction noise levels to the extent feasible, with respect to County absolute construction noise thresholds that apply during the hours of 5:00 PM to 8:00 AM per Section 8.30.10.C of the County's code. However, it may not be possible to be consistent with the absolute construction noise thresholds under all circumstances at the GHWTP parcel during the hours of 5:00 PM to 8:00 AM due to activities such as plant shutdowns and therefore the construction noise impact of the Proposed Project would be significant and unavoidable, as described in Section 4.12, Noise and Vibration.

Impact NOI-2 related to operational noise would be potentially significant but would be reduced to less than significant with the implementation of MM NOI-1, as described in Section 4.12, Noise and Vibration.

Impact NOI 4	Cumulative Noise and Vibration Impacts. Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to noise; however, construction vibration would not result in significant cumulative impact. Operation of the Proposed Project would also not result in a significant cumulative impact related to noise.

Aside from the Proposed Project construction noise impact, construction of the Newell Creek Pipeline Improvement Project (NCP Project), and the GHWTP Concrete Tanks Project construction are in close proximity to the Proposed Project. The Concrete Tanks Project would be completed before the Proposed Project starts construction. However, there is some possibility that the construction periods for the NCP Project could overlap with construction of the Proposed Project. If the southern end of the NCP Project overlaps with construction of the Proposed Project, there would be a potentially significant cumulative construction noise impact to the same sensitive receptors evaluated for the Proposed Project. If such overlap occurs, the Proposed Project would have a considerable contribution to this potentially significant cumulative construction noise impact. While MM NOI-2 would also reduce the cumulative impact, it would remain significant and unavoidable, as for the Proposed Project impact described in Impact NOI-2. See Section 4.12, Noise and Vibration, for additional information.

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 described in Chapter 3, Project Description, the Proposed Project would replace the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities. The upgrade increases the reliability of the GHWTP to meet current and anticipated future water quality requirements, improves the ability to treat variable and degraded source water quality conditions, supports treatment of wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy and Securing Our Water Future (SOWF) Policy and modernizes GHWTP to meet contemporary building, electrical, and fire code requirements. The Proposed Project would improve the ability of the GHWTP to treat contaminants of emerging concern, post-wildfire and severe stormwater quality impacts, and would provide options to respond to anticipated future regulatory requirements.

While the Proposed Project would reduce the maximum capacity of the GHWTP from 24 million gallons per day (mgd) to 18.2 mgd, the Proposed Project would increase the facility's reliability and facilitate implementation of the City's Water Supply Augmentation Strategy and Securing Our Water Future (SOWF) Policy, described in detail in Chapter 3, Project Description, by allowing for the treatment of wet season water and subsequent use. The construction and operation of the proposed water treatment facilities would increase the amount of water that can be treated and used to support conjunctive management of surface and groundwater supplies thereby improving water supply reliability. By treating increased volumes of winter or wet season surface water during lower water demand periods, this treated water can be used for aquifer storage and recovery (ASR) or delivery to regional water agencies when available via water transfers and exchanges, in support of the City's Water Supply Augmentation Strategy and SOWF Policy. These wet season waters have additional treatment requirements, due to higher turbidity and more challenging water quality conditions, which the Proposed Project would be able to treat.

Implementing passive recharge via water transfers and exchanges and active recharge via ASR requires water rights modification and the installation of facilities to allow for the transfer and exchanges of water and injection of treated water into groundwater basins in Santa Cruz County. Water rights modifications and related infrastructure components to provide for water transfers and exchanges and ASR were analyzed in the Santa Cruz Water Rights Project (SCWRP) EIR (City of Santa Cruz 2021); the growth inducement analysis from that EIR is incorporated into this EIR by reference and summarized herein.[1] Based on the results of the growth inducement analysis, the SCWRP (e.g., water rights modifications, ASR, water transfers and exchanges): (1) would not directly foster economic or population growth or construction of additional housing; (2) would not indirectly induce population growth through the expansion of public services into an area that does not currently receive these services; and (3) would not induce substantial unplanned population growth. While the SCWRP would result in an increase in available water supplies within the areas served by the City over existing conditions, these supplies would provide needed water to meet projected demand from planned population growth during times of shortfall without an overall expansion in water supplies or total permitted water rights. The proposed water rights modifications and infrastructure components for ASR and water transfers and exchanges would support the implementation of the City's Water Supply Augmentation Strategy to deliver a safe, adequate, reliable, and environmentally sustainable water supply.

[1] Pursuant to CEQA Guidelines Section 15150, the Santa Cruz Water Rights Project EIR (State Clearinghouse number 2018102039) is available for review in digital format at the Santa Cruz Public Library, Downtown Branch, 224 Church Street, Santa Cruz, California, 95060, or online at https://www.cityofsantacruz.com/home/showpublisheddocument/86973/637731697885370000.

Thus, SCWRP would provide needed supplemental water supplies during times of identified water supply shortfalls (City of Santa Cruz 2021).

Given that the Proposed Project would treat increased volumes of winter or wet season surface water for water transfers and exchanges and ASR, it would also support the provision of supplemental water supplies during times of identified water supply shortfalls and would not induce substantial unplanned population growth, as concluded for the SCWRP. Further, the Proposed Project would not directly foster economic or population growth or construction of additional housing, as it would not result in construction of new residential or commercial development and would not result in new permanent employees that would induce population growth or construction of new housing. The Proposed Project would not indirectly induce population growth through the expansion of public services into an area that does not currently receive these services. Additionally, there are no obstacles to population growth that would be removed or affected as a result of the Proposed Project.

5.4 References

City of Santa Cruz. 2021. *Santa Cruz Water Rights Project Final Environmental Impact Report* (SCH# 2018102039). November 2021.

6 Alternatives

6.1 Introduction

This chapter describes alternatives to the proposed Climate Resilient Santa Cruz: Graham Hill Water Treatment Plant (GHWTP) Facility Improvements 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 four alternatives evaluated, including the No Project Alternative. A comparison of the four 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.

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 Project Objectives

The underlying purpose of the Proposed Project is to provide for a modernized water treatment plant that: meets contemporary building, electrical, and fire code requirements; improves the ability to treat wet season water to facilitate implementation of the City of Santa Cruz's (City) Water Supply Augmentation Strategy and Securing Our Water Future (SOWF) Policy; increases the City's treatment reliability; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms and drought conditions. The objectives for the Proposed Project are as follows:

1. Provide an adaptable water treatment facility, that can readily recover from and/or adjust to changing water quality or other potentially disruptive events by using multiple process tools, operational changes, switching between supply sources, or adjusting flow rates.
2. Provide treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring total organic carbon [TOC]).
3. Provide treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for treatment of currently unregulated contaminants (e.g., contaminants of emerging concern [CECs]), provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality changes, and flow conditions.
4. Provide flexibility for installation of additional treatment equipment, if warranted, to adapt to future regulations, source water quality and flow conditions.
5. Support the implementation of the City's Water Supply Augmentation Strategy related to passive recharge of regional aquifers via water transfers and exchanges and active recharge of regional aquifers via aquifer storage and recovery (ASR) and SOWF Policy in order to deliver a safe, adequate, reliable and environmentally sustainable water supply.
6. Rehabilitate existing aging infrastructure to allow reusing and extending its useful life, to the extent feasible, or decommissioning and replacing it.
7. Provide a cost-effective project that optimizes the benefits and total cost of ownership (i.e., life cycle cost) for the City and complete construction at or below the Proposed Project budget.
8. Support the City's effort and policy to apply Health in All Policies (HiAP) approach and equity practices to City decision-making. The HiAP approach includes three pillars: sustainability, equity, and public health. The Santa Cruz Water Department goals under these pillars include:
    a. Sustainability: Support the health of the surrounding environment, implement environmentally superior building materials and designs, reduce energy and water use in municipal buildings, reduce greenhouse gas emissions, and support the development of renewable energy sources.
    b. Equity: Create and foster maximum organizational effectiveness, such as providing responsible financial stewardship, and identifying and engaging a diverse set of potential stakeholders.
    c. Public Health: Preserve and secure reliable water supplies, considering future impacts of climate change and natural hazards to water service reliability and meeting current and foreseeable drinking water standards.

9. Throughout the construction process, maintain production of potable water delivery throughout the City distribution system, without incurring emergency plant shutdowns, permit violations, or exceedances of drinking water standards, due to construction activities.
10. Provide a water treatment facility that meets current seismic, building, fire, and electrical codes; protects buildings in the wildland urban interface, as warranted; and meets California Division of Drinking Water (DDW) permitting requirements.

The ability of each alternative evaluated in detail to meet these project objectives is evaluated in Section 6.5, Alternatives Selected for Analysis in the EIR, and in Table 6-1.

6.3 Project Impact Summary

The range of alternatives studied in the EIR must be broad enough to permit a reasoned choice by decision-makers when considering the merits of the project. The analysis should focus on alternatives that are potentially feasible. Under CEQA, alternatives that are remote or speculative should not be discussed in the analysis of alternative. Furthermore, alternatives should focus on reducing or avoiding significant environmental impacts associated with the project as proposed.

This section provides a summary of the proposed project impacts and emphasizes topics for which one or more impacts were determined to be potentially significant or significant. A summary of the significant and unavoidable impacts of the Proposed Project is also provided below. A comparative analysis of each alternative evaluated in detail in Section 6.5, is provided to determine whether the alternative would reduce the potentially significant or the significant and unavoidable impacts of the Proposed Project (see also Table 6-2).

6.3.1 Summary of Project Impacts

Biological Resources

As described in Section 4.4, Biological Resources (Chapter 4, Environmental Setting, Impacts, and Mitigation Measures), Proposed Project impacts related to special-status wildlife species and protected wetlands or waters would be potentially significant but would be reduced to less than significant with the implementation of mitigation (Mitigation Measure [MM] BIO-1, MM BIO-2, MM BIO-3, MM BIO-4, and MM BIO-5) (see Impact BIO- 1 and Impact BIO-3). Project impacts related to riparian habitat, sensitive natural communities, wildlife nursery sites, and fish or wildlife habitat and populations would be less than significant (see Impact BIO-2, Impact BIO-4, and Impact BIO-5). The Proposed Project would result in no impacts related to wildlife movement or corridors, conflicts with adopted policies or regulations, or conflicts with an adopted habitat conservation plan. Cumulative biological resource impacts would be less than significant (Impact BIO-6).

Geology and Soils

As described in Section 4.7, Geology and Soils, Proposed Project impacts related to seismic hazards, landslides, unstable geologic unit or soils, and expansive soils would be less than significant (see Impact GEO-1, Impact GEO-2, Impact GEO-3, and Impact GEO-4). Proposed Project impacts related to paleontological resources would be potentially significant but would be reduced to less than significant with the implementation of mitigation (MM GEO-1) (see Impact GEO-5). Cumulative impacts related to geology and soils would be less than significant (Impact GEO-6 and Impact GEO-7).

Hazards and Hazardous Materials

As described in Section 4.9, Hazards and Hazardous Materials, Proposed Project impacts related to the routine transport, use, or disposal of hazardous materials associated with hazardous building materials and impacted soils would be potentially significant but would be reduced to less than significant with the implementation of mitigation (MM HAZ-1) (see Impact HAZ-1). Proposed Project impacts related to reasonably foreseeable upset or accident conditions and interference with emergency response plans would be less than significant (see Impact HAZ-2 and Impact HAZ-3). Cumulative hazards impacts related to hazards and hazardous materials would also be less than significant (Impact HAZ-4).

Noise and Vibration

As described in Section 4.12, Noise, Proposed Project impacts related to a permanent increase in ambient noise from operation of the Proposed Project would be potentially significant but would be reduced to less than significant with the implementation of mitigation (MM NOI-1) (see Impact NOI-1). Proposed Project impacts related to construction vibration and groundborne noise would be less than significant (see Impact NOI-3). Proposed Project impacts related to temporary increases in ambient noise levels in excess of applicable standards during construction would be reduced with the implementation of mitigation (MM NOI-2), but it may not be possible to be consistent with the absolute construction noise thresholds under all circumstances at the GHWTP parcel and therefore the construction noise impact of the Proposed Project would be significant and unavoidable (see Impact NOI-2). Similarly, the cumulative construction noise impact would also be significant and unavoidable if the southern end of the Newell Creek Pipeline (NCP) Project overlaps with construction of the Proposed Project (see Impact NOI-4), even with implementation of MM NOI-2.

Utilities and Service Systems

As described in Section 4.14, Utilities and Service Systems, the Proposed Project would result in no additional impacts related to new or expanded facilities beyond those evaluated as part of the Proposed Project (see Impact UTL-1). The Proposed Project impact related to water supply would be beneficial (see Impact UTL-2). Proposed Project impacts related to solid waste generation and compliance with solid waste regulations would be less than significant (see Impact UTL-3 and Impact UTL-4). Cumulative utilities and service systems impacts would also be less than significant (Impact UTL-5 and Impact UTL-6).

Other Impacts

All other impacts of the Proposed Project related to aesthetics (Section 4.2), air quality (Section 4.3), cultural and tribal cultural resources (Section 4.5), energy (Section 4.6), greenhouse gas emissions (Section 4.8), hydrology and water quality (Section 4.10), land use and planning (Section 4.11), transportation (Section 4.13), and wildfire (Section 4.15) would be less than significant, as described in Chapter 4.

6.3.2 Significant and Unavoidable Impacts

As described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, and listed above the Proposed Project would result in the following significant and unavoidable impacts that can be reduced through

implementation of mitigation measures identified in Chapter 4 but not to less than significant. The significant and unavoidable impacts of the Proposed Project include:

Impact NOI-2	Substantial Temporary or Permanent Increase in Ambient Noise Levels in Excess of Applicable Standards. The Proposed Project would result in substantial noise levels in the vicinity of the project, in excess of standards established in the local general plan, noise ordinance or applicable standards of other agencies.

Impact NOI-2 related to temporary increases in ambient noise levels during construction and permanent increases in ambient noise levels during operations would be potentially significant. Implementation of MM NOI-1 related to operational mechanical and process noise would avoid substantial permanent increases in noise levels through project design and the impact would be reduced to less than significant. However, construction noise would be significant and unavoidable related to the construction at the GHWTP parcel. Implementation of MM NOI-2 would reduce construction noise level exposures attributed to the Proposed Project as related to the relative increase above ambient noise levels. Implementation of MM NOI-2 would also reduce the potentially significant construction noise levels to the extent feasible, with respect to County absolute construction noise thresholds that apply during the hours of 5:00 PM to 8:00 AM per Section 8.30.10.C of the County's code. However, it may not be possible to be consistent with the absolute construction noise thresholds under all circumstances at the GHWTP parcel during the hours of 5:00 PM to 8:00 AM due to activities such as plant shutdowns and therefore the construction noise impact of the Proposed Project would be significant and unavoidable.

Impact NOI-2 related to operational noise would be potentially significant but would be reduced to less than significant with the implementation of MM NOI-1, as described in Section 4.12, Noise and Vibration.

Impact NOI-4	Cumulative Noise and Vibration Impacts. Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, would result in a significant cumulative impact related to noise; however, construction vibration would not result in significant cumulative impact. Operation of the Proposed Project would also not result in a significant cumulative impact related to noise.

Aside from the Proposed Project construction noise impact, construction of the NCP Project, and the GHWTP Concrete Tanks Project construction are in close proximity to the Proposed Project. The Concrete Tanks Project would be completed before the Proposed Project starts construction. However, there is some possibility that the construction period for the NCP Project could overlap with construction of the Proposed Project. If the southern end of the NCP Project overlaps with construction of the Proposed Project, there would be a potentially significant cumulative construction noise impact to the same sensitive receptors evaluated for the Proposed Project. If such overlap occurs, the Proposed Project would have a considerable contribution to this potentially significant cumulative construction noise impact. While MM NOI-2 would also reduce the cumulative impact, it would remain significant and unavoidable, as for the Proposed Project impact described in Impact NOI-2. See Section 4.12, Noise and Vibration, for additional information.

6.4 Alternatives Considered but Eliminated

This section discusses alternatives that were considered but were eliminated from detailed consideration because they did not meet most of the basic project objectives; were found to be infeasible for technical, environmental, or social reasons; or they did not avoid or substantially lessen significant environmental impacts of the Proposed

Project. Section 15126.6(c) of the CEQA Guidelines indicates that the range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible, 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 (see introduction to this chapter), or (3) inability to avoid significant environmental impacts.

As a result of the City's ongoing water supply planning process and specific planning and design process for the Proposed Project, the following alternatives were reviewed but eliminated from further consideration as alternatives to the Proposed Project, as explained below:

1. Centralized and Distributed Membrane Treatment Plant(s)
2. New Treatment Plant to Replace the GHWTP
3. Alternative Site Plan Layouts

6.4.1 Centralized and Distributed Membrane Treatment Plant(s)

During the City's early planning for the Proposed Project, several treatment options were reviewed and evaluated. Among them were a centralized membrane treatment plant alternative at the GHWTP, and a distributed membrane treatment plant alternative at multiple locations, with a main membrane treatment plant at the GHWTP. Membrane treatment plants involve the use of ultrafiltration membrane filtration (UF) to remove suspended solids, bacteria, etc. in raw water. The centralized and distributed membrane treatment options are further described herein.

6.4.1.1 Centralized Membrane Treatment Plant

The centralized membrane treatment plant alternative at the GHWTP would be sized with a similar capacity as the Proposed Project (approximately 18 million gallons per day [mgd]). Some of the same treatment components would be incorporated into this alternative, as with the Proposed Project (e.g., new pre-treatment process with plate settlers); however, UF membranes would be also used and housed in a new two-story Membrane Building and the existing filters at the GHWTP would be converted to future granular activated carbon (GAC) contactors or a similar technology. Overall, this alternative would have a similar treatment capability as the Proposed Project, similar environmental impacts, but would be much more expensive than the Proposed Project. Given that this alternative would not avoid significant environmental impacts of the Proposed Project, and would not meet one of the key project objectives related to obtaining a cost-effective project that optimizes the benefits and total cost of ownership for the City and as a result may be infeasible, this alternative was eliminated from further consideration.

6.4.1.2 Distributed Membrane Treatment Plants

The distributed membrane treatment alternative would also be sized with a similar capacity as the Proposed Project, but would have several smaller capacity water treatment plants distributed throughout the City with a combined capacity of approximately 4 mgd with a main membrane water treatment plant at the existing GHWTP with a capacity of approximately 14 mgd. City-owned properties were considered for the smaller capacity plants including the Bay Street Reservoir, located west of Bay Street on Cardiff Place; University Pump Station #2, located on Bay Street; Tait Wells located along the eastern side of the San Lorenzo River off of Ocean Street Extension; and the Coast

Pump Station and adjacent vacant City property located on the western side of the San Lorenzo River off of Highway 9. These sites are relatively small, would require extensive site improvements, and/or are located in the San Lorenzo River floodplain, and are not well suited for a distributed membrane treatment system. Additionally, this alternative would not avoid significant environmental impacts of the Proposed Project, as the City-owned properties are located in residential neighborhoods and would have similar environmental impacts, as compared to the Proposed Project. Lastly, this alternative would not meet one of the key project objectives related to obtaining a cost-effective project that optimizes the benefits and total cost of ownership for the City and as a result may be infeasible. Therefore, this alternative was eliminated from further consideration.

6.4.2 New Treatment Plant to Replace the GHWTP

The City did not consider in detail replacement of the existing GHWTP with a new treatment plant, located on another site for a number of reasons. The GHWTP is long-established in its present location and is serving its intended purpose. While it requires rehabilitation of aging infrastructure and upgrades to meet treatment challenges, abandoning the facility for a new plant someplace else would not meet key project objectives related to reusing and extending the useful life of existing infrastructure and obtaining a cost-effective project that optimizes the benefits and total cost of ownership for the City. Further, the City does not own any other land that would be suitable from a hydraulic perspective and adequate in size for such a new replacement plant. The purchase of property for a new plant, was also not considered, as such an option was considered potentially financially infeasible and would not fulfill most of the basic project objectives summarized above. Lastly, the construction of a new replacement plant on another site has the potential to result in greater environmental impacts, as compared to the Proposed Project. Therefore, this alternative was eliminated from further consideration.

6.4.3 Alternative Site Plan Layouts

While designing the Proposed Project, the City considered a number of alternative site plan layouts to accommodate the proposed facilities at the GHWTP. These alternatives explored different configurations for the proposed facilities. However, these alternatives are not dramatically different from one another. The various site plan layouts would not reduce or otherwise substantially lessen any of the significant effects of the Proposed Project, as these plans would accommodate the same components as the Proposed Project. Therefore, alternative site plan layouts were eliminated from further consideration.

6.5 Alternatives Selected for Analysis in the 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 6.4, 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, as listed in Section 6.3, Overview of Significant Project Impacts, and described in detail in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. As most identified impacts of the Proposed Project relate to the actual construction of various project and programmatic infrastructure components, the alternatives selected consider alternate or reduced infrastructure components.

The following four alternatives were selected for comparative analysis in this EIR and are described in detail in the subsections below:

1. **No Project Alternative** – The No Project Alternative are the circumstances under which the Proposed Project does not proceed.
2. **Alternate Process Technology Alternative** – This alternative involves a similar comprehensive upgrade to the GHWTP using an alternate pretreatment technology called high-rate clarification with ballasted flocculation (also called ballasted clarification).
3. **Reduced Capacity Alternative** – This alternative involves a comprehensive upgrade of the GHWTP but with a smaller capacity.
4. **No Solids Dewatering Alternative** – This alternative involves a comprehensive upgrade of the GHWTP with the same capacity as the Proposed Project but with fewer components and specifically, no solids dewatering facilities.

6.5.1 Alternative 1: No Project Alternative

6.5.1.1 Description

CEQA Guidelines Section 15126.6(e) generally provides that "[t]he 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is 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." Section 15126(e)(3)(B) provides that, where, as here, a proposed project is something "other than a land use or regulatory plan," the "No Project" Alternative is "the circumstance under which the project does not proceed." The purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project (CEQA Guidelines Section 15126.6[e][1]). "[W]here failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment" (CEQA Guidelines Section 15126.6[e][3][B]).

The underlying purpose of the Proposed Project is to provide for a modernized water treatment plant that: meets current seismic, building, electrical, and fire code requirements; improves the ability to treat wet season water to facilitate implementation of the City's Water Supply Augmentation Strategy (WSAC 2015) and SOWF Policy (City of Santa Cruz 2022); increases the City's treatment reliability; and improves the ability to treat variable and degraded source water quality conditions, such as those associated with post-wildfire, severe storms, and drought conditions. To accomplish these objectives, the Proposed Project includes the replacement and substantial upgrade of the majority of the existing water treatment processes at the GHWTP and associated infrastructure with modern facilities.

Under the No Project Alternative, all conditions are generally based on those existing in 2022 and include existing facilities and infrastructure at the GHWTP. None of the components of the Proposed Project would be implemented, under the No Project Alternative. However, the Concrete Tanks Project, a separate project already under construction on the GHWTP parcel will be completed under the No Project Alternative. The major elements of the Concrete Tanks Project include a new treated water storage tank with an internal baffled chlorine contactor (racetrack), a new solids storage tank and pump station, a new wash water reclaim tank and pump station, a new Electrical Building, and roadway improvements. Under the No Project Alternative, the main development area on

the GHWTP parcel would not be integrated with the new infrastructure in place at the completion of the Concrete Tanks Project, as provided for under the Proposed Project. However, if the No Project Alternative is selected, the City would likely need to pursue a separate project to provide for such integration of the main development area with the Concrete Tanks Project. Additionally, as part of such integration, this separate project would likely include the pursuit of post-chlorination. As described in Chapter 3, Project Description, the treated water storage tank under construction with the Concrete Tanks Project would contain a chlorine contactor that would permit moving the chlorine addition point to the end of the treatment process. The benefit of post-chlorination is a reduction in the time that chlorine is in contact with any remaining organic matter, thus reducing the potential for disinfection by-products (DBP) formation. If such a separate project is pursued due to the selection of the No Project Alternative, subsequent CEQA review would be required to implement such a project.

Implementation of the No Project Alternative would not support the implementation of the City's Water Supply Augmentation Strategy and SOWF Policy. Specifically, the No Project Alternative would not support conjunctive management of surface and groundwater supplies to improve water supply. In general, this involves the storage of water in local aquifers or delivery to regional water agencies during times when water is available, facilitating the return of stored water from the Mid-County Groundwater Basin and/or the Santa Margarita Groundwater Basin to the City during droughts or other shortages. Given the local climate patterns, this strategy would involve treating increased volumes of wet season surface water. These wet season waters have additional treatment requirements, due to higher turbidity and more challenging water quality conditions, which the Proposed Project would be able to treat. The No Project Alternative would not provide for the additional treatment requirements involved in treating increased volumes of wet season surface water and therefore would not support the City's effort to expand its storage capacity to deliver a safe, adequate, reliable, and environmentally sustainable water supply. As a result, the No Project Alternative would require the City to prioritize and immediately pursue other options (i.e., recycled water or seawater desalination), which are currently considered as back-up or longer-term water sources, if passive and active recharge solutions are not sufficient. If another water supply option is pursued due to the selection of the No Project Alternative, subsequent CEQA review would be required to implement such a project.

Additionally, the No Project Alternative would not provide treatment facilities and equipment that can reliably treat variable and degraded source water quality conditions. As a result, the No Project Alternative would reduce the City's ability to treat source water impacted by post-wildfire runoff and increased CECs, such as per- and polyfluoroalkyl substances (PFAS), should they exceed concentrations currently observed in the source water supplies. Additionally, the No Project Alternative would not address deficiencies at the GHWTP caused by the aging infrastructure.

6.5.1.2 Impact Analysis

Biological Resources

Under the No Project Alternative, the Proposed Project would not be implemented. The existing conditions described in Section 4.4, Biological Resources, would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. All biological resource impacts of the Proposed Project would be avoided with the No Project Alternative (see Table 6-2). Therefore, the potentially significant impacts associated with the Proposed Project new and upgraded facilities would not occur under the No Project Alternative, including those related to special-status wildlife species and protected wetlands or waters (Impacts BIO-1 and BIO-3) (*no impact*). The less than significant impacts identified for the Proposed Project related to riparian habitat, sensitive natural communities, wildlife nursery sites, and fish or wildlife habitat and populations would not occur with the No

Project Alternative (*no impact*). Additionally, the less than significant cumulative impacts related to biological resources would not occur with the No Project Alternative (*no impact*).

Geology and Soils

Under the No Project Alternative, the existing conditions described in Section 4.7, Geology and Soils, would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. All geology and soils impacts would be avoided with the No Project Alternative (see Table 6-2). Therefore, the potentially significant impact related to paleontological resources associated with the Proposed Project new and upgraded facilities would not occur under the No Project Alternative (*no impact*). The less than significant impacts identified for the Proposed Project related to seismic hazards, landslides, unstable geologic unit or soils, and expansive soils would not occur under the No Project Alternative (*no impact*). Additionally, the less than significant cumulative impacts related to geology and soils would not occur under the No Project Alternative (*no impact*).

Hazards and Hazardous Materials

Under the No Project Alternative, the existing conditions described in Section 4.9, Hazards and Hazardous Materials, would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. All hazards and hazardous materials impacts would be avoided with the No Project Alternative (see Table 6-2). Therefore, the potentially significant impact related to the routine transport, use, or disposal of hazardous materials associated with hazardous building materials and impacted soils associated with the Proposed Project new and upgraded facilities would not occur under the No Project Alternative (*no impact*). The less than significant impacts identified for the Proposed Project related to reasonably foreseeable upset or accident conditions and interference with emergency response plans would not occur under the No Project Alternative (*no impact*). Additionally, the less than significant cumulative impacts related to hazards and hazardous materials would not occur under the No Project Alternative (*no impact*).

Noise and Vibration

Under the No Project Alternative, the Proposed Project would not be implemented. The existing conditions described in Section 4.12, Noise, would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. All noise and vibration impacts would be avoided with the No Project Alternative, including the significant and unavoidable construction noise impact and the cumulative construction noise impact (*no impacts*) (see Table 6-2).

Utilities and Service Systems

Under the No Project Alternative, the existing conditions described in Section 4.14, Utilities and Service Systems, would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. The No Project Alternative would not realize the water supply benefit of the Proposed Project. As indicated in Impact UTL-2, the upgraded GHWTP would benefit water supply reliability by treating increased volumes of wet season surface water for ASR and water transfers and exchanges. In contrast to the beneficial

impact of the Proposed Project, the No Project Alternative water supply impact would be potentially significant and unavoidable until an alternative source of water supply is developed (*significant unavoidable*).

Given that the City's water supply objectives would not be met with the No Project Alternative, the City's likely prioritization and pursuit of recycled water or seawater desalination under the City's Water Supply Augmentation Strategy and SOWF Policy could result in some additional impacts that would not result from the Proposed Project. For example, if seawater desalination were selected, marine biological and hydrological impacts offshore in the Monterey Bay National Marine Sanctuary would likely result, as documented in the Proposed SCWD^2 Regional Seawater Desalination Project Draft Environmental Impact Report (URS 2013). The impacts of various recycled water options would be evaluated if and when one or more of the recycled water options are pursued by the City, as part of the Water Supply Augmentation Strategy and SOWF Policy.

The less than significant impacts related to solid waste generation and compliance with solid waste regulations would not occur under the No Project Alternative *(no impact)*. Likewise, the less than significant cumulative impacts related to utilities and service systems would not occur under the No Project Alternative *(no impact)* (see Table 6-2).

Other Impacts

Under the No Project Alternative, the Proposed Project would not be implemented. The existing conditions described in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures would be generally maintained at the GHWTP parcel, the utility corridor, the alternate sanitary sewer lateral replacement area, the Graham Hill right-of-way, and the staging areas, as Proposed Project development would not be implemented. All less than significant project and cumulative impacts related to aesthetics, air quality, cultural and tribal cultural resources, energy, greenhouse gas emissions, hydrology and water quality, land use and planning, transportation, and wildfire would be avoided with the No Project Alternative *(no impacts)* (see Table 6-2).

6.5.1.3 Ability to Meet Project Objectives

The No Project Alternative would not meet any of the identified project objectives (see Table 6-1). In particular, the No Project Alternative would not provide an adaptable water treatment facility (Objective #1), would not provide treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC) (Objective #2), would not provide treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality, and flow conditions (Objectives #3 and #4), and would not support the implementation of the City's Water Supply Augmentation Strategy and SOWF Policy (Objective #5), as it would not would benefit water supply reliability by treating increased volumes of wet season surface water for ASR and water transfers and exchanges. Under the No Project Alternative, the City would not rehabilitate existing aging infrastructure to allow reusing and extending the useful life of the GHWTP, as no improvements would be implemented (Objective #6). The objective to provide a cost-effective project and complete construction at or below the Proposed Project budget (Objective #7), would not be met as the No Project Alternative would require the City to prioritize and immediately pursue other water supply options that might be more expensive.

The No Project Alternative would not meet Objective #8, which applies the HiAP approach and equity practices to City decision-making, as the No Project Alternative would not facilitate securing reliable water supplies, consider future impacts of climate change and natural hazards to water service reliability, and meet current and foreseeable

drinking water standards. Objective #9 regarding the construction process does not apply to the No Project Alternative, as there would be no construction under this alternative. Additionally, the No Project Alternative would not meet the objectives related to providing a water treatment facility that meets current seismic, building, fire, and electrical codes (Objective #10).

6.5.2 Alternative 2: Alternate Pretreatment Technology Alternative

6.5.2.1 Description

Alternative 2 involves a similar comprehensive upgrade to the GHWTP using an alternative pretreatment[1] technology called high-rate clarification with ballasted flocculation (also called ballasted clarification), in contrast to high-rate clarification with plate settlers being considered for the Proposed Project. Ballasted clarification also relies on gravity settling and inclined plates or tubes but includes the use of microsand as a ballast (with the assistance of polymer to promote adherence of floc to the microsand) to accelerate settling rates and produce clarified water. Solids (also called water treatment residuals) and microsand are collected at the bottom of a settling tank and the sand-solids mixture is then pumped to a hydrocyclone to separate the solids from the higher density microsand. The separated microsand is recirculated from the bottom of the hydrocyclone and re-injected back to the ballasted clarification process to be reused as a ballasting agent. At the GHWTP, downstream processes such as ozone, biological filtration, future GAC, or a similar technology (and possibly UV in the future) would follow the pretreatment process, similar to the Proposed Project.

The following distinctions between ballasted clarification (Alternative 2) and high-rate clarification with plate settlers (Proposed Project) were identified by the City during the review of these pretreatment technologies:

- **Footprint.** Ballasted clarification treatment facility would have a much smaller footprint than a treatment facility using high-rate clarification with plate settlers, as it requires a short detention time.
- **Energy Use.** Ballasted clarification requires 3% less power usage than plate settlers.
- **Chemical Use.** Ballasted clarification requires a much higher overall consumption of chemicals and requires microsand, which is not required for high-rate clarification with plate settlers.
- **Construction and Operational Noise Generation.** Construction noise would be somewhat greater with the longer construction schedule (see below). While both technologies have above-ground motors that will contribute to the ambient noise environment, ballasted clarification requires hydrocyclones/sprayers in the clarification process, which are exposed to the environment and will produce more long-term operation noise than the plate settlers process. The noise can be partially mitigated with enclosures if desired; however, this would result in one more area requiring maintenance.
- **Operational Traffic.** Given that ballasted clarification requires a much higher overall consumption of chemicals and requires microsand, it would also generate more truck trips and vehicle miles traveled related to chemical deliveries.
- **Construction Traffic.** The plate settlers process of the Proposed Project reuses more of the existing pretreatment area at the GHWTP, resulting in reduced levels of demolition and imported backfill. This translates to reduced construction waste and fewer material deliveries (i.e., reduced construction truck traffic). Therefore, ballasted clarification would have greater construction waste and material deliveries (i.e., greater construction truck traffic).

[1] Pretreatment refers to the processes of coagulation, flocculation, and sedimentation and is designed to clarify water and remove turbidity and total organic carbon.

- **Water Quality and Technical Performance.** Ballasted clarification did not perform as well as high-rate clarification with plate settlers in terms of most water quality and technical performance parameters considered.
- **Operations and Maintenance.** Ballasted clarification did not perform as well as high-rate clarification with plate settlers in terms of operations and maintenance.[2]
- **Construction.** Ballasted clarification would require a longer overall construction schedule and would involve greater complexity of operations during construction.
- **Cost.** Ballasted clarification did not perform as well as high-rate clarification with plate settlers in terms of cost with the total life cycle cost for ballasted clarification being higher than for high-rate clarification with plate settlers.

Alternative 2 would include other elements of the Proposed Project. Specifically, Alternative 2 would include the potential repair or replacement of the storm drain line down to the San Lorenzo River, potential replacement of the existing sewer line in Ocean Street Extension, and traffic calming measures along Graham Hill Road near the entrance to the GHWTP. Alternative 2 would also use the Mt. Hermon Road staging area and the Ocean Street Extension staging area during construction. Additionally, the City's standard construction practices and the applicable avoidance and minimization measures from the City's Low Effect Habitat Conservation Plan (LEHCP) and associated Incidental Take Permit under Section 10(A)(1)(B) of the Endangered Species Act, identified in Chapter 3, Project Description, would apply to Alternative 2.

6.5.2.2 Impact Analysis

Biological Resources

Regarding special-status species, Alternative 2 would have reduced impacts related to San Francisco dusky-footed woodrat, as the footprint of the facility at the GHWTP would be smaller resulting in less disturbance; however, the impacts would also require the implementation of MM BIO-2, MM BIO-3, MM BIO-4 to reduce the impacts to less than significant. Impacts related to Santa Cruz black salamander, California giant salamander, and western pond turtle would be the same as with the Proposed Project, as Alternative 2 would also include the potential to repair or replace the storm drain line down to the San Lorenzo River and therefore would also require the implementation of MM BIO-1. Overall, impacts of Alternative 2 regarding special-status species would be somewhat reduced compared to the Proposed Project *(less than significant with mitigation; lesser impact).*

Alternative 2 would have the same impacts related to protected wetlands or waters, as it would also include the potential to repair or replace the storm drain line down to the San Lorenzo River and would require the implementation of MM BIO-5 to reduce the impact to less than significant *(less than significant with mitigation; similar impact).* Alternative 2 would have somewhat reduced impacts related to riparian habitat, sensitive natural communities, wildlife nursery sites, and fish or wildlife habitat and populations, given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).* Additionally, the less than significant cumulative impacts related to biological resources would be somewhat reduced with Alternative 2 given the smaller footprint of the GHWTP facility with this alternative (*less than significant; lesser impact*).

[2] The operations and maintenance (O&M) criterion focuses on ease of operation and maintainability to ensure that the level of effort required from O&M staff to run and keep the plant well maintained is minimized to the extent possible. This criterion includes operability; maintainability; ease of access to equipment and structures, and traffic efficiency; and process complexity and points of failure.

Geology and Soils

Alternative 2 would have somewhat reduced impacts related to seismic hazards, landslides, unstable geologic unit or soils, and expansive soils given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).* Alternative 2 would also have somewhat reduced impacts related to paleontological resources given the smaller footprint of the facility and the reduced ground disturbance at the site; however, the impact would also require the implementation of MM GEO-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).* Additionally, Alternative 2 would have somewhat reduced impacts related to cumulative geology and soils impacts given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).*

Hazards and Hazardous Materials

Alternative 2 would have somewhat reduced impacts related to routine transport, use, or disposal of hazardous materials associated with hazardous building materials and impacted soils given the smaller footprint of the GHWTP facility and the reduced ground disturbance at the site; however, the impact would also require the implementation of MM HAZ-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).* Alternative 2 could have somewhat increased impacts related to foreseeable upset or accident conditions given that ballasted clarification requires a much higher overall consumption of chemicals; however, the impact would also be less than significant with the implementation of federal, state, and local rules and regulations, standard construction practices, and existing and updated standard operating procedures *(less than significant; greater impact).* Alternative 2 would have somewhat increased impacts related to interference with emergency response plans; while the GHWTP facility footprint would be smaller, both construction and operational traffic would be greater under this alternative *(less than significant; greater impact).* Additionally, given the somewhat increased impacts described above, the less than significant cumulative impact of the Proposed Project related to hazards and hazardous materials would be somewhat increased with Alternative 2 (*less than significant; greater impact*).

Noise and Vibration

Alternative 2 would have somewhat increased impacts related to a permanent increase in ambient noise from operations compared to the Proposed Project. While Alternative 2 would have a smaller facility footprint, this alternative with ballasted clarification requires hydrocyclones/sprayers in the clarification process, which are exposed to the environment and would produce more long-term operation noise than the plate settlers process of the Proposed Project. The impact would also require the implementation of MM NOI-1 to reduce the impact to less than significant *(less than significant with mitigation; greater impact).*

Alternative 2 impacts related to construction vibration and groundborne noise would also be somewhat increased compared to the Proposed Project due to the longer construction period but would continue to be less than significant *(less than significant; greater impact).*

Alternative 2 would also have somewhat increased construction noise impacts related to temporary increases in ambient noise levels in excess of applicable standards. While the GHWTP facility footprint would be smaller for Alternative 2, the construction period would be longer and more complex, resulting in an overall increase in temporary noise impacts compared to the Proposed Project. The impact would also require the implementation of MM NOI-2 to reduce the impact but similar to the Proposed Project, both the project and cumulative construction noise impact would be significant and unavoidable *(significant and unavoidable; greater impact).*

Utilities and Service Systems

The impact of Alternative 2 related to water supply would also be beneficial, similar to the Proposed Project, as this alternative would also allow for treating increased volumes of wet season surface water for ASR and water transfers and exchanges *(beneficial impact; similar impact).* Proposed Project impacts related to solid waste generation and compliance with solid waste regulations would be somewhat greater than the Proposed Project, given that this alternative would have greater construction waste and material deliveries *(less than significant; greater impact).* Additionally, Alternative 2 would have similar impacts related to cumulative water and wastewater impacts *(less than significant; similar impact)* and somewhat increased impacts related to cumulative solid waste impacts *(less than significant; greater impact).*

Other Impacts

The impacts of Alternative 2 related to aesthetics, cultural and tribal cultural resources, hydrology and water quality, and land use and planning would be similar to but somewhat reduced as compared to the Proposed Project, given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).*

The impacts of Alternative 2 related to air quality, energy and greenhouse gas emissions would be similar to the Proposed Project. While the footprint of the facility would be smaller, this alternative would have greater construction traffic and a longer construction period. Additionally, while operational energy use would be somewhat less than the Proposed Project, Alternative 2 would generate more truck trips and vehicle miles traveled related to chemical deliveries during operations. Overall, the impacts of Alternative 2 related to air quality, energy and greenhouse gas emissions would be similar to the Proposed Project *(less than significant; similar impact).*

The impacts of Alternative 2 related to transportation would be somewhat greater than the Proposed Project, as it would have greater construction and operational traffic; however, the impacts would continue to be less than significant, as the increases in such traffic and associated vehicle miles travelled would not be substantial *(less than significant; greater impact).*

The impacts of Alternative 2 related to wildfire would be similar to the Proposed Project. While Alternative 2 would have a smaller footprint that could allow for maintaining more available fuels on the project site, the construction period would be longer, which could somewhat increase construction-phase fire risk. Overall, the impacts of Alternative 2 related to wildfire would be similar to the Proposed Project *(less than significant; similar impact).*

6.5.2.3 Ability to Meet Project Objectives

The Alternative 2 would meet or partially meet most of the identified project objectives (see Table 6-1). While Alternative 2 would provide an adaptable water treatment facility (Objective #1), it would only partially meet objectives related to providing treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC) (Objective #2), and related to providing treatment facilities and equipment that reliably meet the City's updated treatment goals, providing for efficient operations and maintenance, and that can adapt to future regulations, source water quality, and flow conditions (Objectives #3 and #4), as this alternative did not perform as well as the Proposed Project in terms of the most of the water quality and technical performance parameters considered.

Alternative 2 would support the implementation of the City's Water Supply Augmentation Strategy and SOWF Policy (Objective #5), as it would benefit water supply reliability by treating increased volumes of wet season surface water for ASR and water transfers and exchanges. Additionally, Alternative 2 would extend the useful life of the GHWTP as comprehensive upgrades would be implemented (Objective #6). The objective to provide a cost-effective project and complete construction at or below the Proposed Project budget (Objective #7), would be partially met with Alternative 2, as this alternative would be more expensive to construct and operate.

Alternative 2 would partially meet Objective #8, which applies the HiAP approach and equity practices to City decision-making, as this alternative would facilitate securing reliable water supplies, consider future impacts of climate change and natural hazards to water service reliability, and meet current and foreseeable drinking water standards; however, as indicated above, this alternative did not perform as well as the Proposed Project in terms of most of the water quality and technical performance parameters considered. Objective #9 regarding the construction process would be partially met by Alternative 2, as it would require a longer overall construction schedule and would involve greater complexity of operations during construction. Additionally, Alternative 2 would meet the objectives related to providing a water treatment facility that meets current seismic, building, fire, and electrical codes (Objective #10).

6.5.3 Alternative 3: Reduced Capacity Alternative

6.5.3.1 Description

Alternative 3 involves a comprehensive upgrade of the GHWTP but with a smaller capacity. The capacity of the GHWTP with Alternative 3 would be reduced to 15 mgd, as compared to 18.2 mgd with the Proposed Project. This reduced capacity would be adequately served by the existing reclaimed water clarifiers (lamella clarifiers) and would not require expansion of the lamella clarifiers from two to four, as would be required with the Proposed Project. The capacity to meet the City's Water Supply Augmentation Strategy would be reduced at times when the treatment plant is experiencing peak winter/spring water demand and would not fully meet the identified water supply capacity of the Proposed Project, described in Chapter 3, Project Description.

The following distinctions between Alternative 3 and the Proposed Project were identified:

- **Footprint.** Alternative 3 would have a smaller footprint than the Proposed Project given the reduced capacity under this alternative.
- **Energy Use.** Alternative 3 would use less energy than the Proposed Project given the reduced capacity under this alternative.
- **Chemical Use.** Alternative 3 would use less chemicals than the Proposed Project given the reduced capacity under this alternative.
- **Construction and Operational Noise Generation.** Construction and operational noise would be somewhat reduced with Alternative 3 due to the reduced capacity and shorter construction period (see below).
- **Construction and Operational Traffic.** Given that Alternative 3 would have a shorter construction period and would have a smaller capacity and use less chemicals during operations, it would have reduced construction and operational truck trips and vehicle miles traveled.
- **Water Quality and Technical Performance.** Alternative 3 would perform as well as the Proposed Project in terms of most water quality and technical performance parameters considered, as it would involve the same pretreatment and treatment technologies as the Proposed Project.

- **Operations and Maintenance.** Alternative 3 would perform as well as the Proposed Project in terms of operations and maintenance, as it would involve the same pretreatment and treatment technologies as the Proposed Project.
- **Construction.** Alternative 3 would require a shorter construction schedule given the reduced capacity under this alternative.
- **Cost.** Alternative 3 would have a reduced total life cycle cost compared to the Proposed Project given the reduced capacity and shorter construction period under this alternative. However, it may not be as cost-effective in the long-term as the smaller capacity plant may not meet the long-term needs of the City.

As with Alternative 2, Alternative 3 would include other elements of the Proposed Project. Specifically, Alternative 3 would include the potential repair or replacement of the storm drain line down to the San Lorenzo River, potential replacement of the existing sewer line in Ocean Street Extension, and traffic calming measures along Graham Hill Road near the entrance to the GHWTP. Alternative 3 would also use the Mt. Hermon Road staging area and the Ocean Street Extension staging area during construction. Additionally, the City's standard construction practices and the applicable avoidance and minimization measures from the City's LEHCP and associated Incidental Take Permit under Section 10(A)(1)(B) of the Endangered Species Act, identified in Chapter 3, Project Description, would apply to Alternative 3.

6.5.3.2 Impact Analysis

Biological Resources

Regarding special-status species, Alternative 3 would have reduced impacts related to San Francisco dusky-footed woodrat, as the footprint of the facility at the GHWTP would be smaller resulting in less disturbance; however, the impacts would also require the implementation of MM BIO-2, MM BIO-3, MM BIO-4 to reduce the impacts to less than significant. Impacts related to Santa Cruz black salamander, California giant salamander, and western pond turtle would be the same as with the Proposed Project, as Alternative 3 would also include the potential to repair or replace the storm drain line down to the San Lorenzo River. Overall, impacts of Alternative 3 regarding special-status species would be somewhat reduced compared to the Proposed Project *(less than significant with mitigation; lesser impact).*

Alternative 3 would have the same impacts related to protected wetlands or waters, as it would also include the potential to repair or replace the storm drain line down to the San Lorenzo River and would require the implementation of MM BIO-5 to reduce the impact to less than significant *(less than significant with mitigation; similar impact).* Alternative 3 would have somewhat reduced impacts related to riparian habitat, sensitive natural communities, wildlife nursery sites, and fish or wildlife habitat and populations, given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).* Additionally, the less than significant cumulative impacts related to biological resources would be somewhat reduced with Alternative 3 given the smaller footprint of the GHWTP facility with this alternative (*less than significant; lesser impact*).

Geology and Soils

Alternative 3 would have somewhat reduced impacts related to seismic hazards, landslides, unstable geologic unit or soils, and expansive soils given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).* Alternative 3 would also have somewhat reduced impacts related to paleontological resources given the smaller footprint of the GHWTP facility and the reduced ground disturbance at the GHWTP parcel; however, the impact would also require the implementation of MM GEO-1 to reduce the impact to less than significant *(less than significant with*

mitigation; lesser impact). Additionally, Alternative 3 would have somewhat reduced impacts related to cumulative geology and soils impacts given the smaller footprint of the facility *(less than significant; lesser impact).*

Hazards and Hazardous Materials

Alternative 3 would have somewhat reduced impacts related to routine transport, use, or disposal of hazardous materials associated with hazardous building materials and impacted soils given the smaller footprint of the GHWTP facility and the reduced ground disturbance at the GHWTP parcel; however, the impact would also require the implementation of MM HAZ-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).* Alternative 3 would also have somewhat reduced impacts related to foreseeable upset or accident conditions and interference with emergency response plans given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).* Additionally, given the smaller footprint of the GHWTP facility, the less than significant cumulative impact of the Proposed Project related to hazards and hazardous materials would be somewhat reduced with Alternative 3 (*less than significant; lesser impact*).

Noise and Vibration

Alternative 3 would have somewhat reduced impacts related to a permanent increase in ambient noise from operations due to the reduced capacity and footprint of the facility compared to the Proposed Project; however, the impact would also require the implementation of MM NOI-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).*

Alternative 3 impacts related to construction vibration and groundborne noise would also be somewhat reduced compared to the Proposed Project due to the smaller facility footprint and shorter construction period *(less than significant; lesser impact).*

Alternative 3 would also have somewhat reduced construction noise impacts compared to the Proposed Project related to temporary increases in ambient noise levels in excess of applicable standards due to the smaller facility footprint and shorter construction period. However, the impact would also require the implementation of MM NOI-2 to reduce the impact but similar to the Proposed Project, both the project and cumulative construction noise impact would be significant and unavoidable *(significant and unavoidable; lesser impact).*

Utilities and Service Systems

The impact of Alternative 3 related to water supply would also be beneficial, as this alternative would also allow for treating increased volumes of wet season surface water for ASR and water transfers and exchanges; however, the capacity of this alternative to meet water supply augmentation needs would be reduced compared to the Proposed Project *(beneficial impact; lesser impact).* Proposed Project impacts related to solid waste generation and compliance with solid waste regulations would be reduced compared to the Proposed Project, given the smaller capacity and footprint of the GHWTP facility *(less than significant; lesser impact).* Additionally, Alternative 3 would have somewhat reduced impacts related to cumulative water and wastewater impacts *(less than significant; lesser impact)* and related to cumulative solid waste impacts *(less than significant; lesser impact),* given the smaller capacity and footprint of the GHWTP facility.

Other Impacts

The impacts of Alternative 3 related to aesthetics, cultural and tribal cultural resources, hydrology and water quality, and land use and planning would be similar to but somewhat reduced as compared to the Proposed Project, given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).*

The impacts of Alternative 3 related to air quality, energy and greenhouse gas emissions would be reduced compared to the Proposed Project, given the reduced capacity, reduced energy use, smaller footprint of the GHWTP facility, and shorter construction period *(less than significant; lesser impact).* The impacts of Alternative 3 related to transportation would also be reduced compared to the Proposed Project, given the reduced capacity, smaller footprint of the GHWTP facility, and shorter construction period *(less than significant; lesser impact).*

Likewise, the impacts of Alternative 3 related to wildfire would be somewhat reduced compared to the Proposed Project. While the smaller GHWTP facility footprint could result in maintaining more available fuels on the project site, the shorter construction period would result in reduced construction-phase fire risk. Overall, the impacts of Alternative 3 related to wildfire would be somewhat reduced *(less than significant; lesser impact).*

6.5.3.3 Ability to Meet Project Objectives

The Alternative 3 would meet most of the identified project objectives (see Table 6-1). Alternative 3 would provide: an adaptable water treatment facility (Objective #1), treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC) (Objective #2), and treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality, and flow conditions (Objectives #3 and #4), as this alternative includes the same pretreatment and treatment technologies as the Proposed Project.

Alternative 3 would partially support the implementation of the City's Water Supply Augmentation Strategy and SOWF Policy (Objective #5), as it would benefit water supply reliability by treating increased volumes of wet season surface water for ASR and water transfers and exchanges but not to the same extent as the Proposed Project because it would not be capable of producing as much treated water. Alternative 3 would partially meet the objective to provide a cost-effective project and complete construction at or below the Proposed Project budget (Objective #7), as this alternative would be less expensive to construct and operate but may not be as cost effective in the long term as the smaller capacity plant may not meet the long-term needs of the City.

Alternative 3 would extend the useful life of the GHWTP as comprehensive upgrades would be implemented (Objective #6). It would meet Objective #8, which applies the HiAP approach and equity practices to City decision-making, as this alternative would facilitate securing reliable water supplies, consider future impacts of climate change and natural hazards to water service reliability, and meet current and foreseeable drinking water standards. Objective #9 regarding the construction process would be met by Alternative 3, as it would require a shorter overall construction schedule and therefore would have fewer operational challenges during construction. Additionally, Alternative 3 would meet the objectives related to providing a water treatment facility that meets current seismic, building, fire, and electrical codes (Objective #10).

6.5.4 Alternative 4: No Solids Dewatering Alternative

6.5.4.1 Description

Alternative 4 involves a comprehensive upgrade of the GHWTP with the same capacity as the Proposed Project but with fewer components. Specifically, Alternative 4 would not install the new approximately 2,100-square foot Solids Dewatering Building and associated solids dewatering equipment including centrifuge, drive-through unloading operation and equipment, thickened solids equalization tank, and dewatering feed pump station. Given that the thickened solids equalization tank would be repurposed from an existing concrete bulk storage tank for the Proposed Project, this tank would either be retained, repurposed, abandoned in place, or demolished, with Alternative 4.

This alternative would retain the sewer discharge improvements of the Proposed Project to support sending treatment residuals to the Santa Cruz Wastewater Treatment Facility. The sewer discharge improvements involve either discharge to the Santa Cruz County (County) sewer line in Graham Hill Road to connect to the County's line, and/or discharge to a City sewer line in Ocean Street Extension. Alternative 4 assumes that the Santa Cruz Wastewater Treatment Facility (WWTF) would accept all the treatment residuals, which may not be feasible.

For Alternative 4 to be feasible, the GHWTP effluent must meet the Santa Cruz WWTF's local limits for both the discharge point at the existing GHWTP sewer lateral and at the proposed new discharge point to the County sewer line in Graham Hill Road. Local limits are applicable to all connections to the sanitary sewer system and address the WWTF's need to satisfy the wastewater treatment system effluent limits established by National Pollutant Discharge Elimination System (NPDES) permit for the protection of receiving water quality. Specifically, the GHWTP discharges would need to comply with Santa Cruz Municipal Code 16.08.110 regarding limitations on wastewater discharges and the maximum concentrations of pollutants allowable in wastewater discharges to the wastewater treatment system. Additionally, a determination would need to be made that there are no capacity limitations in the City's sewer system that would receive GHWTP effluent from either discharge options presented above: from the County sewer line in Graham Hill Road or from the City sewer line in Ocean Street Extension.

The following distinctions between Alternative 4 and the Proposed Project were identified:

- **Footprint.** Alternative 4 would have a smaller footprint than the Proposed Project given the elimination of the Solids Dewatering Building and associated solids handling equipment under this alternative.
- **Energy Use.** Alternative 4 would use less energy than the Proposed Project given the elimination of the Solids Dewatering Building and associated solids handling equipment under this alternative.
- **Chemical Use.** Alternative 4 would use less chemicals than the Proposed Project given the elimination of the Solids Dewatering Building and associated solids handling equipment and processes under this alternative.
- **Construction and Operational Noise Generation.** Construction and operational noise would be reduced with Alternative 4 due to the elimination of the Solids Dewatering Building and associated solids handling equipment and shorter construction period (see below).
- **Construction and Operational Traffic.** Given that Alternative 4 would have a shorter construction period and would use less chemicals during operations, it would have reduced construction and operational truck trips and vehicle miles traveled.
- **Water Quality and Technical Performance.** Alternative 4 would perform as well as the Proposed Project in terms of most water quality and technical performance parameters considered, as it would involve the same pretreatment and treatment technologies as the Proposed Project.

- **Operations and Maintenance.** Alternative 4 would perform as well as the Proposed Project in terms of operations and maintenance. However, the need for operations and maintenance activities related to the Solids Dewatering Building and related solids handling process would be reduced with this alternative.
- **Construction.** Alternative 4 would require a shorter construction schedule given the elimination of the Solids Dewatering Building and associated solids handling equipment under this alternative.
- **Cost.** Alternative 4 would have a reduce total life cycle cost compared to the Proposed Project given the elimination of the Solids Dewatering Building and associated solids handling equipment and shorter construction period under this alternative.

As with Alternatives 2 and 3, Alternative 4 would include other elements of the Proposed Project. Specifically, Alternative 4 would include the potential repair or replacement of the storm drain line down to the San Lorenzo River, potential replacement of the existing sewer line in Ocean Street Extension, and traffic calming measures along Graham Hill Road near the entrance to the GHWTP. Alternative 4 would also use the Mt. Hermon Road staging area and the Ocean Street Extension staging area during construction. Additionally, the City's standard construction practices and the applicable avoidance and minimization measures from the City's LEHCP and associated Incidental Take Permit under Section 10(A)(1)(B) of the Endangered Species Act, identified in Chapter 3, Project Description, would apply to Alternative 4.

6.5.4.2 Impact Analysis

Biological Resources

Regarding special-status species, Alternative 4 would have reduced impacts related to San Francisco dusky-footed woodrat, as the footprint of the facility at the GHWTP would be smaller resulting in less disturbance; however, the impacts would also require the implementation of MM BIO-2, MM BIO-3, MM BIO-4 to reduce the impacts to less than significant. Impacts related to Santa Cruz black salamander, California giant salamander, and western pond turtle would be the same as with the Proposed Project, as Alternative 4 would also include the potential to repair or replace the storm drain line down to the San Lorenzo River. Overall, impacts of Alternative 4 regarding special-status species would be somewhat reduced compared to the Proposed Project *(less than significant with mitigation; lesser impact).*

Alternative 4 would have the same impacts related to protected wetlands or waters, as it would also include the potential to repair or replace the storm drain line down to the San Lorenzo River and would require the implementation of MM BIO-5 to reduce the impact to less than significant *(less than significant with mitigation; similar impact).* Alternative 4 would have somewhat reduced impacts related to riparian habitat, sensitive natural communities, wildlife nursery sites, and fish or wildlife habitat and populations, given the smaller footprint of the GHWTP facility with this alternative *(less than significant; lesser impact).* Additionally, the less than significant cumulative impacts related to biological resources would be somewhat reduced with Alternative 4 given the smaller footprint of the GHWTP facility with this alternative (*less than significant; lesser impact*).

Geology and Soils

Alternative 4 would have somewhat reduced impacts related to seismic hazards, landslides, unstable geologic unit or soils, and expansive soils given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).* Alternative 4 would also have somewhat reduced impacts related to paleontological resources given the smaller footprint of the GHWTP facility and the reduced ground disturbance at the GHWTP parcel; however, the impact would also require the implementation of MM GEO-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).* Additionally, Alternative 4 would have somewhat reduced impacts related to cumulative geology and soils impacts given the smaller footprint of the facility *(less than significant; lesser impact).*

Hazards and Hazardous Materials

Alternative 4 would have somewhat reduced impacts related to routine transport, use, or disposal of hazardous materials associated with hazardous building materials and impacted soils given the smaller footprint of the GHWTP facility and the reduced ground disturbance at the GHWTP parcel; however, the impact would also require the implementation of MM HAZ-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).* Alternative 4 would also have somewhat reduced impacts related to foreseeable upset or accident conditions and interference with emergency response plans given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).* Additionally, given the smaller footprint of the GHWTP facility, the less than significant cumulative impact of the Proposed Project related to hazards and hazardous materials would be somewhat reduced with Alternative 4 (*less than significant; lesser impact*).

Noise and Vibration

Alternative 4 would have reduced impacts compared to the Proposed Project related to a permanent increase in ambient noise from operations due to the smaller footprint of the facility and the elimination of the Solids Dewatering Building and related solids handling processes; however, the impact would also require the implementation of MM NOI-1 to reduce the impact to less than significant *(less than significant with mitigation; lesser impact).*

Alternative 4 impacts related to construction vibration and groundborne noise would also be reduced compared to the Proposed Project due to the smaller footprint and shorter construction period *(less than significant; lesser impact).*

Alternative 4 would also have reduced construction noise impacts compared to the Proposed Project related to temporary increases in ambient noise levels in excess of applicable standards due to the smaller footprint and shorter construction period. However, the impact would also require the implementation of MM NOI-2 to reduce the impact but similar to the Proposed Project both the project and cumulative impact would be significant and unavoidable *(significant and unavoidable; lesser impact).*

Utilities and Service Systems

The impact of Alternative 4 related to water supply would also be beneficial, as this alternative would allow for treating increased volumes of wet season surface water for ASR and water transfers and exchanges at the same capacity as the Proposed Project *(beneficial impact; similar impact).* Proposed Project impacts related to solid waste generation and compliance with solid waste regulations would be reduced compared to the Proposed Project, given the smaller footprint of the GHWTP facility and shorter construction period *(less than significant; lesser impact).* Additionally, Alternative 4 would have somewhat reduced impacts related to cumulative water and wastewater

impacts *(less than significant; lesser impact)* and related to cumulative solid waste impacts *(less than significant; lesser impact),* given the smaller footprint of the GHWTP facility.

Other Impacts

The impacts of Alternative 4 related to aesthetics, cultural and tribal cultural resources, hydrology and water quality, and land use and planning would be similar to but somewhat reduced as compared to the Proposed Project, given the smaller footprint of the GHWTP facility *(less than significant; lesser impact).*

The impacts of Alternative 4 related to air quality, energy and greenhouse gas emissions would be reduced compared to the Proposed Project, given the reduced energy use, smaller footprint of the GHWTP facility, and shorter construction period *(less than significant; lesser impact).* The impacts of Alternative 4 related to transportation would also be reduced compared to the Proposed Project, given the elimination of the Solids Dewatering Buildings and associated operations, smaller footprint of the GHWTP facility, and shorter construction period *(less than significant; lesser impact).*

Likewise, the impacts of Alternative 4 related to wildfire would be somewhat reduced compared to the Proposed Project. While the smaller GHWTP facility footprint could result in maintaining more available fuels on the project site, the shorter construction period would result in reduced construction-phase fire risk. Overall, the impacts of Alternative 4 related to wildfire would be somewhat reduced *(less than significant; lesser impact).*

6.5.4.3 Ability to Meet Project Objectives

The Alternative 4 would meet all the identified project objectives (see Table 6-1), assuming this alternative is determined to be feasible regarding meeting limitations on wastewater discharges and the maximum concentrations of pollutants allowable in wastewater discharges to the wastewater treatment system. Alternative 4 would provide: an adaptable water treatment facility (Objective #1), treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring TOC) (Objective #2), and treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality, and flow conditions (Objectives #3 and #4), as this alternative includes the same pretreatment and treatment technologies as the Proposed Project.

Alternative 4 would fully support the implementation of the City's Water Supply Augmentation Strategy and SOWF Policy (Objective #5), as it would benefit water supply reliability by treating increased volumes of wet season surface water for ASR and water transfers and exchanges to the same extent as the Proposed Project. Alternative 4 would fully meet the objective to provide a cost-effective project and complete construction at or below the Proposed Project budget (Objective #7), as this alternative would be less expensive to construct and operate given the elimination of the Solids Dewatering Building and solids handling processes. However, it should be noted that the Proposed Project's solids handling process would not be eliminated but rather would be transferred to the WWTF and therefore Alternative 4 may have similar operational costs, as anticipated by the Proposed Project.

Alternative 4 would extend the useful life of the GHWTP as comprehensive upgrades would be implemented (Objective #6). It would meet Objective #8, which applies the HiAP approach and equity practices to City decision-making, as this alternative would facilitate securing reliable water supplies, consider future impacts of climate change and natural hazards to water service reliability, and meet current and foreseeable drinking water

standards. Objective #9 regarding the construction process would be met by Alternative 4, as it would require a shorter overall construction schedule and therefore would have fewer operational challenges during construction. Additionally, Alternative 4 would meet the objectives related to providing a water treatment facility that meets current seismic, building, fire, and electrical codes (Objective #10).

6.6 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 6-2 presents a comparison of project and cumulative impacts of the Proposed Project and the alternatives. While the No Project Alternative (Alternative 1) would avoid most of the impacts of the Proposed Project, it would not realize the water supply benefit of the Proposed Project and the water supply impact of the No Project Alternative would be potentially significant and unavoidable until an alternative source of water supply is developed (see Table 6-2). Given that the City's water supply objectives would not be met with the No Project Alternative, the City's likely prioritization and pursuit of recycled water and/or seawater desalination under the City's Water Supply Augmentation Strategy and SOWF Policy could result in some additional impacts that would not result from the Proposed Project. Given this, the No Project Alternative is not the environmentally superior alternative and therefore an environmentally superior alternative among the other alternatives does not need to be identified under CEQA Guidelines Section 15126.6(e)(2).

While not required to identify an environmentally superior alternative among the other alternatives, the City has concluded that Alternative 4 may be the environmentally superior alternative. Alternative 2 would result in greater impacts in some categories and reduced impacts in other categories, compared to the Proposed Project. In particular, Alternative 2 would result in somewhat increased construction noise impacts given that the construction period would be longer and more complex and therefore would increase the significant and unavoidable project and cumulative construction noise impact, as compared to the Proposed Project.

While both Alternative 3 and Alternative 4 would result in reduced impacts in all categories, compared to the Proposed Project, Alternative 4 would reduce impacts of the Proposed Project to a greater extent than would Alternative 3. Given that Alternative 4 would have a smaller GHWTP facility footprint, marginally less operational energy use, marginally less construction noise, less operational noise, and less construction and operational traffic, as compared to Alternative 3, Alternative 4 would reduce impacts of the Proposed Project to a greater extent than would Alternative 3. However, neither Alternative 3 or Alternative 4 would avoid the significant and unavoidable project and cumulative construction noise impact, as MM NOI-2 would reduce but not likely avoid such an impact.

While Alternative 4 may be environmentally superior to the Proposed Project it may also result in transferring some impacts of the Proposed Project to the WWTF, which may offset some of the environmental benefits of Alternative 4. For example, the marginally less operational energy use associated with Alternative 4, may result in increased energy use at the WWTF to process the Proposed Project's solids. However, until the feasibility of Alternative 4 is determined and evaluated, as described in Section 6.5.3.1, through collaboration between the City's Water

Department and Public Works Department, it is not possible to fully assess the environmental benefits and tradeoffs associated with Alternative 4.

Table 6-1. Ability of Alternatives to Meet Project Objectives

Objective	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Objective #1: Provide an adaptable water treatment facility, that can readily recover from and/or adjust to changing water quality or other potentially disruptive events by using multiple process tools, operational changes, switching between supply sources, or adjusting flow rates.	Meets Objective	Does Not Meet Objective	Meets Objective	Meets Objective	Meets Objective
Objective #2: Provide treatment facilities and equipment that reliably and efficiently produce potable water in full compliance with local, state, and federal regulations over the range of source water quality conditions expected of the City's source waters (e.g., wet season water, Loch Lomond Reservoir water with higher levels of naturally occurring total organic carbon [TOC]).	Meets Objective	Does Not Meet Objective	Partially Meets Objective	Meets Objective	Meets Objective
Objective #3: Provide treatment facilities and equipment that reliably meet the City's updated treatment goals, provide for treatment of currently unregulated contaminants (e.g., contaminants of emerging concern [CECs]), provide for efficient operations and maintenance, and that can adapt to future regulations, source water quality changes, and flow conditions.	Meets Objective	Does Not Meet Objective	Partially Meets Objective	Meets Objective	Meets Objective

Table 6-1. Ability of Alternatives to Meet Project Objectives

Objective	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Objective #4: Provide flexibility for installation of additional treatment equipment, if warranted, to adapt to future regulations, source water quality and flow conditions.	Meets Objective	Does Not Meet Objective	Partially Meets Objective	Meets Objective	Meets Objective
Objective #5: Support the implementation of the City's Water Supply Augmentation Strategy related to passive recharge of regional aquifers via water transfers and exchanges and active recharge of regional aquifers via aquifer storage and recovery [ASR]) and SOWF Policy in order to deliver a safe, adequate, reliable and environmentally sustainable water supply.	Meets Objective	Does Not Meet Objective	Meets Objective	Partially Meets Objective	Meets Objective
Objective #6: Rehabilitate existing aging infrastructure to allow reusing and extending its useful life, to the extent feasible, or decommissioning and replacing it.	Meets Objective	Does Not Meet Objective	Meets Objective	Meets Objective	Meets Objective
Objective #7: Provide a cost-effective project that optimizes the benefits and total cost of ownership (i.e., life cycle cost) for the City and complete construction at or below the Proposed Project budget.	Meets Objective	Does Not Meet Objective	Partially Meets Objective	Partially Meets Objective	Meets Objective
Objective #8: Support the City's effort and policy to apply Health in All Policies (HiAP) approach and equity practices to City decision-making. The HiAP approach includes three pillars: sustainability, equity, and public health. The Santa Cruz Water Department	Meets Objective	Does Not Meet Objective	Partially Meets Objective	Meets Objective	Meets Objective

Table 6-1. Ability of Alternatives to Meet Project Objectives

Objective	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
goals under these pillars include: A. Sustainability: Support the health of the surrounding environment, implement environmentally superior building materials and designs, reduce energy and water use in municipal buildings reduce greenhouse gas emissions, and support the development of renewable energy sources. B. Equity: Create and foster maximum organizational effectiveness, such as providing responsible financial stewardship, and identifying and engaging a diverse set of potential stakeholders. C. Public Health: Preserve and secure reliable water supplies, considering future impacts of climate change and natural hazards to water service reliability and meeting current and foreseeable drinking water standards.					
Objective #9: Throughout the construction process, maintain production of potable water delivery throughout the City distribution system, without incurring emergency plant shutdowns, permit violations, or exceedances of drinking water standards, due to construction activities.	Meets Objective	Not Applicable	Partially Meets Objective	Meets Objective	Meets Objective

Table 6-1. Ability of Alternatives to Meet Project Objectives

Objective	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Objective #10: Provide a water treatment facility that meets current seismic, building, fire, and electrical codes; protects buildings in the wildland urban interface, as warranted; and meets DDW permitting requirements.	Meets Objective	Does Not Meet Objective	Meets Objective	Meets Objective	Meets Objective

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Aesthetics					
Impact AES-1: Scenic Vistas. The Proposed Project's construction and operational activities would not eliminate or substantially adversely affect, modify, or obstruct a visually prominent or significant public scenic vista, public viewing area, or public view corridor	LS	NI	LS↓	LS↓	LS↓
Impact AES-2: Scenic Quality. The Proposed Project would not substantially degrade the existing visual character or quality of the surrounding area (i.e., be incompatible with the scale or visual character of the surrounding area, or substantially detract from the integrity, character, and/or aesthetic character of the neighborhood.	LS	NI	LS↓	LS↓	LS↓
Impact AES-3: Light and Glare. The Proposed Project components, including new sources of lighting, new structures, and new materials, would not adversely affect daytime or nighttime views or activities in the area or pose a nuisance.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact AES-4: Cumulative Impacts Related to Aesthetics. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to aesthetics.	LS	NI	LS↓	LS↓	LS↓
Air Quality					
Impact AIR-1: Conflict with Air Quality Plan. Construction and operation of the Proposed Project would result in emissions of criteria pollutants but would not exceed adopted thresholds of significance and therefore would not conflict with the Monterey Bay Air Resources District's (MBARD's) Air Quality Management Plan (AQMP).	LS	NI	LS	LS↓	LS↓
Impact AIR-2: Criteria Pollutant Emissions. Construction and operation of 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	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
which the project region is non-attainment under an applicable federal or state ambient air quality standard.					
Impact AIR-3: Exposure of Sensitive Receptors. The Proposed Project would not potentially expose sensitive receptors to substantial pollutant concentrations during short-term construction or during long-term operations.	LS	NI	LS	LS↓	LS↓
Impact AIR-4: Other Emissions Adversely Affecting a Substantial Number of People. Construction and operation of the Proposed Project would not result in other emissions that would adversely affect a substantial number of people.	LS	NI	LS	LS↓	LS↓
Impact AIR-5: Cumulative Air Quality 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 air quality.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Biological Resources					
Impact BIO-1: Special-Status Species. The Proposed Project would have no impact on special-status plants but could have a substantial adverse effect on some special-status wildlife species during construction.	LSM	NI	LSM↓	LSM↓	LSM↓
Impact BIO-2: Riparian Habitat or Sensitive Natural Communities. The Proposed Project would not have a substantial adverse effect on riparian habitat or sensitive natural communities.	LS	NI	LS↓	LS↓	LS↓
Impact BIO-3: State or Federally Protected Wetlands or Waters. The Proposed Project could have a substantial adverse effect on state or federally protected wetlands or waters.	LSM	NI	LSM	LSM	LSM
Impact BIO-4: Native Wildlife Nursery Sites. The Proposed Project would not impede the use of native wildlife nursery sites by removing or causing abandonment of active native bird nests.	LS	NI	LS↓	LS↓	LS↓
Impact BIO-5: Fish or Wildlife Species Habitat or Population Levels. The Proposed Project would not substantially reduce fish or wildlife species habitat or cause a fish or wildlife population to drop below self-sustaining levels.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact BIO-6: Cumulative Biological Resources Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact related to biological resources, but the Proposed Project's contribution to this impact would not be cumulatively considerable.	LS	NI	LS↓	LS↓	LS↓
Cultural Resources and Tribal Cultural Resources					
Impact CUL-1: Historical (Built Environment) Resources. The Proposed Project would not cause a substantial adverse change in the significance of historical built environment resource, pursuant to Section 15064.5.	LS	NI	LS	LS	LS
Impact CUL-2: Archaeological Resources and Human Remains. The Proposed Project would not cause a substantial adverse change in the significance of unique archaeological resources (pursuant to Section 15064.5) or historical resources of an archaeological nature, and/or disturb human remains.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact CUL-3: Tribal Cultural Resources: The Proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource.	LS	NI	LS↓	LS↓	LS↓
Impact CUL-4: Cumulative Cultural Resources and Tribal Cultural 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 cultural resources and tribal cultural resources.	LS	NI	LS↓	LS↓	LS↓
Energy					
Impact ENE-1: Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources. The Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources.	LS	NI	LS	LS↓	LS↓
Impact 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.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact 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.	LS	NI	LS	LS↓	LS↓
Geology and Soils					
Impact GEO-1: Seismic Hazards. 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.	LS	NI	LS↓	LS↓	LS↓
Impact GEO-2: Landslides. The Proposed Project would not cause potential substantial adverse effects involving landslides, including the risk of loss, injury, or death.	LS	NI	LS↓	LS↓	LS↓
Impact GEO-3: Unstable Geologic Unit or Soils. The Proposed Project would not 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.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact GEO-4: Expansive Soils. The Proposed Project would potentially be located on expansive soil, as defined in the 2022 California Building Code, but would not create substantial direct or indirect risks to life or property.	LS	NI	LS↓	LS↓	LS↓
Impact GEO-5: 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.	LSM	NI	LSM↓	LSM↓	LSM↓
Impact GEO-6: 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.	LS	NI	LS↓	LS↓	LS↓
Impact GEO-7: 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.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Greenhouse Gas Emissions					
Impact GHG-1: Greenhouse Gas Emissions. The Proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	LS	NI	LS	LS↓	LS↓
Impact GHG-2: Conflict with an Applicable GHG 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.	LS	NI	LS	LS↓	LS↓
Impact GHG-3: Cumulative GHG Impacts. 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.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Hazards and Hazardous Materials					
Impact HAZ-1: Routine Transport, Use, or Disposal of Hazardous Materials. Construction and operation of the Proposed Project would require routine use and transportation of hazardous materials but would not result in a significant hazard to the public or environment. Demolition, construction, and excavation activities have the potential to create a significant hazard to the public or environment due to the improper handling, transportation, and disposal of hazardous building materials and impacted soils.	LSM	NI	LSM↓	LSM↓	LSM↓
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.	LS	NI	LS↑	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact HAZ-3: Interfere with Emergency Response Plans. The Proposed Project would not impair implementation of or physically interfere with existing emergency response plan or emergency evacuation plan.	LS	NI	LS↑	LS↓	LS↓
Impact HAZ-4: Cumulative Hazard Impacts. 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.	LS	NI	LS↑	LS↓	LS↓
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 or groundwater quality. In addition, the Proposed Project would not conflict with or obstruct implementation of a water quality control plan related to surface water.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact HYD-2: Decrease Groundwater Supplies, Interfere with Groundwater Recharge, or Conflict with Groundwater Plan. Construction and operation of the Proposed Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that sustainable groundwater management of the basin would be impeded or such that conflict or obstruction of a sustainable groundwater management plan would occur.	LS	NI	LS↓	LS↓	LS↓
Impact HYD-3: Alteration to the Existing Drainage Patter of the Site Area. Construction and operation of 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: (a) result in substantial erosion or siltation on or off site; (b) substantially increase the rate or amount of surface runoff in a manner which	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
would result in flooding on or off site; (c) 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 (d) impede or redirect flood flows.					
Impact HYD-4: Flood, Tsunamis, and Seiche Zones. Construction and operation of the Proposed Project in flood hazard, tsunami, or seiche zones would not risk release of pollutants due to project inundation	LS	NI	LS↓	LS↓	LS↓
Impact HYD-5: Cumulative Hydrology and Water Quality 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 surface water hydrology and water quality.	LS	NI	LS↓	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Land Use and Planning					
Impact LU-1: Conflicts with Land Use Plans, Policies, or Regulations. Construction and operation of the Proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LS	NI	LS↓	LS↓	LS↓
Impact LU-2: Cumulative Land Use and Planning 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 conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	LS	NI	LS↓	LS↓	LS↓
Noise and Vibration					
Impact NOI-1: Substantial Permanent Increase in Ambient Noise Levels. The Proposed Project could result in a substantial permanent increase in noise levels in the project vicinity above ambient levels without the project.	LSM	NI	LSM↑	LSM↓	LSM↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact NOI-2: Substantial Temporary or Permanent Increase in Ambient Noise Levels in Excess of Applicable Standards. The Proposed Project would result in substantial noise levels in the vicinity of the project, in excess of standards established in the local general plan, noise ordinance or applicable standards of other agencies.	SU	NI	SU↑	SU↓	SU↓
Impact NOI-3: Excessive Groundborne Vibration or Noise Levels. Construction of the Proposed Project would not result in the potential generation of excessive groundborne vibration or groundborne noise levels.	LS	NI	LS↑	LS↓	LS↓
Impact NOI-4: Cumulative Noise and Vibration Impacts. Construction of the Proposed Project, in combination with past, present, and reasonably foreseeable future development, could result in a significant cumulative impact related to noise; however, construction vibration would not result in significant cumulative impact. Operation of the Proposed Project would also not result in a significant cumulative impact related to noise.	SU	NI	SU↑	SU↓	SU↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
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.	LS	NI	LS↑	LS↓	LS↓
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 that exceeds City and County thresholds (greater than 15% below the regional average VMT).	LS	NI	LS↑	LS↓	LS↓
Impact TRA-3: Geometric Design. Construction and operation of the Proposed Project would not result in substantial increases in hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.	LS	NI	LS↑	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact TRA-4: Emergency Access. Construction and operation of the Proposed Project would not result in inadequate emergency access or impair implementation of or interfere with an emergency evacuation plan.	LS	NI	LS↑	LS↓	LS↓
Impact TRA-5: Cumulative Transportation Impacts. The Proposed Project, in combination with past, present, and reasonably foreseeable future development, would not result in a significant cumulative impact related to transportation	LS	NI	LS↑	LS↓	LS↓
Utilities and Service Systems					
Impact UTL-1: New or Expanded Facilities. The Proposed Project would not result in new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities beyond those proposed as part of the Proposed Project and evaluated throughout the EIR.	NI	NI	NI	NI	NI

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact UTL-2: Water Supplies. Operation of the Proposed Project would provide sufficient water supplies to serve the Proposed Project and would support the provision of sufficient water supplies for reasonably foreseeable future development during normal, dry, and multiple dry years.	B	SU	B	B↓	B
Impact UTL-3: Solid Waste Generation. Construction and operation of the Proposed Project would not generate solid waste in excess or state or local standards, or of the capacity of local infrastructure, or impair attainment of solid waste reduction goals.	LS	NI	LS↑	LS↓	LS↓
Impact UTL-4: Compliance with Solid Waste Regulations. Construction and operation of the Proposed Project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	LS	NI	LS↑	LS↓	LS↓
Impact UTL-5: Cumulative Water and Wastewater 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 water supply and wastewater treatment.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact UTL-6: Cumulative Landfill 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 landfill capacity or related to compliance with solid waste regulations.	LS	NI	LS↑	LS↓	LS↓
Wildfire					
Impact WIL-1: Wildland Fire Exposure. 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.	LS	NI	LS	LS↓	LS↓
Impact WIL-2: Pollutant Concentrations from Wildfire. The Proposed Project would not, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Proposed Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

Table 6-2. Comparison of Impacts from the Alternatives

Environmental Issue	Proposed Project	Alternative 1 No Project	Alternative 2 Alternate Pretreatment Technology	Alternative 3 Reduced Capacity	Alternative 4 No Solids Dewatering
Impact WIL-3: Installation or Maintenance of Infrastructure. The Proposed Project would not 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.	LS	NI	LS	LS↓	LS↓
Impact WIL-4: Runoff, Post-Fire Slope Instability or Drainage Changes. The Proposed Project would not expose people or structures to significant risks, including downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	LS	NI	LS	LS↓	LS↓
Impact WIL-5: 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.	LS	NI	LS	LS↓	LS↓

Notes: B = beneficial impact; NI = no impact; LS = less than significant; LSM = less than significant with mitigation; SU = significant and unavoidable; ↑ = greater; ↓ = lesser.

6.7 References

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Our Water, Our Future